

GLEN ARNOLD

# THE HANDBOOK OF **CORPORATE FINANCE**

A Business Companion to Financial Markets, Decisions and Techniques



# **HANDBOOK OF CORPORATE FINANCE**



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**A business companion to financial markets,  
decisions & techniques**

**Glen Arnold**



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# CONTENTS

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<i>About the author</i>	xiii
<i>Acknowledgments</i>	xiv
<i>Author's Acknowledgments</i>	xv
<i>Introduction</i>	xvi
<b>1 What is the firm's objective?</b>	<b>1</b>
Introduction	2
A common purpose	2
The assumed objective for finance	7
What is shareholder value?	11
Profit maximization is not the same as shareholder wealth-maximization	12
Getting manager's objectives aligned with those of shareholders	15
What happens if control over directors is weak?	19
Conclusion	20
<b>SECTION I: INVESTING IN PROJECTS</b>	
<b>2 State-of-the-art project appraisal techniques</b>	<b>23</b>
Introduction	23
How do you know if an investment generates value for shareholders?	25
State-of-the-art technique 1: net present value	30
State-of-the-art technique 2: internal rate of return	39
Choosing between NPV and IRR	47
Conclusion	49
Appendix 2.1 Mathematical tools for finance	50
<b>3 Traditional appraisal techniques</b>	<b>61</b>
Introduction	62
What appraisal techniques do businesses use?	62
Payback	62
Accounting rate of return	67
Internal rate of return: reasons for continued popularity	70
Conclusion	71

<b>4</b>	<b>Investment decision-making in companies</b>	<b>73</b>
	Introduction	74
	The managerial art of investment selection	75
	More tricky issues in real world project appraisal	82
	The stages of investment decision-making	85
	Conclusion	92
<b>5</b>	<b>Allowing for risk in project appraisal</b>	<b>93</b>
	Introduction	95
	What is risk?	95
	Adjusting for risk through the discount rate	98
	Sensitivity analysis	98
	Scenario analysis	104
	Probability analysis	106
	Problems with using probability analysis	112
	Evidence of risk analysis in practice	113
	Conclusion	113
<b>SECTION II: SHAREHOLDER VALUE</b>		
<b>6</b>	<b>Value managed vs earnings managed companies</b>	<b>117</b>
	Introduction	118
	The pervasiveness of the value approach	118
	Case studies: FT100 companies creating and destroying value	121
	Why shareholder value?	123
	Three steps to value	125
	Earnings-based management's failings	126
	Return on capital employed has failings	133
	Focussing on earnings is not the same as value	134
	How a business creates value	134
	The five actions for creating value	137
	Conclusion	143
<b>7</b>	<b>Value through strategy</b>	<b>145</b>
	Introduction	146
	Value principles touch every corner of the business	146
	The firm's objective	146
	Strategic business unit management	148
	Strategic assessment	150
	Strategic choice	158
	Strategy implementation	159
	What use is the head office?	159
	Targets and motivation	162
	Conclusion	164

<b>8 Measures of value creation</b>	165
Introduction	166
Using cash flow to measure value	166
Shareholder value analysis	172
Economic profit	181
Economic value added	189
Cash flow return on investment	191
Conclusion	191
<b>9 Entire firm value measurement</b>	195
Introduction	196
Total shareholder return	197
Wealth Added Index	200
Market Value Added	204
Market to Book Ratio	208
Conclusion	209
<b>10 What is the company's cost of capital?</b>	211
Introduction	212
A word of warning	212
The required rate of return	213
Two sides of the same coin	214
The weighted average cost of capital	215
The cost of equity capital	221
The cost of retained earnings	232
The cost of debt capital	232
The cost of preference share capital	236
Hybrid securities	236
Calculating the weights	236
The WACC with three or more types of finance	237
Classic error	237
What about short-term debt?	238
Applying the WACC to projects and SBUs	238
What do managers actually do?	239
Implementation issues	243
Which risk-free rate?	245
Fundamental beta	248
Some thoughts on the cost of capital	249
Conclusion	251



<b>11 Mergers: Impulse, regret and success</b>	<b>253</b>
Introduction	254
The merger decision	254
You say acquisition, I say merger	255
Merger statistics	257
What drives firms to merge?	259
Do the shareholders of acquiring firms gain from mergers?	272
Managing mergers	273
Conclusion	284
<b>12 The merger process</b>	<b>287</b>
Introduction	288
The City Code on Takeovers and Mergers	288
Action before the bid	290
The bid	294
After the bid	295
Defense tactics	296
Paying for the target's shares	298
Conclusion	304
<b>13 Valuing companies</b>	<b>307</b>
Introduction	308
The two skills	308
Valuation using net asset value	309
Income flow is the key	314
Dividend valuation methods	314
How do you estimate future growth?	321
Price earnings ratio-to-model	324
Valuation using cash flow	330
Valuing unquoted shares	335
Unusual companies	336
Managerial control changes the valuation	339
Conclusion	345
<b>14 What pay-outs should we make to shareholders?</b>	<b>347</b>
Introduction	348
Defining the problem	348
Theorists in their hypothetical world	349
The other extreme – dividends as a residual	352
What about the world in which we live?	352
Some muddying factors	354
Scrip dividends	360

Share buy-backs and special dividends	360
A round-up of the arguments	361
Conclusion	364

### SECTION III: FINANCE RAISING

<b>15 Debt finance available to firms of all sizes</b>	<b>369</b>
Introduction	370
Contrasting debt finance with equity	371
Bank borrowing	373
Overdraft	376
Term loans	382
Trade credit	382
Factoring	386
Hire purchase	391
Leasing	393
Bills of exchange	399
Acceptance credits (bank bills or banker's acceptance)	401
Conclusion	402
<b>16 Debt finance from the financial markets</b>	<b>403</b>
Introduction	404
Bonds	405
Syndicated loans	409
Credit rating	410
Mezzanine debt and high-yield (junk) bonds	414
Convertible bonds	420
Valuing bonds	424
International sources of debt finance	428
Medium-term notes	441
Commercial paper	442
Project finance	443
Sale and leaseback	445
Securitization	447
Conclusion	448
<b>17 Raising equity capital</b>	<b>451</b>
Introduction	453
What is equity capital?	454
Preference shares	456
Floating on the official list	459
What managers need to consider	460
Methods of issue	466

Timetable for a new offer	468
How does an alternative investment market flotation differ from one on the official list?	473
The costs of new issues	475
Rights issues	479
Other equity issues	482
Scrip issues	484
Warrants	484
Equity finance for unquoted firms	485
Disillusionment and dissatisfaction with quotation	493
Conclusion	495
Appendix 17.1 Arguments for and against floating	496

#### **SECTION IV: MANAGING RISK**

<b>18 The financial risks managers have to deal with</b>	<b>509</b>
Introduction	510
Types of risk	511
Risk in the financial structure	514
The dangers of gearing	521
What do we mean by gearing?	523
Agency costs	534
Pecking order	536
Some further thoughts on debt finance	538
Conclusion	544
<b>19 Options</b>	<b>545</b>
Introduction	546
What is a derivative?	546
A long history	547
What is an option?	547
Share options	548
Index options	558
Corporate uses of options	561
Real options	562
Conclusion	564
<b>20 Using futures, forwards and swaps to manage risk</b>	<b>567</b>
Introduction	568
Futures	568
Short-term interest rate futures	576
Forwards	580
Forward rate agreements	583

A comparison of options, futures and FRAs	584
Caps	584
Swaps	586
Derivatives users	589
Over-the-counter and exchange-traded derivatives	592
Conclusion	593
<b>21 Managing exchange-rate risk</b>	<b>595</b>
Introduction	596
The impact of currency rate changes on the firm	597
Volatility in foreign exchange	598
The currency markets	599
Exchange rates	601
Covering in the forward market	606
Types of foreign-exchange risk	607
Transaction risk strategies	611
Managing translation risk	622
Managing economic risk	625
Conclusion	627
<b>Appendices I–III</b>	<b>629</b>
<b>Glossary</b>	<b>633</b>
<b>Further reading</b>	<b>687</b>
<b>Index</b>	<b>703</b>

To Ben, Sam, Poppy and George

## ABOUT THE AUTHOR

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Glen Arnold, PhD. is a professor of finance (part time) at the University of Salford. He heads a research team focussed on stock market mispricing of shares and the exploitation of that mispricing. His university textbook *Corporate Financial Management* has quickly established its place as the leading UK-based textbook for undergraduates and post-graduates. He also wrote *The Financial Times Guide to Investing*, which provides a comprehensive introduction to investment and the financial markets. The book *Valuegrowth Investing*, describes the approaches of the great investors and synthesizes their insights into a disciplined form of investing.

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# INTRODUCTION

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Managers climbing the corporate ladder find the further they go the more they need to understand the concepts and jargon of finance, both for internal decision making and external interaction with investors, bankers and the City.

It is normally the case that managers have not received any formal training in finance. Furthermore, they are not in a position to take time out from the business to dedicate themselves to study. So what they need is a guide that will allow them to absorb and apply the essential tools of finance while they continue with their executive responsibilities. This book is that guide.

It is designed to be comprehensive, crystal-clear and directed at real world problem solving. It is rigorous without over-burdening the reader. It is not academic in the sense of laboriously expounding theory, but it nevertheless presents state-of-the-art techniques and frameworks, with a focus on managerial action.

The imperatives of day-to-day management mean that all middle and senior executives must have a firm grasp of the fundamental financial issues. These will touch every aspect of the business, ranging from deciding which capital expenditure projects are worthy of backing to managing business units for shareholder value.

**The imperatives of day-to-day management mean that all middle and senior executives must have a firm grasp of the fundamental financial issues.**

Discussion at boardroom level – which inevitably percolates down – is mostly couched in financial terms: what rate of return are we achieving? should we merge? how do we value a company? how do we control foreign exchange rate losses? etc. Because the language of business is largely financial, managers need to understand that language if they want to know what is going on, and to advance. They also need to read the financial pages of broadsheet newspapers to comprehend the wider environment in which the business operates. How can they expect to make senior level decisions without understanding the world around them? Newspapers such as the *Financial Times* assume knowledge of key financial concepts and jargon. This book will help with intelligent reading of these publications.

## Some of the financial issues covered

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- Value-based management is increasingly spoken of, but little understood. This book provides a thorough grounding.
- Mergers and the problem of merger failure (i.e. acquiring shareholders losing out) is discussed along with remedies.

- The proper use of derivatives as tools helping the business control risk, rather than increasing it, is explained in easy-to-follow and practically-oriented fashion.
- Modern investment appraisal techniques are contrasted with the traditional rules of thumb employed by many companies.
- There is an overview of modern financial markets and instruments with insight into the benefits brought by effective exploitation of the markets and perils of ignoring the demands of the finance providers.

## The scope of corporate finance

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To bring the book alive for readers, and to show the mutual reinforcement of practical management and finance theory, there are numerous examples of major UK companies employing the concepts and techniques discussed in each chapter. Much of the ‘real-world’ material is drawn from articles in the *Financial Times*. A typical case is shown in Exhibit I.1 which is used here to highlight the scope of the subject of corporate finance.

There are four key financial issues facing management:

### In what projects are we going to invest our shareholders’ money?

The directors of FlyBE believe that they have a fantastic investment opportunity in low-fare regional flying. Sound financial techniques are needed to make a judgment on whether it is worth committing the large sums required to build up its route network. Furthermore, financial tools will be essential in choosing between the alternative projects of (a) using Boeing aircraft, or (b) replacement of existing fleet with Airbus planes. Connected with the new strategy there will be dozens of smaller investment choices to be made, e.g. is it better to outsource particular operations or undertake the activity in-house? The first section of the book describes proven approaches adopted by all leading corporations in deciding where to concentrate the firm’s financial resources. This class of decisions are sometimes referred to as capital expenditure or ‘capex’.

### How do we create and measure shareholder value creation?

Value creation by a corporation or by individual business units is about much more than deciding whether to invest in specific projects. FlyBE will need to consider a number of strategic implications of its actions, such as: what is the current and likely future return on capital in the industry it is choosing to enter? Will FlyBE have a competitive edge over its rivals in that industry? Value-based management brings together a number of disciplines, such as strategy and resource management,

**Value creation by a corporation or by individual business units is about much more than deciding whether to invest in specific projects.**

## FlyBE negotiates to join the big league

Kevin Done finds the short-haul airline, based at Southampton airport, is preparing to expand into the low-cost market

FlyBE, formerly known as British European, has opened discussions with both Boeing and Airbus on an order for new short-haul aircraft as part of the renewal of its fleet and its ambitious transformation into a UK regional low fares airline.

The group is preparing for a stock market flotation or trade sale during the next three years.

It was built up by Jack Walker, the former steel stockholding millionaire and owner of Blackburn Rovers, and is still privately owned by one of the Walker family trusts.

FlyBE is seeking to build a route network in the provinces to compete with the leading no-frills airlines as it restructures and overcomes two years of heavy losses at the start of the decade.

The negotiations on new aircraft will pitch Boeing against Airbus in the latest of a series of fierce contests between the two aircraft makers in the fast-growing low-cost airline sector.

Jim French, FlyBE managing director, said the group was considering the 148-seat Boeing 737-700 against the 156-seat Airbus A319 to replace its ageing fleet of 15 112- and 98-seat BAe 146s. The group has already ordered 17 Bombardier 78-seat Q400 turbo-prop aircraft for its shorter routes this year. The move from the BAe 146s to Boeing or Airbus aircraft will represent a big jump in both capacity and ambition for FlyBE, and its success will be an important factor in influencing the timing of an initial public offering of the airline.

The Walker family trusts have had to inject £22.5m in fresh capital in the past two years to support the restructuring and provide for the airline's survival.

The airline's total passengers are forecast to rise from 3.9m this year to 4.5m in the year to March 2005, making FlyBE one of the largest independent regional airlines in Europe.

### EXHIBIT I.1 Financial knowledge is crucial for FlyBE success

Source: *Financial Times* 10 December 2003

and draws on the measures developed in the finance field to help judge the extent of value creation from current operations or from new strategic and tactical moves (covered in Chapters 6 to 9). At the center of value-based management is recognition of the need to produce a return on capital devoted to an activity commensurate with the risk. Establishing the minimum required return is the 'cost of capital' issue – the logic behind this calculation is discussed in Chapter 10.

As FlyBE grows it may ponder the possibility of merger with other companies. This is a seductive and potentially treacherous path. To succeed, managerial thought and planning must extend beyond the narrow task of deal making. Chapters 11 and 12 consider the major issues here.

Being able to value business units, companies and shares is a very useful skill. It can help avoid over-paying for an established business. It can also give an insight into how stock market investors value the manager's company. FlyBE is preparing for a possible stock market flotation – managerial knowledge of how to

value its shares could be crucial. Chapter 13 covers the main valuation approaches used today. A further key value decision is how much of the annual profit to keep in the business to support investment and how much to pay out to shareholders. Is a 50:50 split about right? Or, how about keeping just 30 percent in the company and paying the other 70 percent in dividends? This is not an easy decision, but someone has to make it. Chapter 14 outlines the key considerations.

## What type of finance should we raise?

The Walker family have pumped millions of pounds into FlyBE. Founder's capital is a very important source of finance for many firms. Others do not have such wealthy patrons to become established and grow. Fortunately for them the modern financial world presents a wide range of options from selling shares to issuing corporate bonds. The array of choices can be dizzying so the third part of the book provides some order, describing the characteristics of the main forms of finance and their relative advantages and drawbacks. Chapter 15 guides the reader through the benefits and dangers of using bank loans and overdrafts, hire purchase, leasing, trade credit and factoring. Then, we move to the forms of debt finance available to larger firms on the financial markets, from high-yield bonds to convertibles and eurobonds. Jargon is explained and the reader is guided to the selection of the most suitable mixture of finance given the company's circumstances. The final chapter in this section deals with the process of gaining a stock market quotation for a company's shares – a particularly apposite chapter for FlyBE managers. It also describes alternative ways of raising money by selling shares, for example, a rights issue, venture capital or business angel capital.

## How do we manage risk?

FlyBE is faced with many operational risks. Perhaps it will fail to achieve the rise in passenger numbers it projects. Perhaps its new aircraft will be superseded by cheaper, quieter, faster aircraft bought by competitors a couple of years down the line. There are some risks that firms have to accept, including these operational risks. However, there are many others that can be reduced by taking a few simple steps. For example, the risk of a rise in interest rates wiping out profits can be reduced/eliminated in various ways, ranging from choosing a less risky capital structure (proportion of finance from debt and share capital) to the use of interest rate futures on financial markets. Options, forwards and futures can be used to avoid the danger of fuel price rises. The risk that comes from changes in foreign exchange rates can also be controlled through exotic sounding instruments such as swaps, forwards and options. The final section of the book considers the various financial risks managers have to confront and describes how they can be reduced by some simple tactical moves as well as the use of derivatives.

**The final section of the book considers the various financial risks managers have to confront and describes how they can be reduced by some simple tactical moves as well as the use of derivatives.**



# 1

## WHAT IS THE FIRM'S OBJECTIVE?

Introduction

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A common purpose

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The assumed objective for finance

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What is shareholder value?

---

Profit maximization is not the same as  
shareholder wealth-maximization

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Getting manager's objectives aligned  
with those of shareholders

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What happens if control over directors  
is weak?

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Conclusion

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## Introduction

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This chapter considers the most fundamental question facing anyone trying to make decisions within an organization – what is the objective of the business? Without clarity on this point it is very difficult to run a business in a purposeful and effective manner. Unless we know what our objective is we cannot make sensible financial decisions, so it is essential we tackle what at first seems a fairly trivial question early in the book. As you will see the answers to this question are far from easy or trivial. They can be uncomfortable for many managers. They are also vital for the success of the business.

## A common purpose

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Cadbury Schweppes (CS), widely regarded as one of the best-managed companies in the world, has a clear statement of its objective in the 2002 Annual Report – see Case study 1.1. Notice that CS does not confuse the objective with the strategy to be employed to attain the objective. It first states the aim and then states the means to achieve the end. Many firms seem to believe that their *objective* is to operate in a particular market or take particular actions. They seem unable to distinguish market positions or actions from the ultimate purpose of the existence of the organization. This will not only lead to poor strategic decisions but frequently makes intelligent financial decisions impossible.

### Case study 1.1

#### Cadbury Schweppes

**‘Cadbury Schweppes’ governing objective is growth in shareowner value. In pursuit of this the Group’s strategy is to create robust and sustainable regional positions in its core categories of confectionery and beverages...**

....The business process by which the strategy is pursued is Managing for Value (‘MFV’). Introduced into the Group in 1997, MFV is a holistic approach to value creation. It includes setting stretching financial targets; adopting value based management principles in our business processes, both operational and strategic; raising capabilities at all levels of the organisation and aligning management incentive schemes with the interests of shareowners.’ [We consider value-based management in Section II of the book]

Source: Cadbury Schweppes Annual Report and Form 20-F 2002.

This book is about practical decision-making in the real world. When people need to make choices in the harsh environment in which modern businesses have to operate, it is necessary to be clear about the purpose of the organization; to be clear about what objective is set for management to achieve. A multitude of small decisions are made every day; more importantly, every now

and then major strategic commitments of resources are made. It is imperative that the management teams are aware of, respect and contribute to the fundamental objective of the firm in all these large and small decisions. Imagine the chaos and confusion that could result from the opposite situation where there is no clear, accepted objective. The outcome of each decision will frequently conflict with others and the direction of the firm will become random and rudderless. One manager on one occasion will decide to grant long holidays and a shorter working week, believing that the purpose of the institution's existence is to benefit employees; while on another occasion a different manager sacks 'surplus' staff and imposes lower wages, seeing the need to look after the owner's interests as a first priority. So, before we can make decisions in the field of finance we need to establish what it is we are trying to achieve.

**Before we can make decisions in the field of finance we need to establish what it is we are trying to achieve.**

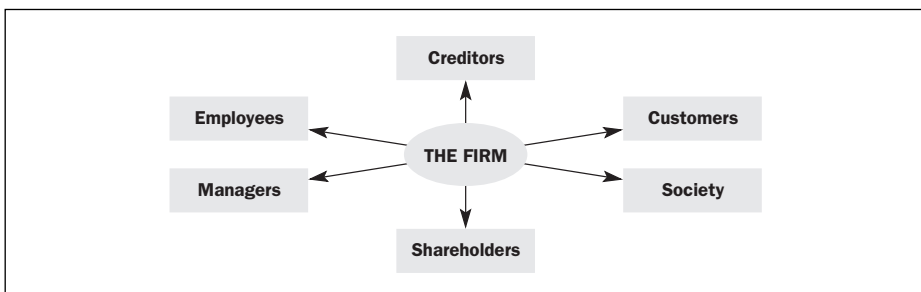
You have probably encountered elsewhere the question, 'In whose interests is the firm run?' This is largely a political and philosophical question and many books have been written on the subject. Here we will provide a brief overview of the debate because of its central importance to making choices in finance. The list of interested parties in Figure 1.1 could be extended, but no doubt you can accept the point from this shortened version that there are a number of claimants on a firm.

### Who gets any surplus?

Sound financial management is necessary for the survival of the firm and for its growth. Therefore all of these stakeholders, to some extent, have an interest in seeing sensible financial decisions being taken. Many business decisions do not involve a conflict between the objectives of each of the stakeholders. However, there are occasions when someone has to decide which claimants are to have their objectives maximized, and which are merely to be satisfied – that is, given just enough of a return to make their contributions. There are some strong views held on this subject:

**FIGURE 1.1**

**A company has responsibilities to a number of interested parties**





- **Shareholder supremacy.** The pro-capitalist economists, such as Friedrich Hayek and Milton Friedman, believe that making shareholders' interests the paramount objective will benefit both the firm and society at large. This approach is not quite as extreme as it sounds because these thinkers generally accept that unbridled pursuit of shareholder returns, to the point of widespread pollution, murder and extortion, will not be in society's best interest and so add the proviso that maximizing shareholder wealth is the desired objective provided that firms remain within 'the rules of the game'.
- **Workers supremacy.** At the opposite end of the political or philosophical spectrum are the left-wing advocates of the primacy of workers' rights and rewards. The belief here is that labor should have its rewards maximized. The employees should have all that is left over, after the other parties have been satisfied. Shareholders are given just enough of a return to provide capital, suppliers are given just enough to supply raw materials and so on.
- **Stakeholder approach.** Standing somewhere in the middle are those keen on a balanced stakeholder approach. Here the (often conflicting) interests of each of the claimants is somehow maximized but within the constraints set by the necessity to compromise to provide a fair return to the other stakeholders.

### **Variety of objectives: those admitted to (and those kept quiet)**

A firm can choose from an infinitely long list of possible objectives. Some of these will appear noble and easily justified, others remain hidden, implicit, embarrassing, even subconscious. The following represent some of the most frequently encountered.

#### **Achieving a target market share**

In some industrial sectors to achieve a high share of the market gives high rewards. These may be in the form of improved profitability, survival chances or status. Quite often the winning of a particular market share is set as an objective because it acts as a proxy for other, more profound objectives, such as generating the maximum returns to shareholders. On other occasions matters can get out of hand and there is an obsessive pursuit of market share with only a thin veneer of shareholder wealth espousement – *see* Exhibit 1.1.

#### **Keeping employee agitation to a minimum**

Here, return to the organization's owners is kept to the minimum level necessary. All surplus resources are directed to mollifying employees. Managers would be very reluctant to admit publicly that they place a high priority on reducing workplace tension, encouraging peace by appeasement and thereby, it is hoped, reducing their own stress levels, but actions tend to speak louder than words. An example of this kind of prioritization was evident in a number of state-owned UK

## Profits fall 39% on scheduled flights

Kevin Done, Aerospace Correspondent

International airlines last year suffered a 39 per cent fall in the net profits of their scheduled services to \$1.9bn, the lowest level for five years, according to the International Air Transport Association (Iata).

Pierre Jeannot, Iata director-general, warned that airlines should 'stop chasing the chimera of endless traffic growth at any price'.

'If governments are no longer going to subsidise such folly,' he said, 'why should we?'

Mr Jeannot warned that most airline strategies continued to be based on market growth and on increasing market share instead of being driven by profits. Airline shareholders should be moved 'to the top of the priority list for rewards'.

### EXHIBIT 1.1 Profits fall on scheduled flights

Source: *Financial Times* 5 April 2000

industries in the 1960s and 1970s. Unemployment levels were low, workers were in a strong bargaining position and there were, generally, state funds available to bail out a loss-making firm. In these circumstances it was easier to buy peace by acquiescing to union demands than to fight on the picket lines. Some companies have tried to reduce workplace tension by giving workers a large proportion of the shares, i.e. making them part-owners. But, as the example of United Airlines shows, 'differences in expectations' can destroy the business. UA ended up with ever more extreme demands from the unions, followed by bankruptcy – see Exhibit 1.2.

### Survival

There are circumstances where the overriding objective becomes the survival of the firm. Severe economic or market shock may force managers to focus purely on short-term issues to ensure the continuance of the business. In fire fighting they pay little attention to long-term growth and return to owners. However this focus is clearly inadequate in the long run – there must be other goals. If survival were the only objective then putting all the firm's cash reserves into a bank savings account might be the best option. When managers say that their objective is survival what they generally mean is the avoidance of large risks that endanger the firm's future. This may lead to a greater aversion to risk, and a rejection of activities that shareholders might wish the firm to undertake. Shareholders are in a position to diversify their investments: if one firm goes bankrupt they may be disappointed but they have other companies' shares to fall back on. However the managers of that one firm may have the majority of their income, prestige and security linked to the continuing existence of that firm. These managers may deliberately avoid high-risk/high-return investments and so deprive the owners of the possibility of large gains.

## United Airlines: the experiment that fell to earth

**The carrier's bankruptcy has raised serious doubts about the viability of workers controlling the companies they work for, write Caroline Daniel and Simon London**

Three months ago the world's second largest airline filed for bankruptcy amid spiralling losses. Last week, after nine years of 55 per cent employee ownership, workers at last dumped enough stock to push their stake below 20 per cent, triggering so-called 'sunset clauses'. The experiment was finally declared dead.

Differences in expectations emerged quickly, says one former employee. 'The silliest of all was when John Edwardson, [then number two] had a meeting with the pilots' union early on and the union said: "Now we are owners, we have the right to fire one officer every year" and John just looked at him and understood it wasn't a joke. It was a tense moment. And he replied: "I suppose then that officers can fire one pilots' union leader every year." Then the light went on.'

Moreover, it was hard to get employees to think like owners. Middle managers in particular were uneasy about giving up precious power. 'We started to say: "We are all owners now, instead of just bosses and employees, so bosses needed to learn quickly how to supervise as coaches, cajolers, advisers – but not with a whip." But some supervisors didn't get it and said: "If I criticise one of my people, and they write to the chief executive, I'll be in trouble." ...

Along with restrictions over which aircraft would fly certain routes, the absurdity of some of the arcane work rules was underscored by the fact that

the pilots' contract included a promise that the company would pick up the tab if a pilot moved city and his piano needed re-tuning, ... employees were given just three out of 12 board seats. But they were also granted the ability to veto chief executives and strategic decisions, such as acquisitions.

Wielding that power required enlightened union leaders. Instead, unions exploited it, denying Mr Edwardson the chief executive's post and later ousting Jim Goodwin, their own appointee, when he warned United would perish without wage cuts.

... Pilots' wages soared an immediate 29 per cent, with 4.5 per cent rises scheduled to follow.

Mr Dubinsky, then head of United's pilots' union, gloated that he intended to choke the golden goose 'by its neck until it gives us every last egg'.

A senior pilot recalls: '... From 2000 to 2002, labour costs rose \$1.4bn (\$886m) but at the same time revenues fell \$5.5.bn.'

The pilot continues: 'The problem was that United was employee-owned but union-controlled. Union leaders needed to satisfy their members who were concerned about work rules and wages, rather than valuation issues. There was a corrupting influence of politics on decision-making ... the equity culture never caught on.'

... the implications of union control over time led to the bleeding of management talent.

### EXHIBIT 1.2

Source: *Financial Times* 18 March 2003

### **Creating an ever-expanding empire**

This is an objective that is rarely openly discussed, but it seems reasonable to propose that some managers drive a firm forward, via organic growth or mergers, because of a desire to run an ever-larger enterprise. Often these motives become clearer with hindsight; when, for instance, a firm meets a calamitous end the *post mortem* often reveals that profit and efficiency were given second place to growth. The volume of sales, number of employees or overall stock market value of the firm have a much closer correlation with senior executive salaries, perks and status than do returns to shareholder funds. This may motivate some individuals to promote growth.

### **Maximization of profit**

This is a much more acceptable objective, although not everyone would agree that maximization of profit should be the firm's purpose.

### **Maximization of long-term shareholder wealth**

While many commentators concentrate on profit maximization, finance experts are aware of a number of drawbacks of profit. The maximization of the returns to shareholders in the long term is considered to be a superior goal. We look at the differences between profit maximization and wealth maximization later.

This list of possible objectives can easily be extended but it is not possible within the scope of this book to examine each of them. Suffice it to say, there can be an enormous variety of objectives and a large potential for conflict and confusion. Some sort of order must be introduced.

## **The assumed objective for finance**

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The company should make investment and financing decisions with the aim of maximizing long-term shareholder wealth.

Throughout the remainder of this book it is assumed that the firm gives primacy of purpose to the wealth of shareholders. This assumption is made mainly on practical grounds, but there are respectable theoretical justifications too.

### **The practical reasons**

If one may assume that the decision-making agents of the firm (managers) are acting in the best interests of shareholders then decisions on such matters as which investment projects to undertake, or which method of financing to use, can be made much more simply. If the firm has a multiplicity of objectives, imagine the

difficulty in deciding whether to introduce a new, more efficient machine to produce the firm's widgets, where the new machine both will be more labor efficient (thereby creating redundancies), and will eliminate the need to buy from one-half of the firm's suppliers. If one focusses solely on the benefits to shareholders a clear decision can be made. This entire book is about decision-making tools to aid those choices. These range from whether to produce a component in-house, to whether to buy another company. If for each decision scenario we have to contemplate a number of different objectives or some vague balance of stakeholder interests, the task is going to be much more complex. Once the basic decision-making frameworks are understood within the tight confines of shareholder wealth maximization, we can allow for complications caused by the modification of this assumption. For instance, shareholder wealth maximization is clearly not the only consideration motivating actions of organizations such as Body Shop or the Co-operative Bank, each with publicly stated ethical principles. Drugs companies are coming under pressure from shareholders to be more generous to AIDS victims – *see* Exhibit 1.3. Just how generous should they be and still be shareholder wealth maximizers? Real-world decision-making can be agonizingly hard.

## Investors warn drugs industry of backlash over health crises

Geoff Dyer

The pharmaceuticals industry could suffer serious damage to its profitability and end up with a reputation similar to that of the tobacco industry if it does not do more to resolve health crises in poor countries, a group of Europe's leading investors will warn today.

The institutional investors will take the unusual step of issuing a statement on how companies should respond to events such as the Aids pandemic. They fear a popular backlash could limit the prices the industry is able to charge in wealthy countries.

The group of investors, which together have £600bn of funds under management, also caution that failure to reach a deal on drug patents in the developing world could harm the industry's reputation.

The statement, sent to 20 leading companies, makes a number of recommendations. It urges them to provide more scope to poorer countries to override drug patents. It also asks them to set prices in different countries that take into account what they can afford and to make more information available to purchasers.

### EXHIBIT 1.3 Investors warn of backlash

Source: *Financial Times* 24 March 2003

## The theoretical reasons

### The risk bearers take the prize

The 'contractual theory' views the firm as a network of contracts, actual and implicit, which specify the roles to be played by various participants in the organization. For instance, the workers make both an explicit (employment contract) and an implicit (show initiative, reliability, etc.) deal with the firm to provide their services in return for salary and other benefits, and suppliers deliver necessary inputs in return for a known payment. Each party has well-defined rights and pay-offs. Most of the participants bargain for a limited risk and a fixed pay-off. Banks, for example, when they lend to a firm, often strenuously try to reduce risk by making sure that the firm is generating sufficient cash flow to repay, that there are assets that can be seized if the loan is not repaid and so on. The bankers' bargain, like that of many of the parties, is a low-risk one and so, the argument goes, they should be rewarded with just the bare minimum for them to provide their service to the firm. Shareholders, on the other hand, are asked to put money into the business at high risk. The deal here is: 'You give us your £10,000 nest egg that you need for your retirement and we, the directors of the firm, do not promise that you will receive a dividend or even see your capital again. We will try our hardest to produce a return on your money but we cannot give any guarantees. Sorry.' Thus the firm's owners are exposed to the possibilities that the firm may go bankrupt and all will be lost. Because of this unfair balance of risk between the different potential claimants on a firm's resources it seems only reasonable that the owners should be entitled to any surplus returns which result after all the other parties have been satisfied.

### Alternatives can be bad for all stakeholders (in the long run)

Another theoretical reason hinges on the practicalities of operating in a free market system. In such a capitalist system, it is argued, if a firm chooses to reduce returns to shareholders because, say, it wishes to direct more of the firm's surplus to the workers, then this firm will find it difficult to survive. Some shareholders will sell their shares and invest in other firms more oriented towards their benefit (United Airlines? Where even the workers sold their shares). In the long run those individuals who do retain their shares may be amenable to a takeover bid from a firm that does concentrate on shareholder wealth creation. The acquirer will anticipate being able to cut costs, not least by lowering the returns to labor. In the absence of a takeover the company would be unable to raise more finance from shareholders and this might result in slow growth and liquidity problems and possibly corporate death, throwing all employees out of work. For over 200 years it has been argued that society is best served by businesses focussing on returns to the owner. Adam Smith (1776) expressed the argument very effectively:

The businessman by directing . . . industry in such a manner as its produce may be of the greatest value, intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good. It is an affectation, indeed, not very common among merchants.

Source: Adam Smith, *The Wealth of Nations*, 1776, p. 400

In an interview in 2003, Milton Friedman focussed on the main benefit of encouraging businesses to pursue high returns for owners. He said that this results in the best allocation of investment capital among competing industries and product lines. 'The self-interest of employees in retaining their jobs will often conflict with this overriding objective.' He went on:

the best system of corporate governance is one that provides the best incentives to use capital efficiently. ... You want control ... in the hands of those who are residual recipients [i.e. shareholders bear the residual risk when a company fails] because they are the ones with the direct interest in using the capital of the firm efficiently.

Source: Simon London, *Financial Times Magazine*, 7 June 2003

### Rights of ownership

One final, and powerful reason for advancing shareholders' interests above all others (subject to the rules of the game) is very simple: they own the firm, and therefore deserve any surplus it produces.

This is not the place to advocate one philosophical approach or another which is applicable to all organizations at all times. Many organizations are clearly not shareholder wealth maximizers and are quite comfortable with that.

**Many organizations are clearly not shareholder wealth maximizers and are quite comfortable with that.**

Charities, government departments and other non-profit organizations are fully justified in emphasizing a different set of values to those espoused by the commercial firm. The reader is asked to be prepared for two levels of thought when using this book. While it

focuses on corporate shareholder wealth decision-making, it may be necessary to make small or large modifications to be able to apply the same frameworks and theories to organizations with different goals.

Football clubs are organizations that often have different objectives from commercial organizations. As Exhibit 1.4 shows, many fans of Newcastle United believe that the objectives of their club changed for the worse when it became a company quoted on the London Stock Exchange. A confusion of objectives can make decision-making complex and suspect.

## It's not all black and white for Newcastle

### Disgruntled fans are blaming the 'plc' for the club's lack of success

Patrick Harverson

At professional football clubs, when things start to go badly wrong on the pitch it is traditional to blame the manager, the chairman, or the board of directors.

Not any more. As more and more clubs have begun to list their shares on the stock market, the 'plc' has slowly emerged as the favoured scapegoat of the disgruntled fans.

Take Newcastle United, a team lying six points above the Premiership's relegation zone after losing five of its last six league games. Despite its precarious position, the club has continued to sell some of its best players, and seems in no hurry to buy any replacements.

Although Kenny Dalglish, the team manager, has been criticised for the club's predicament, most of the blame has been heaped on the publicly quoted company that owns the club, and the institutional shareholders which hold shares in that company.

The fans believe Dalglish has been forced to sell players by the board of the plc, which is under pressure from

City institutions to tighten its financial belt ahead of the planned £42m redevelopment of its St James' Park ground. Consequently, even though a net £12.5m has been raised from player sales in the past 12 months, there is still not enough money available to improve the playing squad.

The fans also think that if the club had remained private and in the hands of its former chairman, Sir John Hall – the local millionaire whose wealth provided the foundation for the club's rebirth in the 1990s – the team would still be buying new players and challenging for the Premiership title.

Mark Edwards of the financial public relations firm Buchanan Communications advises several top clubs. He says: 'When a club announces plans to float, the first thing that comes up in the local press is the question of what happens if there's a choice between paying a dividend to shareholders or buying a player. These sorts of questions are being raised, but they are probably not being answered fully enough by the clubs.'

### EXHIBIT 1.4 It's not all black and white for Newcastle

Source: *Financial Times* 24 January 1998

## What is shareholder value?

Maximizing wealth can be defined as maximizing purchasing power. The way in which an enterprise enables its owners to indulge in the pleasures of purchasing and consumption is by paying them a dividend. The promise of a flow of cash in the form of dividends is what prompts investors to sacrifice immediate consumption and hand over their savings to a management team through the purchase of shares. Shareholders are interested in a flow of dividends over a long time horizon and not necessarily in a quick payback. Take the pharmaceuticals giant GlaxoSmithKline: it could release vast sums for short-term dividend



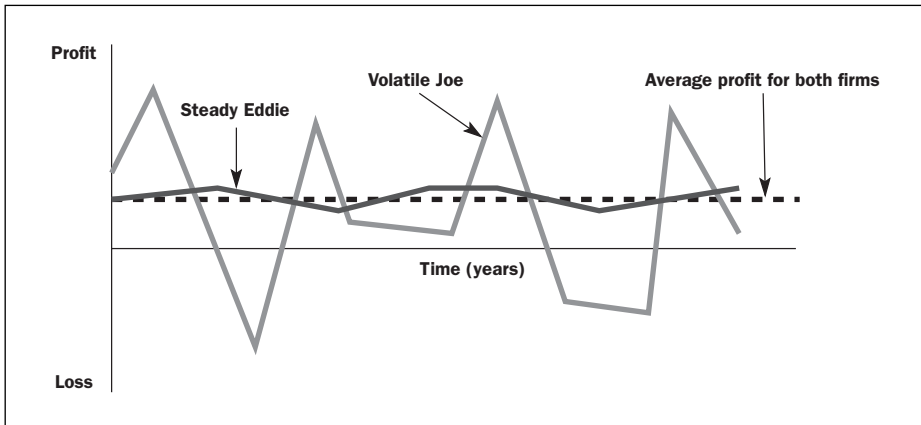
payouts by ceasing all research and development (R&D) and selling off surplus sites. But this would not maximize shareholder wealth because, by retaining funds within the business, it is believed that new products and ideas, springing from the R&D programme, will produce much higher dividends in the future. Maximizing shareholder wealth means maximizing the flow of dividends to shareholders *through time* – there is a long-term perspective.

## Profit maximization is not the same as shareholder wealth-maximization

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Profit is a concept developed by accountants to aid decision-making, one decision being to judge the quality of stewardship shown over the owner's funds. The accountant has to take what is a continuous process, a business activity stretching over many years, and split this into accounting periods of say, a year, or six months. To some extent this exercise is bound to be artificial and fraught with problems. There are many reasons why accounting profit may not be a good proxy for shareholder wealth. Here are five:

- **Prospects** Imagine that there are two firms that have reported identical profits but one firm is more highly valued by its shareholders than the other. One possible reason for this is that recent profit figures fail to reflect the relative potential of the two firms. The stock market will give a higher share value to the company that shows the greater future growth outlook. Perhaps one set of managers chose a short-term approach and raised their profits in the near term but have sacrificed long-term prospects. One way of achieving this is to raise prices and slash marketing spend – over the subsequent year profits might be boosted as customers are unable to switch suppliers immediately. Over the long term, however, competitors will respond and profits will fall.
- **Risk** Again two firms could report identical historic profit figures and have future prospects which indicate that they will produce the same average annual returns. However, one firm's returns are subject to much greater variability and so there will be years of losses and, in a particularly bad year, the possibility of bankruptcy. Figure 1.2 shows two firms with identical average profit, but Volatile Joe's profit is subject to much greater risk than that of Steady Eddie. Shareholders are likely to value the firm with stable income flows more highly than one with high risk.
- **Accounting problems** Drawing up a set of accounts is not as scientific and objective as some people try to make out. There is plenty of scope for judgment, guesswork or even cynical manipulation. Imagine the difficulty facing the company accountant and auditors of a clothes retailer when trying to

**FIGURE 1.2****Two firms with identical average profits but different risk levels**

value a dress which has been on sale for six months. Let us suppose the dress cost the firm £50. Perhaps this should go into the balance sheet and then the profit and loss account will not be affected. But what if the store manager says that he can only sell that dress if it is reduced to £30, and contradicting him the managing director says that if a little more effort was made £40 could be achieved? Which figure is the person who drafts the financial accounts going to take? Profits can vary significantly depending on a multitude of small judgments like this. Another difficult accounting issue is demonstrated in Exhibit 1.5 – just when does a sale add to profits?

## Homestyle quantifies deferral

Maggie Urry

Homestyle, the discount retailer specialising in furniture, beds and soft furnishings, yesterday put a figure of £4.5m on the profit that it said in January would be deferred because of an accounting change. ...

The accounting change affects the timing of profit recognition on furniture sales from the Harveys chain, which was acquired in August 2000.

Previously, profits were booked on order date; that has been changed to delivery date, delaying recognition by several weeks. ...

Since furniture sales peak in the post-Christmas period, the group's current year-end meant these peak deliveries would come into the 2003 year instead. The group now plans to change the financial year-end to April, which it said would be 'more appropriate' to the business.

### EXHIBIT 1.5 When does a sale add to profits?

Source: *Financial Times* 14 March 2002

- **Communication** Investors realize and accept that buying a share is risky. However they like to reduce their uncertainty and nervousness by finding out as much as they can about the firm. If the firm is reluctant to tell shareholders about such matters as the origin of reported profits, then investors generally will tend to avoid those shares. Fears are likely to arise in the minds of poorly informed investors: did the profits come from the most risky activities and might they therefore disappear next year? Is the company being used to run guns to unsavoury regimes abroad? The senior executives of large quoted firms spend a great deal of time explaining their strategies, sources of income and future investment plans to the large institutional shareholders to make sure that these investors are aware of the quality of the firm and its prospects. Firms that ignore the importance of communication and image in the investment community may be doing their shareholders a disservice as the share price might fall. Barclays seems to be aware of its responsibilities in this respect – see Exhibit 1.6.

The London Stock Exchange encourages companies to improve their communication with shareholders – see Exhibit 1.7.

## Barclays to separate its revenue sources

John Copper

Barclays plans to disclose significantly more information about earnings from different operations this year in an effort to improve its stock market valuation.

Mr Martin Taylor, chief executive, intends to publish revenues and costs from operations within investment banking and UK retail banking.

Until now, the bank has only given the overall figures for these divisions.

In its interim results announcement later this summer, the bank is likely to list separately revenues from investment banking, asset management, UK personal retail banking, and small and medium-sized business banking in the UK.

Mr Taylor hopes investors will be able to value the bank's earnings more accurately from these figures. Asset management earnings are relatively high quality because they tend to be more consistent than those in investment banking.

Barclays also hopes that by showing the exact extent of its small business lending it will be able to reassure investors. Three-quarters of its earnings volatility in the past 15 years have come from bad debts on this lending.

A split between personal and small business banking would put Barclays among the leading banks in terms of disclosure.

### EXHIBIT 1.6 More information leads to higher shareholder value ...

Source: *Financial Times* 14 May 1996

## Stock exchange in shareholder relations advice

David Blackwell

The Stock Exchange is today sending every listed small company a guide to improving relations with shareholders.

Its main recommendation is for a Statement of Prospects to be published in the annual report. It also urges companies to explore the internet and other ways of making available information

that will enable potential investors to make value judgments more easily.

The move follows the increasing pressure on small companies as they fall off investors' radar screens. They are becoming less important to institutions that are increasing in size as the financial services industry consolidates.

### EXHIBIT 1.7 Stock exchange in shareholder relations advice

Source: *Financial Times* 8 February 1999

- **Additional capital** Profits can be increased simply by making use of more shareholders' money. If shareholders inject more money into the company or the firm merely retains profits (which belong to shareholders) their future profits can rise, but the return on shareholders' money may fall to less than that which is available elsewhere for the same level of risk. This is shareholder wealth destructive.

## Getting manager's objectives aligned with those of shareholders

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### The problem

In theory the shareholders, being the owners of the firm, control its activities. In practice, the large modern corporation has a very diffuse and fragmented set of shareholders and control often lies in the hands of directors. It is extremely difficult to marshal thousands of shareholders, each with a small stake in the business, to push for change. Thus, in many firms we have what is called a separation, or a divorce, of ownership and control. In times past the directors would usually have been the owners. Today, however, less than 1 percent of the shares of most of the UK's 100 largest quoted firms are owned by the directors.

The separation of ownership and control raises worries that the management team may pursue objectives attractive to them, but which are not necessarily beneficial to the shareholders – this is termed 'managerialism' or 'managementism'. This conflict is an example of the principal–agent problem. The principals (the shareholders) have to find ways of ensuring that their agents (the managers) act in their interests. This means incurring costs, 'agency costs' to: (a) monitor

managers' behavior, and (b) create incentive schemes and controls for managers to encourage the pursuit of shareholders' wealth maximization. These costs arise in addition to the agency cost of the loss of wealth caused by the extent to which prevention measures do not work and managers continue to pursue non-shareholder wealth goals.

### **Some solutions?**

Various methods have been used to try to align the actions of senior management with the interests of shareholders, that is, to achieve 'goal congruence'. These follow:

#### **Linking rewards to shareholder wealth improvements**

A technique widely employed in UK industry is to grant directors and other senior managers share options. These permit managers to purchase shares at some date in the future at a price that is fixed now. If the share price rises significantly between the date when the option was granted and the date when the shares can be bought the manager can make a fortune by buying at the pre-arranged price and then selling in the market-place. For example, in 2004 managers might be granted the right to buy shares in 2007 at a price of £1.50. If the market price moves to say £2.30 in 2007 the managers can buy and then sell the shares, making a gain of 80p. The managers under such a scheme have a clear interest in achieving a rise in share price, so congruence comes about to some extent. However, as Exhibit 1.8 makes clear share (stock) options are not always the best way of motivating employees ('Restricted stock' means the ownership of shares when there are constraints, e.g. the owner cannot sell for a few years).

An alternative method is to allot shares to managers if they achieve certain performance targets, for example, growth in earnings per share or return on assets. In 2003 Luc Vandavelde, chairman of Marks and Spencer, opted to be paid entirely in M&S shares (13,500 shares a month). He will no longer receive pension contributions, nor be eligible for a bonus. He said 'It is a vote of confidence in the team that my remuneration is closely tied to the value which we create for our shareholders' (*Financial Times*, 9 July 2003).

#### **Sackings**

The threat of being sacked with the accompanying humiliation and financial loss may encourage managers not to diverge too far from the shareholders' wealth path. However this method is employed in extreme circumstances only. It is sometimes difficult to implement because of difficulties of making a co-ordinated shareholder effort. However, shareholders really stirred themselves in the case of ITV plc – see Exhibit 1.9.

## Microsoft ends era of worker angst

### Richard Waters on why the software company has put paid to stock option volatility

On Tuesday, Steve Ballmer, chief executive officer, shocked the technology world with the news that Microsoft would no longer hand out stock options.

The legendary Microsoft Millionaires – the secretaries or other middle- and low-level employees who become suddenly wealthy just because they happened to be ‘in the right place at the right time’ – are set to become a thing of the past, says Paula Todd, an executive compensation expert at Towers Perrin.

While the Microsoft switch has been celebrated as a blow for better corporate governance, Mr Ballmer is adamant about the reason for this move: for employees at the world's biggest software company, stock options no longer work.

According to the Microsoft CEO, holding restricted stock simply gives employees ‘a more balanced range of returns’ than holding stock options. The volatility of options, which can make workers rich when share prices soar but leave them with nothing when the stock

market falls, has created too much ‘angst’ in the company. This can be seen from the profits employees have made from their options, at least on paper. From more than \$16bn in 2000, option profits tumbled to under \$5bn last year.

One source of particular anguish for many technology industry workers has been the requirement to pay tax on options profits when they exercise the options, even if they do not sell the stock. For workers who chose to hold their stock, only to see the market collapse, the tax payments became a painful cash drain.

Holding restricted stock rather than options should provide more incentive for workers to keep a stake in the company rather than cashing in their shares, according to Mr Ballmer.

While ensuring that workers have a more direct interest in Microsoft's stock price, though, the shift will reduce the potential for them to become seriously rich.

### EXHIBIT 1.8

Source: *Financial Times* 10 July 2003

## Selling shares and the takeover threat

Over 60 percent of the shares of the typical company quoted on the London Stock Exchange are owned by financial institutions such as pension and insurance funds, who are not prepared to put large resources into monitoring and controlling all the hundreds of firms of which they own a part. Quite often their first response, if they observe that management is not acting in what they regard as their best interest, is to sell the share rather than intervene. This will result in a lower share price, making the raising of funds more difficult. If this process continues the firm may become vulnerable to a merger bid by another group of managers, resulting in a loss of top management posts. Fear of being taken over can establish some sort of back-stop position to prevent shareholder wealth considerations being totally ignored.

## Corporate governance regulations

There is a considerable range of legislation and other regulatory pressures designed to encourage directors to act in shareholders' interests. The

## Carlton: justified ends, cackhanded means

Martin Dickson Lombard

### Appropriate use of shareholder power but ...

Yesterday, Carlton bowed to the inevitable and pledged that an independent outsider, and not Mr Green, would chair ITV when formed out of Carlton and Granada.

The most spectacularly successful investor putsch of recent years will now be followed by endless debate on whether this was an appropriate use of shareholder power or a micro-managing step too far. Lombard's view is that, while the ends were perfectly justified, the means displayed an unfortunate cackhandedness.

The rebels were entirely within their rights to seek to remove Mr Green. Carlton's financial performance has been poor, Mr Green is volatile and

aloof, and there has been a big question mark over his likely working relationship at ITV with his old enemy Charles Allen, designated as chief executive.

Mr Green was to be executive chairman, whereas good governance demands chairmen be both independent and non-executive. ...

... the tactics ... leave a lot to be desired. The best corporate governance involves working through a company's non-executive directors, not holding a gun to their heads as the rebels have done.

Carlton directors claim this came out of the blue. The institutions maintain they had fair warning.

## EXHIBIT 1.9

Source: *Financial Times* 22 October 2003

Companies Acts require certain minimum standards of behaviour, as does the Stock Exchange. There is the back-up of the Serious Fraud Office (SFO) and the financial industry regulators. Following a number of financial scandals guidelines of best practice in corporate governance were issued by the Cadbury, Greenbury, Hampel and Hicks Committees, now consolidated in the Combined Code of Corporate Governance. Directors have to state in the accounts how the principles of the code have been applied. If the principles have not been followed they have to state why. The principles include: transparency on directors' remuneration requiring a remuneration committee consisting mainly of non-executive directors; directors retiring by rotation at least every three years; the chairman should not also be the chief executive officer to avoid domination by one person (in exception circumstances this may be ignored, if a written justification is presented to shareholders); the audit committee (responsible for validating financial figures, e.g. by appointing effective external auditors) should consist mainly of independent (i.e. not a customer or supplier, or a friend of the family or chief executive) non-executive directors and not by executive directors, otherwise the committee would not be able to act as a check and balance to the executive directors; at least half the members of the board, excluding the chairman, should be independent non-executive directors; the accounts must contain a statement by the directors that the company is a going concern, i.e. it will continue for at least one year; a senior independent director should be

appointed to listen to the views of a range of shareholders and communicate those views to the board.

### Information flow

The accounting profession, the Stock Exchange and the investing institutions have conducted a continuous battle to encourage or force firms to release more accurate, timely and detailed information concerning their operations. The quality of corporate accounts and annual reports has generally improved, as has the availability of other forms of information flowing to investors and analysts, such as company briefings and press announcements. This all helps to monitor firms, and identify any wealth-destroying actions by wayward managers early, but as a number of recent scandals have shown, matters are still far from perfect.

## What happens if control over directors is weak?

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In some countries the interests of shareholders are often placed far below those of the controlling managers. In the absence of good corporate governance it is difficult for a firm to obtain funds for expansion – look at the trouble Russian companies are having.

### S&P plans new type of rating for Russian groups

Arkady Ostrovsky in Moscow

Standard & Poor's, the international credit rating agency, will next month launch a product allowing the rating of Russian companies according to corporate governance standards.

Poor standards of corporate governance are among the most pressing issues in the Russian economy, which analysts say slow down foreign and domestic investment and undermine Russian growth.

The new product, whose launch will coincide with the OECD's round table on corporate governance, will rank companies according to their compliance with standards of governance rather than their financial position.

Investors say any instrument allowing measurement of corporate governance risk could be of great value.

The lack of transparency, poor business practices and disrespect for minority shareholders are among the biggest risks for investors in Russia. Last month Norilsk Nickel, one of Russia's largest commodity companies, came under fire from minority shareholders for failing to inform them about the company's restructuring plan and diluting their stakes.

Nick Bradley, director of corporate governance services at S&P, said companies would be evaluated according to four main criteria, including the transparency of the ownership structure, relationship with investors, financial transparency and level of disclosure, and the structure of the board of directors.

Mr Bradley said the service could be paid for by a company itself, or by a foreign investor who is interested in taking a stake in a Russian company.

### Exhibit 1.10 S&P plans new type of rating for Russian groups

Source: *Financial Times* 11 October 2000



## Conclusion

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Readers will agree that all organizations need clarity of purpose. A multiplicity of objectives leads to confusion and contradictory decisions. While the single objective 'shareholder wealth maximization' is controversial and subject to much debate, for the purpose of the decision-making frameworks and techniques discussed in the rest of the book we will take it as *the* objective at all times. This allows much simpler and clearer decisions to be made. At the very least, this has the benefit of allowing easy understanding of financial concepts.

The reader is then free, once the basics of finance are absorbed, to modify the objective to suit the organizational context. However, for most commercial organizations in competitive market environments, you are unlikely to be justified in straying too far from the straight and narrow path of shareholder wealth maximization. Football clubs, building societies, co-ops, charities and government agencies however are a different story.

# SECTION I:

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## INVESTING IN PROJECTS



## STATE-OF-THE-ART PROJECT APPRAISAL TECHNIQUES

Introduction

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How do you know if an investment generates value for shareholders?

---

State-of-the-art technique 1: net present value

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State-of-the-art technique 2: internal rate of return

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Choosing between NPV and IRR

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Conclusion

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Appendix 2.1 Mathematical tools for finance

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## Introduction

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Shareholders supply funds to a firm for a reason. That reason, generally, is to receive a return on their precious resources. The return is generated by management using the finance provided to invest in real assets. It is vital for the health of the firm and the economic welfare of the finance providers that management employ the best techniques available when analyzing which of all the possible investment opportunities will give the best return.

Someone (or a group) within the organization may have to take the bold decision as to whether:

- it is better to build a new factory or extend the old;
- it is wiser to use an empty piece of land for a multi-story car park or to invest a larger sum and build a shopping center;
- whether shareholders would be better off if the firm returned their money in the form of dividends because shareholders can obtain a better return elsewhere; or
- the firm should pursue its expansion plan and invest in that new chain of hotels, or that large car showroom, or the new football stand.

These sorts of decisions require not only brave people, but informed people; individuals of the required caliber need to be informed about a range of issues: for example, the market environment and level of demand for the proposed activity, the internal environment, culture and capabilities of the firm, the types and levels of cost elements in the proposed area of activity, and, of course, an understanding of the risk and uncertainty appertaining to the project.

Cadbury Schweppes presumably considered all these factors before making their multi-million pound investments:

### CADBURY SCHWEPPEES

The 2002 annual report for Cadbury Schweppes shows that the company spent hundreds of millions investing in the business. The report describes the following investments in tangible and intangible assets:

‘Capital expenditure in 2002 was £279m ... The Group continued to implement a major project to standardise business systems and processes (Project PROBE) using a SAP platform. ... The Group also carried out specific projects to increase production capacity

in Mott’s, Schweppes Spain and Cadbury Trebor Bassett. All these projects were funded from internal sources ...’

Total marketing expenditure in 2002 was £547m. The company also spent £53m on major restructuring activities including the integration of Orangina into Schweppes France (£13m), of La Casera into Schweppes Spain (£10m), and Hollywood into Cadbury France (£10m). The group also devoted £32 million to research and development.

### EXHIBIT 2.1 Cadbury Schweppes

Source: Cadbury Schweppes Annual Report and Form 20-F 2002

Bravery, information, knowledge and a sense of proportion are all essential ingredients when undertaking the onerous task of investing other people's money, but there is another element which is also crucial: that is, the employment of an investment appraisal technique which leads to the 'correct' decision; a technique which takes into account the fundamental considerations.

This chapter examines two approaches to evaluating investments within the firm. Both emphasize the central importance of the concept of the time value of money and are thus described as discounted cash flow (DCF) techniques. Net present value (NPV) and internal rate of return (IRR) are in common usage in most large commercial organizations and are regarded as more complete than the traditional techniques of payback and accounting rate of return (e.g. return on capital employed – ROCE). The relative merits and demerits of these alternative methods are discussed in Chapter 3. This chapter concentrates on gaining an understanding of how net present value and internal rate of return are calculated, as well as their theoretical under-pinnings.

## How do you know if an investment generates value for shareholders?

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If we accept that the objective of investment within the firm is to create value for its owners then the purpose of allocating money to a particular division or project is to generate a cash inflow in the future, significantly greater than the amount invested. Put most simply, the project appraisal decision is one involving the comparison of the amount of cash put into an investment with the amount of cash returned. The key phrase and the tricky issue is 'significantly greater than'. For instance, would you, as part-owner of a firm, be content if that firm asked you to swap £10,000 of your hard-earned money for some new shares so that the management team could invest it only to hand back to you, in five years, the £10,000 plus £1,000? Is this a significant return? Would you feel that your wealth had been enhanced if you were aware that by investing the £10,000 yourself, by, for instance, lending to the government, you could have received a 5 percent return per year? Or that you could obtain a return of 15 percent per annum by investing in other shares on the stock market? Naturally, you would feel let down by a management team that offered a return of less than 2 percent per year when you had alternative courses of action that would have produced much more.

**The project appraisal decision is one involving the comparison of the amount of cash put into an investment with the amount of cash returned.**

This line of thought is leading us to a central concept in finance and, indeed, in business generally – the time value of money. Investors have alternative uses for their funds and they therefore have an opportunity cost if money is invested in a corporate project. The *investor's opportunity cost* is the sacrifice of the return available on the best forgone alternative.

**The investor's opportunity cost is the sacrifice of the return available on the best forgone alternative.**

Investments must generate at least enough cash for all investors to obtain their required returns. If they produce less than the investor’s opportunity cost then the wealth of shareholders will decline.

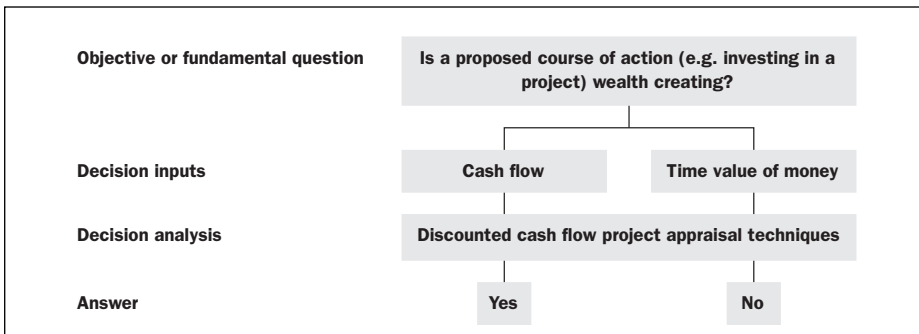
Figure 2.1 summarizes the process of good investment appraisal. The achievement of value or wealth creation is determined not only by the future cash flows to be derived from a project but also by the timing of those cash flows and by making an allowance for the fact that time has value.

**Time is money**

When people undertake to set aside money for investment something has to be given up now. For instance, if someone buys shares in a firm or lends to a business there is a sacrifice of consumption. One of the incentives to save is the possibility of gaining a higher level of future consumption by sacrificing some present consumption. So, some compensation is required to induce people to make a consumption sacrifice. Compensation will be required for at least three things:

- **Time** That is, individuals generally prefer to have £1.00 today than £1.00 in five years’ time. To put this formally: the utility of £1.00 now is greater than £1.00 received five years hence. Individuals are predisposed towards *impatience to consume* – they need an appropriate reward to begin the saving process. The rate of exchange between certain future consumption and certain current consumption is the *pure rate of interest* – this occurs even in a world of no inflation and no risk. If you lived in such a world you might be willing to sacrifice £100 of consumption now if you were compensated with £102.30 to be received in one year. This would mean that your *pure rate of interest* is 2.3 percent.
- **Inflation** The price of time (or the interest rate needed to compensate for time preference) exists even when there is no inflation, simply because people generally prefer consumption now to consumption later. If there is inflation then the providers of finance will have to be compensated for that loss in purchasing power as well as for time.

**FIGURE 2.1**  
Investment appraisal: objective, inputs and process



- **Risk** The promise of the receipt of a sum of money some years hence generally carries with it an element of risk; the pay-out may not take place or the amount may be less than expected. Risk simply means that the future return has a variety of possible values. The issuer of a security, whether it be a share, a bond or a bank account, must be prepared to compensate the investor for time, inflation and risk involved, otherwise no one will be willing to buy the security.

Take the case of Mrs Ann Investor who is considering a £1,000 one-year investment and requires compensation for three elements of time value. First, a return of 2.3 percent is required for the pure time value of money. Second, inflation is anticipated to be 3 percent over the year. Thus, at time zero ( $t_0$ ) £1,000 buys one basket of goods and services. To buy the same basket of goods and services at time  $t_1$  (one year later) £1,030 is needed. To compensate the investor for impatience to consume and inflation the investment needs to generate a return of 5.37 percent, that is:

$$(1 + 0.023)(1 + 0.03) - 1 = 0.0537$$

The figure of 5.37 percent may be regarded here as the risk-free return (RFR), the interest rate that is sufficient to induce investment assuming no uncertainty about the future cash flows.

Investors tend to view lending to reputable governments through the purchase of bonds or bills as the nearest they are going to get to risk-free investing, because these institutions have unlimited ability to raise income from taxes or to create money. The RFR forms the bedrock for time value of money calculations as the pure time value and the expected inflation rate affect all investments equally. Whether the investment is in property, bonds, shares or a factory, if expected inflation rises from 3 to 5 percent, then the investor's required return on all investments will increase by 2 percent.

However, different investment categories carry different degrees of uncertainty about the outcome of the investment. For instance, an investment on the Russian stock market, with its high volatility, may be regarded as more risky than the purchase of a share in AstraZeneca with its steady growth prospects. Investors require different risk premiums on top of the RFR to reflect the perceived level of extra risk. Thus:

$$\begin{array}{l} \text{Required return} \\ \text{(Time value of money)} \end{array} = \text{RFR} + \text{Risk premium}$$

In the case of Mrs Ann Investor, the risk premium pushes up the total return required to, say, 9 percent giving full compensation for all three elements of the time value of money.



## Discounted cash flow

The net present value and internal rate of return techniques discussed in the rest of the chapter, both being discounted cash flow methods, take into account the time value of money. Table 2.1, which presents Project Alpha, suggests that on a straightforward analysis, Project Alpha generates more cash inflows than outflows. An outlay of £2,000 produces £2,400.

**TABLE 2.1**  
**Project Alpha, simple cash flow**

Points in time (yearly intervals)	Cash flows (£)
0 Now	-2,000
1 (1 year from now)	+600
2	+600
3	+600
4	+600

However, we may be foolish to accept Project Alpha on the basis of this crude methodology. The £600 cash flows occur at different times, so are worth different amounts to a person standing at time zero. Quite naturally, such an individual would value the £600 received in one year more highly than the £600 received after four years. In other words, the present value of the pounds (at time zero) depends on when they are received.

It would be useful to convert all these different 'qualities' of pounds to a common currency, to some sort of common denominator. The conversion process is achieved by discounting all future cash flows by the time value of money, thereby expressing them as an equivalent amount received at time zero. The process of discounting relies on a variant of the compounding formula:

$$F = P(1+i)^n$$

where  $F$  = future value

$P$  = present value

$i$  = interest rate

$n$  = number of years over which compounding takes place

Note: Please turn to Appendix 2.1 at this point to get to grips with the key mathematical tools that will be used in this chapter and throughout the rest of the book.

If a saver deposited £100 in a bank account paying interest at 8 percent per annum, after three years the account will contain £125.97:

$$F = 100 (1 + 0.08)^3 = \text{£}125.97$$

This formula can be changed so that we can answer the following question: 'How much must I deposit in the bank now to receive £125.97 in three years?'

$$P = \frac{F}{(1 + i)^n} \quad \text{or} \quad F \times \frac{1}{(1 + i)^n}$$

$$P = \frac{125.97}{(1 + 0.08)^3} = 100$$

In this second case we have *discounted* the £125.97 back to a present value of £100. If this technique is now applied to Project Alpha to convert all the money cash flows of future years into their present value equivalents the result is as follows (assuming that the time value of money is 19 percent).

**TABLE 2.2**  
**Project Alpha, discounted cash flow**

Points in time (yearly intervals)	Cash flows (£)	Discounted cash flows (£)
0	-2,000	-2,000.00
1	+600	$\frac{600}{1 + 0.19} = +504.20$
2	+600	$\frac{600}{(1 + 0.19)^2} = +423.70$
3	+600	$\frac{600}{(1 + 0.19)^3} = +356.05$
4	+600	$\frac{600}{(1 + 0.19)^4} = +299.20$

When these future pounds are converted to a common denominator, this investment involves a larger outflow (£2,000) than inflow (£1,583.15). In other words the return on the £2,000 is less than 19 percent.

### Technical aside

If your calculator has a 'powers' function (usually represented by  $x^y$  or  $y^x$ ) then compounding and discounting can be accomplished relatively quickly. Alternatively, you may obtain discount factors from the table in Appendix II at the end of the book. If we take the discounting of the fourth year's cash flow for Alpha as an illustration:

*Calculator:*

$$\frac{1}{(1 + 0.19)^4} \times 600$$

Input 1.19

Press  $y^x$  (or  $x^y$ )

Input 4

Press =

Display 2.0053

Press  $1/x$

Display 0.4987

Multiply by 600

Answer 299.20.

Using Appendix II, look down the column 19% and along the row 4 years to find discount factor of 0.4987:

$$0.4987 \times 600 = 299.20$$

## State-of-the-art technique 1: net present value

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The conceptual justification for, and the mathematics of, the net present value method of project appraisal will be illustrated through an imaginary but realistic decision-making process at the firm of Hard Decisions plc. This example, in addition to describing the technique, demonstrates the centrality of some key concepts such as opportunity cost and time value of money and shows the wealth-destroying effect of ignoring these issues.

Imagine you are the finance director of a large publicly quoted company called Hard Decisions plc. The board of directors agreed that the objective of the firm should be shareholder wealth maximization. Recently, the board appointed a new director, Mr Brightspark, as an 'ideas' man. He has a reputation as someone who can see opportunities where others see only problems. He has been hired especially to seek out new avenues for expansion and make better use of existing assets. In the past few weeks Mr Brightspark has been looking at some land that the company owns near the center of Birmingham. This is a ten-acre site on which the flagship factory of the firm once stood; but that was

30 years ago and the site is now derelict. Mr Brightspark announces to a board meeting that he has three alternative proposals concerning the ten-acre site.

Mr Brightspark stands up to speak: Proposal 1 is to spend £5m clearing the site, cleaning it up, and decontaminating it. [The factory that stood on the site was used for chemical production.] It would then be possible to sell the ten acres to property developers for a sum of £12m in one year's time. Thus, we will make a profit of £7m over a one-year period.

*Proposal 1: Clean up and sell – Mr Brightspark's figures*

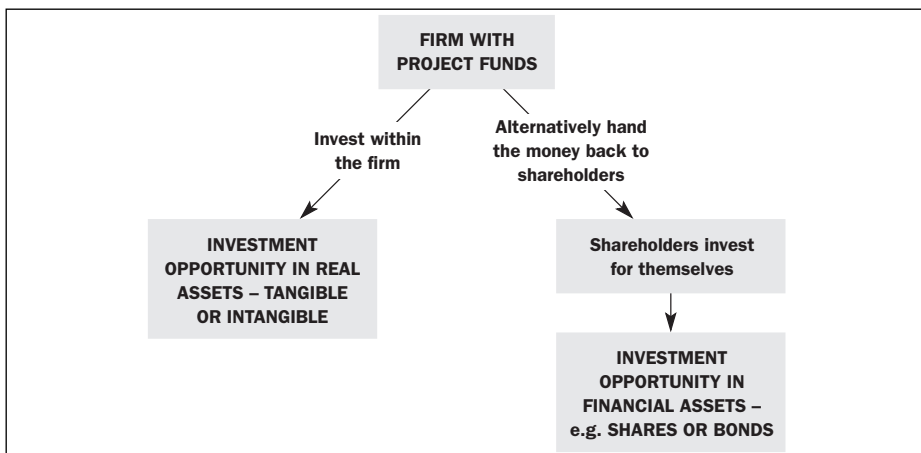
Clearing the site plus decontamination payable, $t_0$	-£5m
Sell the site in one year, $t_1$	<u>£12m</u>
Profit	£7m

The chairman of the board stops Mr Brightspark at that point and turns to you, in your capacity as the financial expert on the board, to ask what you think of the first proposal. Because you have studied your *Handbook of Corporate Finance* assiduously you are able to make the following observations:

- **Point 1** This company is valued by the stock market at £100m because our investors are content that the rate of return they receive from us is consistent with the going rate for our risk class of shares; that is, 15 percent per annum. In other words, the opportunity cost for our shareholders of buying shares in this firm is 15 percent. (Hard Decisions is an all-equity firm, no debt capital has been raised.) The alternative to investing their money with us is to invest it in another firm with similar risk characteristics yielding 15 percent per annum. Thus, we may take this *opportunity cost of capital* as our minimum required return from any project we undertake. This idea of opportunity cost can perhaps be better explained by the use of a diagram (see Figure 2.2).

**FIGURE 2.2**

**The investment decision: alternative uses of firm's funds**



If we give a return of less than 15 percent then shareholders will lose out because they can obtain 15 percent elsewhere, so will suffer an opportunity cost.

We, as managers of shareholders' money, need to use a discount rate of 15 percent for any project of the same risk class that we analyze. The discount rate is the opportunity cost of investing in the project rather than the capital markets, for example, buying shares in other firms giving a 15 percent return. Instead of accepting this project the firm can always give the cash to the shareholders and let them invest it in financial assets.

■ **Point 2** I believe I am right in saying that we have received numerous offers for the ten-acre site over the past year. A reasonable estimate of its immediate sale value would be £6m. That is, I could call up one of the firms keen to get its hands on the site and squeeze out a price of about £6m. This £6m is an opportunity cost of the project, in that it is the value of the best alternative course of action. Thus, we should add to Mr Brightspark's £5m of clean-up costs, the £6m of opportunity cost because we are truly sacrificing £11m to put this proposal into operation. If we did not go ahead with Mr Brightspark's plan, but sold the site as it is, we could raise our bank balance by £6m, plus the £5m saved by not paying clean-up costs.

*Proposal 1: Clean up and sell – Time  $t_0$  cash flows*

Immediate sale value (opportunity cost)	£6m
Clean up, etc.	£5m
Total sacrifice at $t_0$	<u>£11m</u>

■ **Point 3** I can accept Mr Brightspark's final sale price of £12m as being valid in the sense that he has, I know, employed some high quality experts to do the sum, but I do have a problem with comparing the initial outlay *directly* with the final cash flow on a simple *nominal* sum basis. The £12m is to be received in one year's time, whereas the £5m is to be handed over to the clean-up firm immediately, and the £6m opportunity cost sacrifice, by not selling the site, is being made immediately.

If we were to take the £11m initial cost of the project and invest it in financial assets of the same risk class as this firm, giving a return of 15 percent, then the value of that investment at the end of one year would be £12.65m. The calculation for this:

$$F = P (1 + k)$$

where  $k$  = the opportunity cost of capital:

$$11 (1 + 0.15) = £12.65m$$

This is more than the return promised by Mr Brightspark.

Another way of looking at this problem is to calculate the net present value of the project. We start with the classic formula for net present value:

$$\text{NPV} = F_0 + \frac{F_1}{(1 + k)^n}$$

where  $F_0$  = cash flow at time zero ( $t_0$ ), and

$F_1$  = cash flow at time one ( $t_1$ ), one year after time zero

$n$  = number of years from the present for that cash flow – in this case, one:

$$\text{NPV} = -11 + \frac{12}{1 + 0.15} = -11 + 10.43 = -0.56\text{m}$$

All cash flows are expressed in the common currency of pounds at time zero. Everything is in present value terms. When the positives and negatives are netted out we have the *net* present value. The decision rules for net present value are:

$\text{NPV} \geq 0$	Accept
$\text{NPV} < 0$	Reject

*An investment proposal's net present value is derived by discounting the future net cash receipts at a rate which reflects the value of the alternative use of the funds, summing them over the life of the proposal and deducting the initial outlay.*

In conclusion, Ladies and Gentlemen, given the choice between:

- (a) selling the site immediately raising £6m and saving £5m of expenditure – a total of £11m, or
- (b) developing the site along the lines of Mr Brightspark's proposal,

I would choose to sell it immediately because £11m would get a better return elsewhere.

The chairman thanks you and asks Mr Brightspark to explain Project Proposal 2. Proposal 2 consists of paying £5m immediately for a clean-up. Then, over the next two years, spending another £14m building an office complex. Tenants would not be found immediately on completion of the building. The office units would be let gradually over the following three years. Finally, when the office complex is fully let, in six years' time, it would be sold to an institution, such as a pension fund, for the sum of £40m (*see* Table 2.3).

Mr Brightspark claims an almost doubling of the money invested (£25m invested over the first two years leads to an inflow of £47m). The chairman turns to you and asks: Is this project really so beneficial to our shareholders?

TABLE 2.3

**Proposal 2: Office complex – Mr Brightspark's figures**

Points in time (yearly intervals)	Cash flows (£m)	Event
0 (now)	-5	Clean-up costs
0 (now)	-6	Opportunity cost
1	-4	Building cost
2	-10	Building cost
3	+1	Net rental income, $\frac{1}{4}$ of offices let
4	+2	Net rental income, $\frac{1}{2}$ of offices let
5	+4	Net rental income, all offices let
6	+40	Office complex sold
TOTAL	+22	Inflow £47m Outflow £25m
PROFIT	22	

(Note: Mr Brightspark has accepted the validity of your argument about the opportunity cost of the alternative 'project' of selling the land immediately and has quickly added this -£6m to the figures.)

You reply: The message rammed home to me by my finance book was that the best method of assessing whether a project is shareholder wealth enhancing is to discount all its cash flows at the opportunity cost of capital. This will enable a calculation of the net present value of those cash flows.

$$NPV = F_0 + \frac{F_1}{1+k} + \frac{F_2}{(1+k)^2} + \frac{F_3}{(1+k)^3} \dots + \frac{F_n}{(1+k)^n}$$

So, given that Mr Brightspark's figures are true cash flows, I can calculate the NPV of Proposal 2 – see Table 2.4.

Because the NPV is less than 0, we would serve our shareholders better by selling the site and saving the money spent on clearing and building and putting that money into financial assets yielding 15 percent per annum. Shareholders would end up with more in Year 6.

The chairman thanks you and asks Mr Brightspark for his third proposal. Proposal 3 involves the use of the site for a factory to manufacture the product 'Worldbeater'. Mr Brightspark says we have been producing 'Worldbeater' from our Liverpool factory for the past ten years. Despite its name, we have confined the selling of it to the UK market. I propose the setting up of a second 'Worldbeater' factory which will serve the European market. The figures are as follows (see Table 2.5).

**TABLE 2.4**  
**Proposal 2: Net present values**

Points in time (yearly intervals)	Cash flows (£m)		Discounted cash flows (£m)
0	-5		-5
0	-6		-6
1	-4	$\frac{-4}{(1 + 0.15)}$	-3.48
2	-10	$\frac{-10}{(1 + 0.15)^2}$	-7.56
3	1	$\frac{1}{(1 + 0.15)^3}$	0.66
4	2	$\frac{2}{(1 + 0.15)^4}$	1.14
5	4	$\frac{4}{(1 + 0.15)^5}$	1.99
6	40	$\frac{40}{(1 + 0.15)^6}$	17.29
<b>Net present value</b>			<b>-0.96</b>

**TABLE 2.5**  
**Manufacture of 'Worldbeater' – Mr Brightspark's figures**

Points in time (yearly intervals)	Cash flows (£m)	Event
0	-5	Clean-up
0	-6	Opportunity cost
1	-10	Factory building
2	0	Net cash flows from operating
3 to infinity	+5	Net cash flows from additional sales of 'Worldbeater'

*Note:* Revenue is gained in Year 2 from sales but this is exactly offset by the cash flows created by the costs of production and distribution. The figures for Year 3 and all subsequent years are net cash flows, that is, cash outflows are subtracted from cash inflows generated by sales.



The chairman turns to you and asks your advice.

You reply: Worldbeater is a well-established product and has been very successful. I am happy to take the cash flow figures given by Mr Brightspark as the basis for my calculations, which are as follows (*see* Table 2.6).

**TABLE 2.6**  
**Worldbeater Net Present Value**

Points in time (yearly intervals)	Cash flows (£m)		Discounted cash flows (£m)
0	-11		-11
1	-10	$\frac{-10}{(1 + 0.15)}$	-8.7
2	0		
3 to infinity	5	Value of perpetuity at time $t_2$ : $P = \frac{F}{k} = \frac{5}{0.15} = 33.33.$ This 33.33 has to be discounted back two years: $\frac{33.33}{(1 + 0.15)^2}$	= 25.20
Net present value			+ 5.5

*Note:* The perpetuity formula can be used on the assumption that the first payment arises one year from the time at which we are valuing. So, if the first inflow arises at time 3 we are valuing the perpetuity as though we are standing at time 2. The objective of this exercise is not to convert all cash flows to time 2 values, but rather to time 0 value. Therefore, it is necessary to discount the perpetuity value by two years. (If these calculations are confusing you are advised to read the mathematical Appendix 2.1 at the end of this chapter.)

This project gives an NPV that is positive, so is shareholder wealth enhancing because it gives a rate of return that is greater than 15 percent per annum. It provides a return of 15 percent plus a present value of £5.5m. Based on these figures I would recommend that the board examine Proposal 3 in more detail.

The chairman thanks you and suggests that this proposal be put to the vote.

Mr Brightspark (interrupts): Just a minute, are we not taking a lot on trust here? Our finance expert has stated that the way to evaluate these proposals is by using the NPV method, but in the firms where I have worked in the past, the internal rate of return (IRR) method of investment appraisal was used. I would like to see how these three proposals shape up when the IRR calculations are done.

The chairman turns to you and asks you to explain the IRR method, and to apply it to the figures provided by Mr Brightspark ...

Before continuing this boardroom drama it might be useful at this point to broaden the understanding of NPV by considering two worked examples.

### Worked example 2.1 CAMRAT PLC

Camrat plc requires a return on investment of at least 10% per annum over the life of a project to meet the opportunity cost of its shareholders (Camrat is financed entirely by equity). The dynamic and thrusting strategic development team have been examining the possibility of entering the new market area of mosaic floor tiles. This will require an immediate outlay of £1m for factory purchase and tooling-up which will be followed by *net* (i.e. after all cash outflows (wages, variable costs, etc.)) cash inflows of £0.2m in one year, and £0.3m in two years' time. Thereafter, annual net cash inflows will be £180,000.

#### *Required*

Given these cash flows, will this investment provide a 10% return (per annum) over the life of the project? Assume for simplicity that all cash flows arise on anniversary dates.

#### *Answer*

**First**, lay out the cash flows with precise timing. (Note: the assumption that all cash flows arise on anniversary dates allows us to do this very simply.)

Points in time (yearly intervals)	0	1	2	3 to infinity
Cash flows (£)	-1m	0.2m	0.3m	0.18m

**Second**, discount these cash flows to their present value equivalents.

Points in time	0	1	2	3 to infinity
$F_0$		$\frac{F_1}{1+k}$	$\frac{F_2}{(1+k)^2}$	$\frac{F_3}{k} \times \frac{1}{(1+k)^2}$
-1m		$\frac{0.2}{1+0.1}$	$\frac{0.3}{(1+0.1)^2}$	$\frac{0.18}{0.1}$
				This discounts back two years: $\frac{0.18/0.1}{(1+0.1)^2}$
-1m	0.1818	0.2479	$\frac{1.8}{(1.1)^2} = 1.4876$	

**Third**, net out the discounted cash flows to give the net present value.

	-1.0000
	+0.1818
	+0.2479
	<u>+1.4876</u>
Net present value	<u>+0.9173</u>

### Conclusion

The positive NPV result demonstrates that this project gives not only a return of 10% per annum but a large surplus above and beyond a 10% per annum return. This is an extremely attractive project: on a £1m investment the surplus generated beyond the opportunity cost of the shareholders (their time value of money) is £917,300; by accepting this project we would increase shareholder wealth by this amount.

## Worked example 2.2

### ACTARM PLC

Actarm plc is examining two projects, A and B. The cash flows are as follows:

	A £	B £
Initial outflow, $t_0$	240,000	240,000
Cash inflows:		
Time 1 (one year after $t_0$ )	200,000	20,000
Time 2	100,000	120,000
Time 3	20,000	220,000

Using discount rates of 8%, and then 16%, calculate the NPVs and state which project is superior. Why do you get a different preference depending on the discount rate used?

*Answer*

*Using 8% as the discount rate:*

$$NPV = F_0 + \frac{F_1}{1+k} + \frac{F_2}{(1+k)^2} + \frac{F_3}{(1+k)^3}$$

*Project A*

$$-240,000 + \frac{200,000}{1+0.08} + \frac{100,000}{(1+0.08)^2} + \frac{20,000}{(1+0.08)^3}$$

$$\mathbf{-240,000 + 185,185 + 85,734 + 15,877 = + \pounds 46,796}$$

*Project B*

$$-240,000 + \frac{20,000}{1 + 0.08} + \frac{120,000}{(1 + 0.08)^2} + \frac{220,000}{(1 + 0.08)^3}$$

$$\mathbf{-240,000 + 18,519 + 102,881 + 174,643 = +\pounds56,043}$$

Using an 8% discount rate, both projects produce positive NPVs so would enhance shareholder wealth. However, Project B is superior because it creates more value than Project A. If accepting one project excludes the possibility of accepting the other, then B is preferred.

*Using 16% as the discount rate:*

*Project A*

$$-240,000 + \frac{200,000}{1.16} + \frac{100,000}{(1.16)^2} + \frac{20,000}{(1.16)^3}$$

$$\mathbf{-240,000 + 172,414 + 74,316 + 12,813 = +\pounds19,543}$$

*Project B*

$$-240,000 + \frac{20,000}{1.16} + \frac{120,000}{(1.16)^2} + \frac{220,000}{(1.16)^3}$$

$$\mathbf{-240,000 + 17,241 + 89,180 + 140,945 = +\pounds7,366}$$

With a 16% discount rate Project A generates more shareholder value and so would be preferred to Project B. This is despite the fact that Project B, in pure undiscounted cash flow terms, produces an additional £40,000.

The different ranking (order of superiority) occurs because Project B has the bulk of its cash flows occurring towards the end of the project's life. These large distant cash flows, when discounted at a high discount rate, become relatively small compared with those of Project A, which has its high cash flows discounted by only one year. Obtaining the appropriate discount rate to use in calculations of this kind is discussed in Chapter 10.

## State-of-the-art technique 2: internal rate of return

---

We now return to Hard Decisions plc. The chairman has asked you to explain internal rate of return (IRR).

You respond: The internal rate of return is a very popular method of project appraisal and it has much to commend it. In particular it takes into account the time value of money. I am not surprised to find that Mr Brightspark has encountered this appraisal technique in his previous employment. Basically, what the IRR tells you is the rate of interest you will receive by putting your money into a project. It describes by how much the cash inflows exceed the cash outflows on an annualized percentage basis, taking account of the timing of those cash flows.

The internal rate of return is the rate of return,  $r$ , that equates the present value of future cash flows with the outlay (or, for some projects, it equates discounted future cash outflows with initial inflow):

**Outlay = Future cash flows discounted at rate  $r$**

Thus:

$$F_0 = \frac{F_1}{1+r} + \frac{F_2}{(1+r)^2} + \frac{F_3}{(1+r)^3} \dots \frac{F_n}{(1+r)^n}$$

IRR is also referred to as the 'yield' of a project.

Alternatively, the internal rate of return,  $r$ , is the discount rate at which the net present value is zero. It is the value for  $r$  that makes the following equation hold:

$$F_0 + \frac{F_1}{1+r} + \frac{F_2}{(1+r)^2} + \frac{F_3}{(1+r)^3} \dots \frac{F_n}{(1+r)^n} = 0$$

(*Note:* in the first formula  $F_0$  is expressed as a positive number, whereas in the second it is usually a negative.)

These two equations amount to the same thing. They both require knowledge of the cash flows and their precise timing. The element that is unknown is the rate of interest that will make the time-adjusted outflows and inflows equal to each other.

I apologize, ladies and gentlemen, if this all sounds like too much jargon. Perhaps it would be helpful if you could see the IRR calculation in action. Let's apply the formula to Mr Brightspark's Proposal 1.

### **Proposal 1: Internal rate of return**

Using the second version of the formula, our objective is to find an  $r$  that makes the discounted inflow at time 1 of £12m plus the initial £11m outflow equal to zero:

$$F_0 + \frac{F_1}{1+r} = 0$$

$$-11 + \frac{12}{1+r} = 0$$

The method I would recommend for establishing  $r$  is trial and error (assuming we do not have the relevant computer program available). So, to start with, simply pick an interest rate and plug it into the formula. Let's try 5 percent:

$$-11 + \frac{12}{1+0.05} = \pounds 0.42857\text{m or } \pounds 428,571$$

A 5 percent rate is not correct because the discounted cash flows do not total to zero. The surplus of approximately £0.43m suggests that a higher interest rate will be more suitable. This will reduce the present value of the future cash inflow. Let's try 10 percent:

$$-11 + \frac{12}{1 + 0.1} = -\pounds 0.0909 \text{ or } -\pounds 90,909$$

Again, we have not hit on the correct discount rate. Let's try 9 percent:

$$-11 + \frac{12}{1 + 0.09} = +\pounds 0.009174 \text{ or } +\pounds 9,174$$

The last two calculations tell us that the interest rate that equates to the present value of the cash flows lies somewhere between 9 and 10 percent. The precise rate can be found through interpolation.

First, display all the facts so far established:

Discount rate, $r$	9%	?	10%
Net present value	+£9,174	0	-£90,909
Point	A	B	C

There is a yield rate ( $r$ ) that lies between 9 and 10 percent that will produce an NPV of zero. The way to find that interest rate is to first find the distance between points A and B, as a proportion of the entire distance between points A and C.

$$\frac{A \rightarrow B}{A \rightarrow C} = \frac{9,174 - 0}{9,174 + 90,909} = 0.0917$$

The ? lies at a distance of 0.0917 away from the 9 percent point.  
IRR:

$$= 9 + \left( \frac{9,174}{100,083} \right) \times (10 - 9) = 9.0917 \text{ percent}$$

To double-check our result:

$$\begin{aligned} & -11 + \frac{12}{1 + 0.090917} \\ & -11 + 11 = 0 \end{aligned}$$

## The IRR decision rules

The rule for internal rate of return decisions is:

- **If  $k > r$  reject** If the opportunity cost of capital ( $k$ ) is greater than the internal rate of return ( $r$ ) on a project then the investor is better served by not going ahead with the project and applying the money to the best alternative use.

- **If  $k \leq r$  accept** Here, the project under consideration produces the same or a higher yield than investment elsewhere for a similar risk level.

The IRR of Proposal 1 is 9.091 percent, which is below the 15 percent opportunity cost of capital used by Hard Decisions plc. Using the IRR method as well as the NPV method, this project should be rejected.

It might be enlightening to consider the relationship between NPV and IRR. Table 2.7 shows what happens to NPV as the discount rate is varied between zero and 10 percent for Proposal 1. At a zero discount rate the £12m received in one year is not discounted at all, so the NPV of £1m is simply the difference between the two cash flows. When the discount rate is raised to 10 percent the present value of the Year 1 cash flow becomes less than the current outlay. Where the initial outflow equals the *discounted* future inflows, i.e. when NPV is zero, we can read off the internal rate of return.

**TABLE 2.7**

**The relationship between NPV and the discount rate (using Proposal 1's figures)**

Discount rate (%)	NPV
10	-90,909
9.0917	0
9	9,174
8	111,111
7	214,953
6	320,755
5	428,571
4	538,461
3	650,485
2	764,706
1	881,188
0	1,000,000

### Proposal 2: IRR

To calculate the IRR for Proposal 2 we first lay out the cash flows in the discount formula:

$$-11 + \frac{-4}{(1+r)} + \frac{-10}{(1+r)^2} + \frac{1}{(1+r)^3} + \frac{2}{(1+r)^4} + \frac{4}{(1+r)^5} + \frac{40}{(1+r)^6} = 0$$

Then we try alternative discount rates to find a rate,  $r$ , that gives a zero NPV:

Try 14 per cent:

NPV (approx.) = -£0.043 or -£43,000

At 13 per cent:

NPV = £932,000

Interpolation is required to find an internal rate of return accurate to at least one decimal place:

Discount rate			
$r$	13%	?	14%
NPV	+932,000	0	-43,000

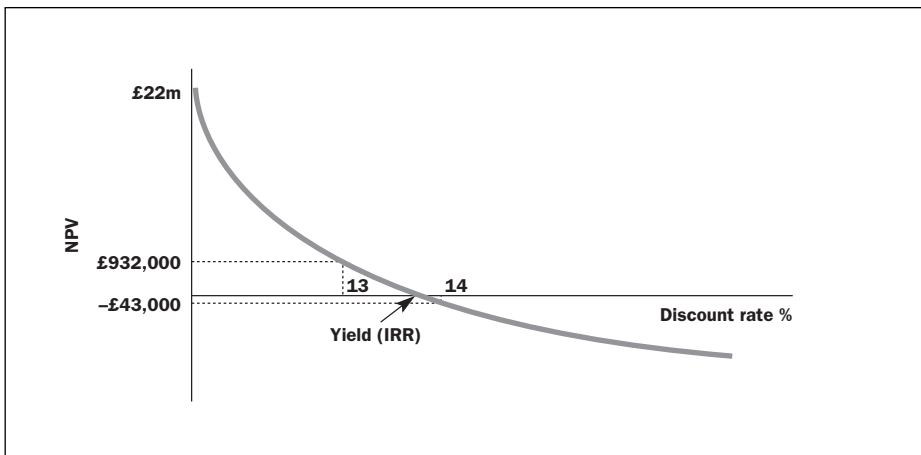
$$13 + \frac{932,000}{975,000} \times (14 - 13) = 13.96\%$$

This project produces an IRR (13.96%), which is less than the opportunity cost of shareholders' funds (15%); so it should be rejected under the IRR method. Because the line in Figure 2.3 is curved, it is important to have only a fairly small gap in trial and error interest rates prior to interpolation. The interpolation formula assumes a straight line between the two discount rates chosen. The effect of taking a wide range of interest rates can be illustrated if we calculate on the basis of 5 and 30 percent.

At 5%, NPV of Project 2 = £11.6121m.

At 30%, NPV of Project 2 = -£9.4743m.

**FIGURE 2.3**  
Graph of NPV for Proposal 2





*Linear interpolation*

Discount rate

$r$	5%	?	30%
NPV	+11.6121	0	-9.4743

$$5 + \left( \frac{11.6121}{11.6121 + 9.4743} \right) (30 - 5) = 18.77\%$$

The non-linearity of the relationship between NPV and the discount rate has created an IRR almost 5 percent removed from the true IRR – see Figure 2.4. This could lead to an erroneous acceptance of this project given the company's hurdle rate of 15 percent. In reality this project yields less than the company could earn by placing its money elsewhere for the same risk level.

**Proposal 3: IRR**

$$F_0 + \frac{F_1}{1+r} + \frac{F_3/r}{(1+r)^2} = 0$$

Try 19 percent:

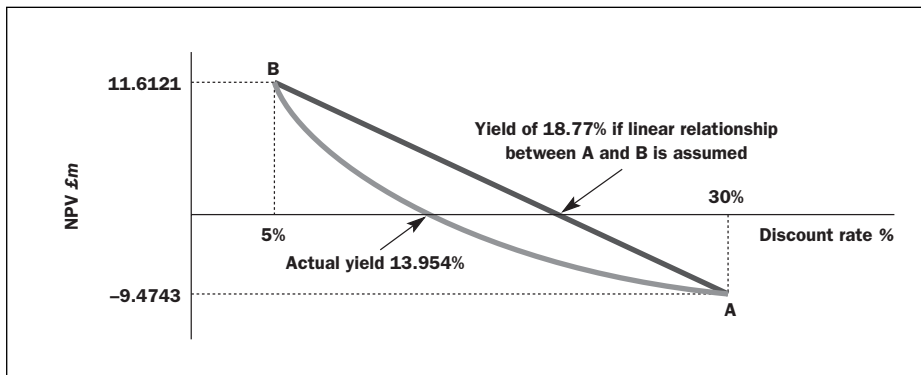
$$-11 + \frac{-10}{1+0.19} + \frac{5/0.19}{(1+0.19)^2} = -\pounds 0.82\text{m}$$

Try 18 percent:

$$-11 + \frac{-10}{1+0.18} + \frac{5/0.18}{(1+0.18)^2} = +\pounds 0.475\text{m}$$

**FIGURE 2.4**

The accuracy of the IRR may depend on the size of the gap between the discount rates used in the interpolation calculation



*Linear Interpolation:*

<i>r</i>	18%	?	19%
NPV	+475,000	0	-820,000

$$18 + \frac{475,000}{1,295,000} \times (19 - 18) = 18.37\%$$

Project 3 produces an internal rate of return of 18.37 percent which is higher than the opportunity cost of capital and therefore is to be commended.

We temporarily leave the saga of Mr Brightspark and his proposals to reinforce understanding of NPV and IRR through the worked example of Martac plc.

### Worked example 2.3

#### MARTAC PLC

Martac plc is a manufacturer of *Martac-aphro*. Two new automated process machines used in the production of Martac have been introduced to the market, the CAM and the ATR. Both will give cost savings over existing processes:

	CAM £000s	ATR £000s
<i>Initial cost</i> (machine purchase and installation, etc.)	120	250
<i>Cash flow savings:</i>		
At Time 1 (one year after the initial cash outflow)	48	90
At Time 2	48	90
At Time 3	48	90
At Time 4	48	90

All other factors remain constant and the firm has access to large amounts of capital. The required return on projects is 8%.

#### Required:

- (a) Calculate the IRR for CAM.
- (b) Calculate the IRR for ATR.
- (c) Based on IRR which machine would you purchase?
- (d) Calculate the NPV for each machine.
- (e) Based on NPV which machine would you buy?
- (f) Is IRR or NPV the better decision tool?

**Answers**

In this problem the total cash flows associated with the alternative projects are not given. Instead the incremental cash flows are provided, for example, the additional savings available over the existing costs of production. This, however, is sufficient for a decision to be made about which machine to purchase.

**(a) IRR for CAM**

$$F_0 + \frac{F_1}{1+r} + \frac{F_2}{(1+r)^2} + \frac{F_3}{(1+r)^3} + \frac{F_4}{(1+r)^4} = 0$$

Try 22%:

$$-120,000 + 48,000 \times \text{annuity factor (af) for 4 years @ 22\%}$$

(See Appendix 2.1 (p. 55) for annuity calculations and Appendix III (p. 631) for an annuity table.)

The annuity factor tells us the present value of four lots of £1 received at four annual intervals. This is 2.4936, meaning that the £4 in present value terms is worth just over £2.49.

$$-120,000 + 48,000 \times 2.4936 = -\pounds 307.20$$

Try 21%:

$$-120,000 + 48,000 \times \text{annuity factor (af) for 4 years @ 21\%}$$

$$-120,000 + 48,000 \times 2.5404 = +\pounds 1,939.20$$

*Interpolation*

Discount rate

	21%	?	22%
NPV	1,939.2	0	-307

$$21 + \left( \frac{1939.2}{1939.2 + 307} \right) (22 - 21) = 21.86\%$$

**(b) IRR for ATR**

Try 16%:

$$-250,000 + 90,000 \times 2.7982 = +\pounds 1,838$$

Try 17%:

$$-250,000 + 90,000 \times 2.7432 = -\pounds 3,112$$

Discount rate, $r$	16%	?	17%
	-----		
NPV	+1,838	0	-3,112

$$16 + \left( \frac{1,838}{1,838 + 3,112} \right) \times (17-16) = 16.37\%$$

**(c) Choice of machine on basis of IRR**

If IRR is the only decision tool available then as long as the IRRs exceed the discount rate (or cost of capital) the project with the higher IRR might appear to be the preferred choice. In this case CAM ranks higher than ATR.

**(d) NPV for machines: CAM**

$$-120,000 + 48,000 \times 3.3121 = +\pounds 38,981$$

**NPV for ATR**

$$-250,000 + 90,000 \times 3.3121 = +\pounds 48,089$$

**(e) Choice of machine on basis of NPV**

ATR generates a return which has a present value of  $\pounds 48,089$  in addition to the minimum return on capital required. This is larger than for CAM and therefore ATR ranks higher than CAM if NPV is used as the decision tool.

**(f) Choice of decision tool**

This problem has produced conflicting decision outcomes, which depend on the project appraisal method employed. NPV is the better decision-making technique because it measures in absolute amounts of money. That is, it gives the increase in shareholder wealth available by accepting a project. In contrast, IRR expresses its return as a percentage which may result in an inferior low-scale project being preferred to a higher-scale project. So, if you cannot undertake both projects the one that returns most to shareholders is the one with the highest NPV rather than the highest IRR

## Choosing between NPV and IRR

---

We now return to Hard Decisions plc.

Mr Brightspark: I have noticed your tendency to prefer NPV to any other method. Yet, in the three projects we have been discussing, NPV and IRR give the same decision recommendation. That is, reject Projects 1 and 2, and accept Project 3. So, why not use IRR more often?

You reply: It is true that the NPV and IRR methods of capital investment appraisal are closely related. Both are ‘time-adjusted’ measures of profitability. The NPV and IRR methods gave the same result in the cases we have considered today because the problems associated with the IRR method are not present in the figures we have been working with. In the appraisal of other projects we may encounter the severe limitations of the IRR method and therefore I prefer to stick to the theoretically superior NPV technique.

I will illustrate two of the most important problems, multiple solutions and ranking.

## Multiple solutions

There may be a number of possible IRRs. This can be explained by examining the problems Mr Flummoxed is having (*see* Worked example 2.4).

### Worked example 2.4 MR FLUMMOXED

Mr Flummoxed of Deadhead plc has always used the IRR method of project appraisal. He has started to have doubts about its usefulness after examining the proposal for ‘Project Oscillation’.

#### *Project oscillation*

Points in time (yearly intervals)	0	1	2
Cash flow	-3,000	+15,000	-13,000

Internal rates of return are found at 11.56% and 288.4%.

Given that Deadhead plc has a required rate of return of 20%, it is impossible to decide whether to implement Project Oscillation using an unadjusted IRR methodology.

The cause of multiple solutions is unconventional cash flows. Conventional cash flows occur when an outflow is followed by a series of inflows or a cash inflow is followed by a series of cash outflows. Unconventional cash flows are a series of cash flows with more than one change in sign. In the case of Project Oscillation the sign changes from negative to positive once, and from positive to negative once. These two sign changes provide a clue to the number of possible solutions or IRRs. Multiple yields can be adjusted for while still using the IRR method, but the simplest approach is to switch to the NPV method.

## Ranking

The IRR decision rule does not always rank projects in the same way as NPV. Sometimes it is important to find out, not only which project gives a positive return, but which one gives the greater positive return. For instance, projects may be mutually exclusive, that is, only one may be undertaken and a choice has to be made. The use of IRR alone sometimes leads to a poor choice (*see* Table 2.8).

**TABLE 2.8**  
**Illustration of the IRR ranking problem**

Project	Cash flows £m		IRR%	NPV (at 15%)
	Time 0	One year later		
A	-20	+40	100%	+14.78m
B	-40	+70	75%	+20.87m

*NPV at different discount rates*

Discount rate (%)	Project A	Project B
0	20	30
20	13.33	18.33
50	6.67	6.67
75	2.86	0
100	0	-5
125	-2.22	-8.89

It is clear that the ranking of the projects by their IRRs is constant at 75 and 100 percent, regardless of the opportunity cost of capital (discount rate). Project A is always better. On the other hand, ranking the projects by the NPV method is not fixed. The NPV ranking depends on the discount rate. If the discount rate used in the NPV calculation is higher than 50 percent, the ranking under both IRR and NPV would be the same, i.e. Project A is superior. If the discount rate falls below 50 percent, Project B is the better choice. One of the major elements leading to the theoretical dominance of NPV is that it takes into account the scale of investment; the shareholders are made better off by £20.87m by undertaking Project B because the initial size of the project is larger. NPVs are measured in absolute amounts.

## Conclusion

This chapter has provided insight into the key factors to consider when an organization is contemplating using financial (or other) resources for investment. The

analysis has been based on the assumption that the objective of any such investment is to maximize economic benefits to the owners of the enterprise. To achieve such an objective requires allowance for the opportunity cost of capital or time value of money as well as robust analysis of relevant cash flows. Given that time has a value, the precise timing of cash flows is important for project analysis. The net present value (NPV) and internal rate of return (IRR) methods of project appraisal are both discounted cash flow techniques so allow for the time value of money. However, the IRR method does present problems in a few special circumstances and so the theoretically preferred method is NPV.

NPV requires diligent studying and thought to be fully understood, and therefore it is not surprising to find in the workplace a bias in favour of communicating a project's viability in terms of percentages. In fact, most large organizations use three or four methods of project appraisal, rather than rely on only one for both rigorous analysis and communication – *see* Chapter 3 for more detail. The fundamental conclusion of this chapter is that the best method to maximize shareholder wealth in assessing investment projects is net present value.

## APPENDIX 2.1

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### Mathematical tools for finance

The purpose of this Appendix is to explain essential mathematical skills that are needed for the rest of the book. The author has no love of mathematics for its own sake so only those techniques of direct relevance to the subject matter of this textbook are covered in this section.

#### Simple and compound interest

When there are time delays between receipt and payment of financial sums we need to make use of the concepts of simple and compound interest.

##### Simple interest

Interest is paid only on the original principal. No interest is paid on the accumulated interest payments.

##### *Example 1*

Suppose that a sum of £10 is deposited in a bank account that pays 12 percent per annum. At the end of year 1 the investor has £11.20 in the account. That is:

$$F = P(1 + i)$$

$$11.20 = 10(1 + 0.12)$$

where  $F$  = Future value,  $P$  = Present value,  $i$  = Interest rate.

The initial sum, called the principal, is multiplied by the interest rate to give the annual return.

At the end of five years:

$$F = P(1 + in)$$

where  $n$  = number of years. Thus:

$$16 = 10(1 + 0.12 \times 5)$$

Note from the example that the 12 percent return is a constant amount each year. Interest is not earned on the interest already accumulated from previous years.

### Compound interest

The more usual situation in the real world is for interest to be paid on the sum that accumulates – whether or not that sum comes from the principal or from the interest received in previous periods. Interest is paid on the accumulated interest and principal.

#### Example 2

An investment of £10 is made at an interest rate of 12 percent with the interest being compounded. In one year the capital will grow by 12 percent to £11.20. In the second year the capital will grow by 12 percent, but this time the growth will be on the accumulated value of £11.20 so will amount to an extra £1.34. At the end of two years:

$$F = P(1 + i)(1 + i)$$

$$F = 11.20(1 + i)$$

$$F = 12.54$$

Alternatively,

$$F = P(1 + i)^2$$

Table 2.9 displays the future value of £1 invested at a number of different interest rates and for alternative numbers of years. (This is an extract from Appendix I at the end of the book.)

From the second row of the table we can read that £1 invested for two years at 12 percent amounts to £1.2544. The investment of £10 provides a future capital sum 1.2544 times the original amount:

$$£10 \times 1.2544 = £12.544$$



**TABLE 2.9**  
**The future value of £1**

Year	Interest rate (percent per annum)				
	1	2	5	12	15
1	1.0100	1.0200	1.0500	1.1200	1.1500
2	1.0201	1.0404	1.1025	1.2544	1.3225
3	1.0303	1.0612	1.1576	1.4049	1.5209
4	1.0406	1.0824	1.2155	1.5735	1.7490
5	1.0510	1.1041	1.2763	1.7623	2.0113

Over five years the result is:

$$F = P(1 + i)^n$$

$$17.62 = 10(1 + 0.12)^5$$

The interest on the accumulated interest is the difference between the total arising from simple interest and that from compound interest:

$$£17.62 - £16.00 = £1.62$$

Almost all investments pay compound interest and so we will be using this throughout the book.

## Present values

There are many occasions in financial management when you are given the future sums and need to find out what they are worth in present value terms today. For example, you wish to know how much you would have to put aside today which will accumulate, with compounded interest, to a defined sum in the future; or you are given the choice between receiving £200 in five years or £100 now and wish to know which is the better option, given anticipated interest rates; or a project gives a return of £1m in three years for an outlay of £800,000 now and you need to establish if this is the best use of the £800,000. By the process of discounting a sum of money to be received in the future is given a monetary value today.

### Example 3

If we anticipate the receipt of £17.62 in five years' time we can determine its present value. Rearrangement of the compound formula, and assuming a discount rate of 12 percent, gives:

$$P = \frac{F}{(1+i)^n} \text{ or } P = F \times \frac{1}{(1+i)^n}$$

$$10 = \frac{17.62}{(1+0.12)^5}$$

Alternatively, discount factors may be used, as shown in Table 2.10. (This is an extract from Appendix II at the end of the book.) The factor needed to discount £1 receivable in five years when the discount rate is 12 percent is 0.5674, so the present value of £17.62 is:

$$0.5674 \times £17.62 = £10$$

**TABLE 2.10**  
**The present value of £1**

Year	Interest rate (percent per annum)				
	1	5	10	12	15
1	0.9901	0.9524	0.9091	0.8929	0.8696
2	0.9803	0.9070	0.8264	0.7972	0.7561
3	0.9706	0.8638	0.7513	0.7118	0.6575
4	0.9610	0.8227	0.6830	0.6355	0.5718
5	0.9515	0.7835	0.6209	0.5674	0.4972

Examining the present value table in Appendix II you can see that as the discount rate increases the present value goes down. Also the further into the future the money is to be received, the less valuable it is in today's terms. Distant cash flows discounted at a high rate have a small present value; for instance, £1,000 receivable in 20 years when the discount rate is 17 percent has a present value of £43.30. Viewed from another angle, if you invested £43.30 for 20 years it would accumulate to £1,000 if interest compounds at 17 percent.

### Determining the rate of interest

Sometimes you want to calculate the rate of return that a project is earning. For instance, a savings company may offer to pay you £10,000 in five years if you deposit £8,000 now, when interest rates on accounts elsewhere are offering 6 percent per annum. To make a comparison you need to know the annual rate being offered by the savings company. We need to find  $i$  in the discounting equation.

To be able to calculate  $i$  it is necessary to rearrange the compounding formula. Since:

$$F = P(1+i)^n$$

First, divide both sides by  $P$ :

$$F/P = (1 + i)^n$$

(The  $P$ s on the right side cancel out.)

Second, take the root to the power  $n$  of both sides and subtract 1 from each side:

$$i = \sqrt[n]{[F/P]} - 1 \text{ or } i = [F/P]^{1/n} - 1$$

$$i = \sqrt[5]{\pounds 10,000 / \pounds 8,000} - 1 = 0.046 \text{ or } 4.6\%$$

Not a good deal compared with other accounts offering 6%.

#### **Example 4**

In the case of a five-year investment requiring an outlay of  $\pounds 10$  and having a future value of  $\pounds 17.62$  the rate of return is:

$$i = \sqrt[5]{\frac{17.62}{10}} - 1 = 12\%$$

$$i = [17.62 / 10]^{1/5} - 1 = 12\%$$

#### **Technical aside**

You can use the  $\sqrt[x]{y}$  or the  $\sqrt[y]{x}$  button, depending on the calculator.

Alternatively, use the future value table, an extract of which is shown in Table 2.9. In our example, the return on  $\pounds 1$  worth of investment over five years is:

$$\frac{17.62}{10} = 1.762$$

In the body of the future value table look at the Year 5 row for a future value of 1.762. Read off the interest rate of 12 percent.

An interesting application of this technique outside finance is to use it to put into perspective the pronouncements of politicians. For example in 1994, John Major made a speech to the Conservative Party conference promising to double national income (the total quantity of goods and services produced) within 25 years. This sounds impressive, but let us see how ambitious this is in terms of an annual percentage increase.

$$i = \sqrt[25]{\frac{F}{P}} - 1$$

$F$ , future income, is double  $P$ , the present income.

$$i = \sqrt[25]{\frac{2}{1}} - 1 = 0.0281 \text{ or } 2.81\%$$

The result is not too bad compared with the previous 20 years. However, performance in the 1950s and 1960s was better and Asian country growth rates are generally between 5 and 10 percent.

### The investment period

Rearranging the standard equation so that we can find  $n$  (the number of years of the investment), we create the following equation:

$$F = P(1 + i)^n$$

$$F/P = (1 + i)^n$$

$$\log(F/P) = \log(1 + i)n$$

$$n = \frac{\log(F/P)}{\log(1 + i)}$$

#### Example 5

How many years does it take for £10 to grow to £17.62 when the interest rate is 12 percent?

$$n = \frac{\log(17.62/10)}{\log(1 + 0.12)}$$

Therefore  $n = 5$  years.

#### An application outside finance

How many years will it take for China to double its real national income if growth rates continue at 10 percent per annum?

*Answer:*

$$n = \frac{\log(2/1)}{\log(1 + 0.1)} = 7.3 \text{ years (quadrupling in less than 15 years)}$$

Consider the geopolitical implications of this!

### Annuities

Quite often there is not just one payment at the end of a certain number of years. There can be a series of identical payments made over a period of years.

For instance:

- bonds usually pay a regular rate of interest;
- individuals can buy, from saving plan companies, the right to receive a number of identical payments over a number of years;
- a business might invest in a project which, it is estimated, will give regular cash inflows over a period of years;
- a typical house mortgage is an annuity.

An annuity is a series of payments or receipts of equal amounts. We are able to calculate the present value of this set of payments.

**Example 6**

For a regular payment of £10 per year for five years, when the interest rate is 12 percent, we can calculate the present value of the annuity by three methods.

*Method 1*

$$P_{an} = \frac{A}{(1+i)} + \frac{A}{(1+i)^2} + \frac{A}{(1+i)^3} + \frac{A}{(1+i)^4} + \frac{A}{(1+i)^5}$$

where  $A$  = the periodic receipt.

$$P_{10,5} = \frac{10}{(1.12)} + \frac{10}{(1.12)^2} + \frac{10}{(1.12)^3} + \frac{10}{(1.12)^4} + \frac{10}{(1.12)^5} = \text{£}36.05$$

*Method 2*

Using the derived formula:

$$P_{an} = \frac{1 - 1/(1+i)^n}{i} \times A$$

$$P_{10,5} = \frac{1 - 1/(1 + 0.12)^5}{0.12} \times 10 = \text{£}36.05$$

*Method 3*

Use the 'Present Value of an Annuity' table. (See Table 2.11, an extract from the more complete annuity table in Appendix III.) Here we simply look along the year 5 row and 12 percent column to find the figure of 3.605. This refers to the present value of five annual receipts of £1. Therefore we multiply by £10:

$$3.605 \times \text{£}10 = \text{£}36.05$$

**TABLE 2.11**  
**The present value of an annuity of £1 per annum**

Year	Interest rate (percent per annum)				
	1	5	10	12	15
1	0.9901	0.9524	0.9091	0.8929	0.8696
2	1.9704	1.8594	1.7355	1.6901	1.6257
3	2.9410	2.7232	2.4869	2.4018	2.2832
4	3.9020	3.5459	3.1699	3.0373	2.8550
5	4.8535	4.3295	3.7908	3.6048	3.3522

The student is strongly advised against using Method 1. This was presented for conceptual understanding only. For any but the simplest cases, this method can be very time consuming.

## Perpetuities

Some contracts run indefinitely and there is no end to the payments. Perpetuities are rare in the private sector, but certain government securities do not have an end date; that is, the capital value of the bond will never be paid to the lender, only interest payments are made. For example, the UK government has issued Consolidated Stocks or War Loans that will never be redeemed. Also, in a number of project appraisals or share valuations it is useful to assume that regular annual payments go on forever. Perpetuities are annuities that continue indefinitely. The value of a perpetuity is simply the annual amount received divided by the interest rate when the latter is expressed as a decimal.

$$P = \frac{A}{i}$$

If £10 is to be received as an indefinite annual payment then the present value, at a discount rate of 12 percent, is:

$$P = \frac{10}{0.12} = \text{£}83.33$$

It is very important to note that to use this formula we are assuming that the first payment arises 365 days after the time at which we are standing (the present time or time zero).

## Discounting semi-annually, monthly and daily

Sometimes financial transactions take place on the basis that interest will be calculated more frequently than once a year. For instance, if a bank account paid

12 percent nominal return per year, but credited 6 percent after half a year, in the second half of the year interest could be earned on the interest credited after the first six months. This will mean that the true annual rate of interest will be greater than 12 percent.

The greater the frequency with which interest is earned, the higher the future value of the deposit.

**Example 7**

If you put £10 in a bank account earning 12 percent per annum then your return after one year is:

$$10(1 + 0.12) = \text{£}11.20$$

If the interest is compounded semi-annually (at a nominal annual rate of 12 percent):

$$10(1 + [0.12/2])(1 + [0.12/2]) = 10(1 + [0.12/2])^2 = \text{£}11.236$$

The difference between annual compounding and semi-annual compounding is an extra 3.6p. After six months the bank credits the account with 60p in interest so that in the following six months the investor earns 6 percent on the £10.60.

If the interest is compounded quarterly:

$$10(1 + [0.12/4])^4 = \text{£}11.255$$

Daily compounding:

$$10(1 + [0.12/365])^{365} = \text{£}11.2747$$

**Example 8**

If £10 is deposited in a bank account that compounds interest quarterly and the nominal return per year is 12 percent, how much will be in the account after eight years?

$$10(1 + [0.12/4])^{4 \times 8} = \text{£}25.75$$

**Converting monthly and daily rates to annual rates**

Sometimes you are presented with a monthly or daily rate of interest and wish to know what that is equivalent to in terms of Annual Percentage Rates (APR) or Annual Equivalent Rate (AER).

If  $m$  is the monthly interest or discount rate, then over 12 months:

$$(1 + m)^{12} = 1 + i$$

where  $i$  is the annual compound rate.

$$i = (1 + m)^{12} - 1$$

If a credit card company charges 1.5 percent per month, the annual percentage rate (APR) is:

$$i = (1 + 0.015)^{12} - 1 = 19.56\%$$

If you want to find the monthly rate when you are given the APR:

$$m = (1 + i)^{1/12} - 1 \text{ or } m = \sqrt[12]{(1+i)} - 1$$

$$m = (1 + 0.1956)^{1/12} - 1 = 0.015 = 1.5\%$$

Daily rate:

$$(1 + d)^{365} = 1 + i$$

where  $d$  is the daily discount rate.





# TRADITIONAL APPRAISAL TECHNIQUES

Introduction

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What appraisal techniques do  
businesses use?

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Payback

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Accounting rate of return

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Internal rate of return: reasons for  
continued popularity

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Conclusion

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## Introduction

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The payback and accounting rate of return (ARR) methods of evaluating capital investment proposals have historically been, and continue to be, very popular approaches, despite the best efforts of a number of writers to denigrate them. It is important to understand the disadvantages of these methods, but it is also useful to be aware of why practical business people still see a great deal of merit in observing the outcome of these calculations.

## What appraisal techniques do businesses use?

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A number of surveys enquiring into the appraisal methods used in practice have been conducted over the past 20 years. The results from surveys conducted by Pike and by the author jointly with Panos Hatzopoulos are displayed in Table 3.1. Some striking features emerge from these and other studies. Payback remains in wide use, despite the increasing application of discounted cash flow techniques. Internal rate of return is at least as popular as net present value. However, NPV is gaining rapid acceptance. Accounting rate of return continues to be the laggard, but is still used in over 50 percent of large firms. One observation that is emphasized in many studies is the tendency for decision-makers to use more than one method. In the 1997 study, 67 percent of firms use three or four of these techniques. These methods are regarded as being complementary rather than competitors.

**These methods are regarded as being complementary rather than competitors.**

There is an indication in the literature that while some methods have superior theoretical justification, other, simpler, methods are used for purposes such as communicating project viability and gaining commitment throughout an organization. It is also suggested that those who sponsor and advance projects within organizations like to have the option of presenting their case in an alternative form which shows the proposal in the best light.

Another clear observation from the literature is that small and medium-sized firms use the sophisticated formal procedures less than their larger brethren.

## Payback

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The payback period for a capital investment is the length of time before the cumulated stream of forecasted cash flows equals the initial investment.

The decision rule is that if a project's payback period is less than or equal to a predetermined threshold figure it is acceptable. Consider the case of Tradfirm's three mutually exclusive proposed investments (*see* Table 3.2):

**TABLE 3.1**  
**Appraisal techniques used**

	Proportion of companies using technique							
	Pike surveys <sup>a</sup>				Arnold and Hatzopoulos survey <sup>b</sup>			
	1975	1980	1986	1992	1997			
	%	%	%	%	Small %	Medium %	Large %	Total %
Payback	73	81	92	94	71	75	66	70
Accounting rate of return	51	49	56	50	62	50	55	56
Internal rate of return	44	57	75	81	76	83	84	81
Net present value	32	39	68	74	62	79	97	80

Capital budget (per year) for companies in Arnold and Hatzopoulos study approx.

Small: £1–50m. Medium: £1–100m. Large: £100m+

*Notes*

(a) Pike's studies focus on 100 large UK firms.

(b) In the Arnold and Hatzopoulos study (2000), 300 finance directors of UK companies taken from *The Times* 1000 (London: Times Books), ranked according to capital employed (excluding investment trusts), were asked dozens of questions about project appraisal techniques, sources of finance and performance measurement. The first 100 (large size) of the sample are the top 100; another 100 are in the rankings at 250–400 (medium size); the final 100 are ranked 820–1,000 (small size). The capital employed ranges between £1.3bn and £24bn for the large firms, £207m and £400m for the medium-sized firms, and £40m and £60m for the small companies. Ninety-six usable replies were received: 38 large, 24 medium and 34 small.

Sources: R.H. Pike (1988) 'An empirical study of the adoption of sophisticated capital budgeting practices and decision making effectiveness', *Accounting and Business Research*, 18 (72), Autumn, pp. 341–51. R.H.Pike (1996) 'A longitudinal survey of capital budgeting practices', *Journal of Business Finance and Accounting*, 23(1), pp.79–92. Arnold and Hatzopoulos (2000) 'The theory practice gap in capital budgeting: evidence from the United Kingdom' *Journal of Business Finance and Accounting*, 27(5) and (6), June/July, pp. 603–26.

**TABLE 3.2**

**Tradfirm**

Points in time (yearly intervals)	Cash flows (£m)						
	0	1	2	3	4	5	6
Project A	-10	6	2	1	1	2	2
Project B	-10	1	1	2	6	2	2
Project C	-10	3	2	2	2	15	10

Note: Production ceases after six years, and all cash flows occur on anniversary dates.

There is a boardroom battle in Tradfirm, with older members preferring the payback rule. They set four years as the decision benchmark. For both A and B the £10m initial outflow is recouped after four years. In the case of C it takes five years for the cash inflows to cumulate to £10m. Thus payback for the three projects is as follows:

Project A:	4 years
Project B:	4 years
Project C:	5 years

If the payback rule is rigidly applied, the older members of the board will reject the third project, and they are left with a degree of indecisiveness over whether to accept A or B. The younger members prefer the NPV rule and are thus able to offer a clear decision.

*Tradfirm: Net Present Values (£m)*

$$\text{Project A } -10 + \frac{6}{1.1} + \frac{2}{(1.1)^2} + \frac{1}{(1.1)^3} + \frac{1}{(1.1)^4} + \frac{2}{(1.1)^5} + \frac{2}{(1.1)^6} = \text{£}0.913\text{m}$$

$$\text{Project B } -10 + \frac{1}{1.1} + \frac{1}{(1.1)^2} + \frac{2}{(1.1)^3} + \frac{6}{(1.1)^4} + \frac{2}{(1.1)^5} + \frac{2}{(1.1)^6} = \text{£}0.293\text{m}$$

$$\text{Project C } -10 + \frac{3}{1.1} + \frac{2}{(1.1)^2} + \frac{2}{(1.1)^3} + \frac{2}{(1.1)^4} + \frac{15}{(1.1)^5} + \frac{10}{(1.1)^6} = \text{£}12.208\text{m}$$

*Note:* The discount rate is 10 percent.

Project A has a positive NPV and is shareholder wealth-enhancing. Project B has a negative NPV; the firm would be better served by investing the £10m in the alternative that offers a 10 percent return. Project C has the largest positive NPV so it creates most shareholder wealth.

### Drawbacks of payback

- It makes no allowance for the time value of money. It ignores the need to compare future cash flows with the initial investment after they have been discounted to their present values.
- Receipts beyond the payback period are ignored. This problem is particularly obvious in the case of Project C.
- The arbitrary selection of the cut-off point. There is no theoretical basis for setting the appropriate time period and so guesswork, whim and manipulation take over.

## Discounted payback

With discounted payback the future cash flows are discounted prior to calculating the payback period. This is an improvement on the simple payback method in that it takes into account the time value of money. In Table 3.3 the *discounted* cash inflows are added together to calculate payback. In the case of Project B the discounted cash inflows never reach the level of the cash outflow.

This modification tackles the first drawback of the simple payback method but it is still necessary to make an arbitrary decision about the cut-off date and it ignores cash flows beyond that date.

**TABLE 3.3**  
**Discounted payback: Tradfirm plc (£m)**

Points in time (yearly intervals)	0	1	2	3	4	5	6	Discounted payback
<b>Project A</b>								
Undiscounted cash flow	-10	6	2	1	1	2	2	
Discounted cash flow	-10	5.45	1.65	0.75	0.68	1.24	1.13	Year 6
<b>Project B</b>								
Undiscounted cash flow	-10	1	1	2	6	2	2	Outflow -10m
Discounted cash flow	-10	0.909	0.826	1.5	4.1	1.24	1.13	Inflow +£9.7m
<b>Project C</b>								
Undiscounted cash flow	-10	3	2	2	2	15	10	
Discounted cash flow	-10	2.72	1.65	1.5	1.37	9.3	5.64	Year 5

Note: The discount rate is 10 percent

## Reasons for the continuing popularity of payback

Payback remains a widely used project appraisal method despite its drawbacks. This requires some explanation.

- The first fact to note is that payback is rarely used as the primary investment technique, but rather as a secondary method which supplements the more sophisticated methods. Although it appears irrational to employ payback when the issue is examined in isolation, we may begin to see the logic behind its use if we take into account the organizational context and the complementary nature of alternative techniques. For example, payback may be used at

an early stage to filter out projects that have clearly unacceptable risk and return characteristics. Identifying those projects at a preliminary stage avoids the need for more detailed evaluation through a discounted cash flow method, thus increasing the efficiency of the appraisal process. This early sifting has to be carefully implemented to avoid premature rejection.

- Payback also has one extraordinarily endearing quality to busy managers: it is simple and easy to use. Executives often admit that the payback rule, used indiscriminately, does not always give the best decisions, but it is the simplest way to communicate an idea of project profitability. NPV is difficult to understand, so it is useful to have an alternative measure

Payback is simple and easy to use.

which all managers can follow. In the workplace a project's success often relies on the gaining of widespread employee commitment. Discussion, negotiation and communication of ideas often need to be carried out in a simple form so that non-quantitative managers can make their contribution and, eventually, give their commitment. Communication in terms of the sophisticated models may lead to alienation and exclusion and, ultimately, project failure.

- Another argument advanced by practitioners is that projects that return their outlay quickly reduce the exposure of the firm to risk. In the world beyond the simplifications needed in academic exercises there is a great deal of uncertainty about future cash flows. Managers often distrust forecasts for more distant years. Payback has an implicit assumption that the risk of cash flows is directly related to the time distance from project implementation date. By focusing on near-term returns this approach uses only those data in which management have greatest faith. Take the case of the internet service provider (ISP) industry. Here, competitive forces and technology are changing so rapidly that it is difficult to forecast for eight months ahead, let alone for eight years, so managers may choose to ignore cash flow projections beyond a certain number of years. Those who advocate NPV counter this approach by saying that risk is accounted for in a better way in the NPV model than is done by simply excluding data. Adjusting for risk in NPV calculations is considered in Chapter 5.
- A further advantage of payback, as perceived by many managers, is its use in situations of capital shortage. If funds are limited, there is an advantage in receiving a return on projects earlier rather than later, as this permits investment in other profitable opportunities. But, as we have seen with Project 3, relying solely on payback because of the speedy return of capital can result in the sacrifice of massive cash flows just after the cut off.

This section is not meant to promote the use of payback. It remains a theoretically inferior method to the discounted cash flow approaches. Payback has a number of valuable attributes, but the primary method of project appraisal in most organizations should take into account all of the relevant cash flows and then discount them.

## Accounting rate of return

The accounting rate of return (ARR) method may be known to readers by other names such as the return on capital employed (ROCE) or return on investment (ROI). The ARR is a ratio of the accounting profit to the investment in the project, expressed as a percentage.

The *decision rule* is that if the ARR is greater than, or equal to, a hurdle rate then accept the project.

This ratio can be calculated in a number of ways, but the most popular approach is to take profit after deduction of depreciation. For the investment figure we regard any increases in working capital as adding to the investment required. Three alternative versions of ARR are calculated for Timewarp plc which give markedly different results (*see* Worked Example 3.1). These are just three of all the possible ways of calculating ARR – there are many more. The fact that there are many ways of calculating a measure of project valuation and performance should be ringing alarm bells – ‘choose your result by choosing your method of calculation’ is not a sound basis for decision-making.

### Worked example 3.1

#### TIMEWARP PLC

Timewarp is to invest £30,000 in machinery for a project which has a life of three years. The machinery will have a zero scrap value and will be depreciated on a straight-line basis.

*Accounting rate of return, version 1 (annual basis)*

$$\text{ARR} = \frac{\text{Profit for the year}}{\text{Asset book at start of year}} \times 100$$

<i>Time (year)</i>	1	2	3
	£	£	£
Profit before depreciation	15,000	15,000	15,000
Less depreciation	10,000	10,000	10,000
Profit after depreciation	5,000	5,000	5,000
Value of asset (book value)			
Start of year	30,000	20,000	10,000
End of year	20,000	10,000	0
Accounting rate of return	$\frac{5,000}{30,000} = 16.67\%$	$\frac{5,000}{20,000} = 25\%$	$\frac{5,000}{10,000} = 50\%$



On average the ARR is:  $1/3 \times (16.67 + 25 + 50)\% = 30.55\%$ .

Note the illusion of an annual rise in profitability despite the profits remaining constant.

*Accounting rate of return, version 2 (total investment basis)*

$$\text{ARR} = \frac{\text{Average annual profit}}{\text{Initial capital invested}} \times 100$$

$$\text{ARR} = \frac{(5,000 + 5,000 + 5,000)/3}{30,000} \times 100 = 16.67\%$$

*Accounting rate of return, version 3 (average investment basis)*

$$\text{ARR} = \frac{\text{Average annual profit}}{\text{Initial capital invested}} \times 100$$

$$\text{Average capital invested: } \frac{30,000}{2} = 15,000$$

(at time 0 the machinery has a value of £30,000, three years later it has a value of zero. If we assume constant devaluation then the average value of the machinery is £15,000)

$$\text{ARR} = \frac{(5,000 + 5,000 + 5,000)/3}{15,000} \times 100 = 33.33\%$$

## Drawbacks of accounting rate of return

- The number of alternative ARR calculations can be continued beyond the three possibilities described in Worked Example 3.1. Each alternative would be a legitimate variant and would find favor with some managers and accountants. The almost wide-open field for selecting profit and asset definitions is a major weakness of ARR. This flexibility may tempt decision-makers to abuse the technique to suit their purposes.
- The inflow and outflow of cash should be the focus of investment analysis appraisals. Profit figures are very poor substitutes for cash flow because they frequently fail to show when cash is received and when it flows out. For example, a £10m machine purchase this year is a cash outflow of £10m, but may result in a depreciation entry for the profit and loss account of only £1m. The £9m difference is merely one of hundreds of accounting entries that make profit figures inappropriate for project evaluation. Another area of concern is working capital. For example, a project requiring an increase in inventory (e.g. raw material) will see an outflow of cash for this purpose, but the accountant's profit calculations for the project do not change just because one

current asset, i.e. cash, has been used up, because it has been replaced by an equal amount of another asset, i.e. inventory, such as raw materials. There is no effect on profit but there could be a large effect on cash flow. Shareholders wealth depends on when cash goes in and when it comes out. The same issue exists for cash used to increase the level of trade debtors or the release of cash by using supplier cash to finance the business (by increasing trade credit).

- The most important criticism of accounting rate of return is that it fails to take account of the time value of money. There is no allowance for the fact that cash received in Year 1 is more valuable than an identical sum received in Year 3.
- There is a high degree of arbitrariness in defining the cut-off or hurdle rate. There is no sound logical reason for selecting 10, 15 or 20 percent as the acceptable ARR. It is a case of picking a number from the air. However, NPV has a firm logical base to the discount rate used by the company for a project. It is the opportunity cost of the suppliers of capital. We examine its calculation in Chapter 10.
- Accounting rate of return can lead to some perverse decisions. For example, suppose that Timewarp use the second version, the total investment ARR, with a hurdle rate of 15 percent, and the appraisal team discover that the machinery will in fact generate an additional profit of £1,000 in a fourth year. Common sense suggests that if all other factors remain constant this new situation is better than the old one, and yet the ARR declines to below the threshold level (15 percent) because the profits are averaged over four years rather than three and the project is therefore rejected.

The original situation is:

$$\text{ARR} = \frac{(5,000 + 5,000 + 5,000)/3}{30,000} \times 100 = 16.67\% \quad \text{Accepted}$$

The new situation is:

$$\text{ARR} = \frac{(5,000 + 5,000 + 5,000 + 1,000)/4}{30,000} \times 100 = 13.33\% \quad \text{Rejected}$$

An alternative way of viewing this problem is to think of two projects that are identical except that one offers the additional £1,000. If only one project can be accepted which will the managers go for? If they are motivated by ARR (e.g. by bonuses related to ARR achieved) they may be inclined to accept the project that offers the highest ARR even if this means sacrificing £1,000 of shareholders' money.

### Reasons for the continued use of accounting rate of returns

Table 3.1 shows that over one-half of large firms calculate ARR when appraising projects, so the conclusion must be that in the practical world of business, some merit is seen in this technique. One possible explanation is that managers are

familiar with this ancient and extensively used profitability measure. The financial press regularly report accounting rates of return. Divisional performance is often judged on a profit-to-assets employed ratio. Indeed, the entire firm is often analyzed and management evaluated on this ratio. Because performance is measured in this way, managers have a natural bias towards using it in appraising future projects. Conflicting signals are sometimes sent to managers controlling a division. They are expected to use a discounted cash flow approach for investment decisions, but find that their performance is being monitored on a profit-to-investment ratio basis. This dichotomy may produce a resistance to proposed projects that produce low returns in the early years and thus report a low ARR to head office. This may result in excellent long-term opportunities being missed.

### Internal rate of return: reasons for continued popularity

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Table 3.1 shows that firms use IRR as much as the theoretically superior NPV. Given the problems associated with IRR described in Chapter 2, this may seem strange. It is all the more perplexing if one considers that IRR is often more difficult to calculate manually than NPV (although, with modern computer programs, the computational difficulties virtually disappear). Some possible explanations follow.

- **Psychological** Managers are familiar with expressing financial data in the form of a percentage. It is intuitively easier to grasp what is meant by an IRR of 15 percent than, say, an NPV of £2,000.
- **IRR can be calculated without knowledge of the required rate of return** Making a decision using the IRR involves two separate stages. Stage 1 involves gathering data and then computing the IRR. Stage 2 involves comparing this with the cut-off rate. By contrast, it is not possible to calculate NPV without knowing the required rate of return. The proposal has to be analyzed in one stage only. In a large company it is possible for senior managers to request that profit centers and divisions appraise projects on the basis of their IRRs, while refusing to communicate in advance the rate of return required. This has at least two potential advantages. First, the required rate may change over time and it becomes a simple matter of changing the cut-off comparison rate at head office once the IRR computations are received from lower down the organization. With NPV, each project's cash flows would need to be calculated again at the new discount rate. Secondly, managers are only human and there is a tendency to bias information passed upwards so as to achieve their personal goals. For instance, it has been known for ambitious managers to be excessively optimistic concerning the prospects for projects that would lead to an expansion

of their domain. If they are provided with a cut-off rate prior to evaluating projects you can be sure that all projects they sponsor will have cash flows 'forecasted' to produce a return greater than the target. If the head office team choose not to communicate a cut-off rate, this leaves them free to adjust the required return to allow for factors such as over-optimism. They may also adjust the minimum rate of return for perceived risk associated with particular projects or divisions.

- **Ranking** Some managers are not familiar with the drawbacks of IRR and believe that ranking projects to select between them is most accurately and most easily carried out using the percentage-based IRR method. This was, in Chapter 2, shown not to be the case.

## Conclusion

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We can see why most firms use three or four measures when evaluating the return on a project. Payback, ARR and IRR provide alternative perspectives, and are useful for communicating project viability to a wide range of team members. However, the preferred method for the final decision must be NPV in a rationally managed, shareholder wealth-oriented company.



# 4

## INVESTMENT DECISION-MAKING IN COMPANIES

Introduction

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The managerial art of investment selection

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More tricky issues in real world  
project appraisal

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The stages of investment decision-making

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Conclusion

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## Introduction

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An organization may be viewed simply as a collection of projects, some of which were started a long time ago, some only recently begun, many are major 'strategic' projects and others minor operating-unit-level schemes. It is in the nature of business for change to occur, and through change old activities, profit centers and methods die, to be replaced by the new. Without a continuous process of regeneration firms will cease to progress and be unable to compete in a dynamic environment. It is vital that the processes and systems that lead to the development of new production methods, new markets and products, and so on, are efficient. That is, both the project appraisal techniques and the entire process of proposal creation and selection lead to the achievement of the objective of the organization. Poor appraisal technique, set within the framework of an investment process that does not ask the right questions and which provides erroneous conclusions, will destroy the wealth of shareholders.

The employment of project appraisal techniques must be seen as merely one of the stages in the process of the allocation of resources within a firm. The appraisal stage can be reached only after ideas for the use of capital resources have been generated and those ideas have been filtered through a consideration of the strategic, budgetary and business resource capabilities of the firm. The appraisal stage is followed by the approval, implementation and post-completion auditing.

Any capital allocation system has to be viewed in the light of the complexity of organizational life. This aspect was ignored in Chapter 2, where mechanical analysis is applied. The balance is corrected in this chapter. It considers the process of project development, appraisal and post-investment monitoring.

No doubt the project to build the Airbus 380 (*see* Case study 4.1) has been through many of the stages of project development and implementation discussed in this chapter: from the generation of the idea, its screening for budgetary and strategic constraints, to a thorough analysis in quantitative terms. Now that the aircraft are being produced, there will be a capital expenditure control system designed to monitor progress against targets. And, over the next few years, there will be an audit of the entire project.

### Case study 4.1

#### Will it fly?

##### **Airbus's Superjumbo**

Surely one of the biggest investment appraisal decisions ever made was when Airbus decided to go ahead and produce the A380 superjumbo. This is one of those 'bet the company' type investments. A massive \$10,700m will be needed to create this monster aircraft.

It was tough and go all through 2000 as to whether Airbus would dare to invest so much money. Before they said 'yes let's do it' they had to have firm orders for at least 50 aircraft. Finally, just before Christmas the sixth major buyer signed up to take the order book to 50 definite and 42 on option (the airlines have the right to buy, but not the obligation).

The A380 will be significantly larger than Boeing's highly successful 747. It will carry 555 passengers (compared with 416). It will also cut direct operating costs for the airlines by 15–20% compared with Boeing's 747–400 and will be able to fly 10% further (8,150 nautical miles).

So, where is all the money on development and build going? This is a project at the cutting edge of technology. The remarkable innovations cost a tremendous amount in terms of up-front cost, but the benefit will be spread out over many decades. Here are some of the innovations:

- New, weight-saving materials
- Better aerodynamics
- Carbon-fiber reinforced plastic central wingbox. Forty percent of the structure and components will be made from new carbon components and metal alloys.
- Upper fuselage shell is not to be aluminum but glare: a laminate with alternative layers of aluminum and glass-fiber reinforced adhesive
- Innovative hydraulic systems and air conditioning.

Airbus reckoned they needed to sell at least 250 aircraft to break even in cash flow terms. (Presumably meaning that nominal cumulative cash inflows equal nominal cumulative cash outflows.) To achieve a positive net present value would require the sale of hundreds more aircraft. Each airplane has a list price of around \$216m–\$230m, but don't pay too much attention to that, as airlines receive substantial discounts. At full tilt something like 96,000 people will be working on this aircraft.

And yet it could so easily have been abandoned. Boeing decided not to develop a super-jumbo because it estimated the maximum market at 500 as they think that airlines are generally content to continue using the 747. Airbus estimated the market for jumbos and superjumbos at 1,550. It expects to take two-thirds of that business, worth \$400bn in today's prices.

Less than three years after going ahead with the project Airbus passed the halfway mark to break even with 129 firm orders or commitments, mostly thanks to a flow of deals with Asian airlines in late 2003.

## The managerial art of investment selection

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This book places strong emphasis on the formal methods of project appraisal, so a word of warning is necessary at this point. Mathematical technique is merely one element needed for successful project appraisal. The quantitative analysis is only the starting point for decision-making. In most real-world situations there are many qualitative factors that need to be taken into account. The techniques described in Chapter 2 cannot be used in a mechanical fashion. Management is largely an art form with a few useful quantitative techniques to improve the quality of the art. For instance, in generating and evaluating major investments the firm has to take into account the following.

### Strategy

The relationship between the proposed project and the strategic direction of the firm is very important. A business unit investment isolated from the main thrust of the firm may be a distraction in terms of managerial attention and financial



resources. A project that looks good at divisional level may not be appropriate when examined from the whole-firm perspective. It may even be contradictory to the firm's goals. For example, luxury goods companies are sometimes enticed to produce lower priced items for the mass market or to stretch the brand into unrelated areas. The project, when judged on its own appears to have a very high NPV. But there is the danger of losing the premium brand strategic position (expensive and exclusive) in the existing product ranges by being associated with something that does not quite fit the image the firm has nurtured.

### **Social context**

The effect on individuals is a crucial consideration. Projects require people to implement them. Their enthusiasm and commitment will be of central importance. Neglecting this factor may lead to resentment and even sabotage. Discussion and consensus on major project proposals may matter more than selecting the mathematically correct option. In many cases, quantitative techniques are avoided because they are precise. It is safer to sponsor a project in a non-quantifiable or judgmental way at an early stage in its development. If, as a result of discussion with colleagues and superiors, the idea becomes more generally accepted and fits into the pervading view on the firm's policy and strategy, the figures are presented in a report. Note here the order of actions. First, general acceptance. Second, quantification. A proposal is usually discussed at progressively higher levels of management before it is 'firmed up' into a project report. One reason for this is that continuing commitment and support from many people will be needed if the project is to succeed. To engender support and to improve the final report it is necessary to start the process in a rather vague way, making room for modifications in the light of suggestions. Some of these suggestions will be motivated by shareholder wealth considerations, others by goals closer to the hearts of key individuals. Allowing adaptability in project development also means that if circumstances change, say, in the competitive environment, the final formal appraisal takes account of this. The sponsor or promoter of a capital investment has to be aware of, and to adjust for, social sub-systems within the organization.

### **Expense**

Sophisticated project evaluation can cost a considerable amount of money. The financial experts' input is costly enough, but the firm also has to consider the time and trouble managers throughout the organization might have to devote to provide good-quality data and make their contribution to the debate. In a firm of limited resources it may be more efficient to search for projects at an informal manner, thus generating a multitude of alternative avenues for growth, rather than analyzing a few in greater quantitative depth.

## Forget how the crow flies

If you want to go in one direction, the best route may involve going in the other. Paradoxical as it sounds, goals are more likely to be achieved when pursued indirectly. So the most profitable companies are not the most profit-oriented, and the happiest people are not those who make happiness their main aim. The name of this idea? **Obliquity**

John Kay

I once said that Boeing's grip on the world civil aviation market made it the most powerful market leader in world business. Bill Allen was chief executive from 1945 to 1968, as the company created its dominant position. He said that his spirit and that of his colleagues was to eat, breathe, and sleep the world of aeronautics. 'The greatest pleasure life has to offer is the satisfaction that flows from participating in a difficult and constructive undertaking,' he explained.

Boeing's 737, with almost 4,000 planes in the air, is the most successful commercial airliner in history. But the company's largest and riskiest project was the development of the 747 jumbo jet. When a non-executive director asked about the expected return on investment, he was brushed off: there had been some studies, he was told, but the manager concerned couldn't remember the results.

It took only 10 years for Boeing to prove me wrong in asserting that its market position in civil aviation was impregnable. The decisive shift in corporate culture followed the acquisition of its principle US rival, McDonnell Douglas, in 1997. The transformation was exemplified by the CEO, Phil Condit. The company's previous preoccupation with meeting 'technological challenges of supreme magnitude' would, he told *Business Week*, now have to change. 'We are going into a value-based environment where unit cost, return on investment and shareholder return are the measures by which you'll be judged. That's a big shift.'

The company's senior executives agreed to move from Seattle, where the main production facilities were located, to Chicago. More importantly, the more focused business reviewed risky investments in new civil projects with much greater scepticism. The strategic decision was to redirect resources towards projects for the US military that involved low financial risk. Chicago had the advantage of being nearer to Washington, where government funds were dispensed.

So Boeing's civil orderbook today lags behind that of Airbus, the European consortium whose aims were not initially commercial but which has, almost by chance, become a profitable business. And the strategy of getting close to the Pentagon proved counter-productive: the company got too close to the Pentagon, and faced allegations of corruption. And what was the market's verdict on the company's performance in terms of unit cost, return on investment and shareholder return? Boeing stock, \$48 when Condit took over, rose to \$70 as he affirmed the commitment to shareholder value; by the time of his enforced resignation in December 2003 it had fallen to \$38.

... at Boeing, the attempt to focus on simple, well defined objectives proved less successful than management with a broader, more comprehensive conception of objectives.

... Obliquity gives rise to the profit-seeking paradox: the most profitable companies are not the most profitable-oriented. ICI and Boeing illustrate how

a greater focus on shareholder returns was self-defeating in its own narrow terms. Comparisons of the same companies over time are mirrored in contrasts between different companies in the same industries. In their 2002 book, *Built to Last: Successful Habits of Visionary Companies*, Jim Collins and Jerry Porras compared outstanding companies with adequate but less remarkable companies with similar operations.

Merck and Pfizer was one such comparison. Collins and Porras compared the philosophy of George Merck ('We try never to forget that medicine is for the people. It is not for the profits. The profits follow, and if we have remembered that, they have never failed to appear. The better we have remembered it, the larger they have been') with that of John McKeen of Pfizer ('So far as humanly possible, we aim to get profit out of everything we do').

Collins and Porras also paired Hewlett Packard with Texas Instruments, Procter & Gamble with Colgate, Marriott with Howard Johnson, and found the same result in each case: the company that put more emphasis on profit in its declaration of objectives was the less profitable in its financial statements.

... Would Boeing really have benefited from careful analyses in the mid-1960s of the prospective return on investment from development of the 747? An analyst would have had to anticipate the oil shock, the globalisation of world markets and the development of the aviation industry through to the end of the century. Anyone who has built models of these kinds, or scrutinised them carefully, knows that the range of possible assumptions is always wide enough to allow the analyst to come up with whatever answer the person commissioning the assessment wants to hear.

#### EXHIBIT 4.1 Forget how the crow flies

Source: *Financial Times Magazine* 17 January 2004

### Stifling the entrepreneurial spirit

Excessive emphasis on formal evaluatory systems may be demotivating to individuals who thrive on free-thinking, fast decision-making and action. The relative weights given to formal approaches and entrepreneurialism will depend on the context, such as the pace of change in the market-place.

In the 1990s arguably Boeing sacrificed its vision of being a company always on the cutting-edge of commercial plane design, breaking through technological and market-place barriers. This reduced the vibrancy of the pioneering spirit of the organization, as it refocused on short-term financial performance measures. This is expressed well by John Kay – see Exhibit 4.1. Professor Kay makes a valid point that in going directly for 'shareholder value' firms may actually do less well for shareholders than those that focus on vision and excellence first and find themselves shareholder wealth maximizers in an oblique way. However, it is possible to argue that Boeing's managers, in the 1990s were not, in fact, shareholder wealth maximizers in the sense described in Chapter 1 because they forgot the crucial 'long-term' focus. Being daring and at the cutting-edge may be risky, but it often leads to the highest long-term shareholder wealth.

Concentrating on short-term financial goals and presenting these as shareholder wealth maximizing actions can lead to slow pace and market irrelevance. So, being too fastidious in requiring immediately visible and quantifiable returns in an uncertain world can result in the rejection of extremely valuable projects that require a leap into the unknown by a team of enthusiasts. Where would Microsoft be today if in the 1970s it had conducted rigorous NPV analysis on its operating systems when PC sales numbered a few thousand?

### Intangible benefits

Frequently, many of the most important benefits that flow from an investment are difficult to measure in money terms. Improving customer satisfaction through better service, quality or image may lead to enhanced revenues, but it is often difficult to state precisely the quantity of the increased revenue flow. For example, new technology often provides a number of intangible benefits, such as reduced time needed to switch machine tools to the production of other products, thereby reducing risk in fluctuating markets, or a quicker response to customer choice. These non-quantifiable benefits can amount to a higher value than the more obvious tangible benefits. An example of how intangible benefits could be allowed for in project appraisal is shown through the example of Crowther Precision plc.

**Non-quantifiable benefits can amount to a higher value than the more obvious tangible benefits.**

#### Worked example 4.1

#### CROWTHER PRECISION PLC

Crowther Precision plc produces metal parts for the car industry, with machinery that is now more than 20 years old. With appropriate maintenance these machines could continue producing indefinitely. However, developments in the machine tool industry have led to the creation of computer-controlled multi-use machines. Crowther is considering the purchase of the Z200 which would provide both quantifiable and non-quantifiable benefits over the old machine. The Z200 costs £1.2m but would be expected to last indefinitely if maintenance expenditure were increased by £20,000 every year for ever.

The quantifiable benefits are:

- (a) reduced raw material requirements, due to lower wastage, amounting to £35,000 every year for ever;
- (b) labor cost savings of £80,000 every year for ever.

These quantifiable benefits are analyzed using the NPV method.

**Incremental net present value analysis of Z200**

		Present value, £
Purchase of machine		-1,200,000
Present value of all annual raw material savings	$\frac{35,000}{0.1}$	+350,000
Present value of all annual labor savings	$\frac{80,000}{0.1}$	+800,000
Less present value of all annual increased maintenance costs	$\frac{20,000}{0.1}$	-200,000
Net present value		-250,000

*Note:* Assume discount rate of 10%, all cash flows arise at the year ends, zero scrap value of old machine.

Examining the quantifiable elements in isolation will lead to a rejection of the project to buy the Z200. However, the non-quantifiable benefits are:

- reduced time required to switch the machine from producing one version of the car component to one of the other three versions Crowther presently produces;
- the ability to switch the machine over to completely new products in response to changed industry demands, or to take up, as yet unseen, market opportunities in the future;
- improved quality of output leading to greater customer satisfaction.

It is true that the Crowther Precision cash flow analysis has failed to take into account all the relevant factors, but this should not lead to its complete rejection. In cases where non-quantifiable elements are present, the problem needs to be separated into two stages.

- 1** Analyze those elements that are quantifiable using NPV.
- 2** If the NPV from Stage 1 is negative, then managerial judgment will be needed to subjectively assess the non-quantifiable benefits. If these are judged to be greater than the 'loss' signaled in Stage 1 then the project is viable. For Crowther, if the management team consider that the intangible benefits are worth more than £250,000 they should proceed with the purchase of the Z200.

This line of thought is continued in Chapter 19, where operational and strategic decisions with options (real options) are considered. As the article in Exhibit 4.1

shows, the decision to commit to an investment means the loss of options. While reading it you might like to relate the ideas presented to Airbus's commitment to the A380 (Case study 4.1). It is committed, while Boeing has greater freedom to act.

## Tyranny of time

**By their very nature capital investment decisions threaten to place a straitjacket on companies. There is no easy way out.**

Peter Martin

When you make a capital investment decision, you freeze time. In fast-moving industries, this may be the most important aspect of the decision – more important than its actual content. But it is rarely assessed in this light.

There is any amount of theory about how to take capital investment decisions....

All such approaches assume that there are financial and easily quantifiable costs of taking the decision; and less measurable benefits to set against it. The techniques all revolve around ways of making imponderable future benefits more tangible. There is a reason for this: managers usually want to take investment decisions while their superiors usually do not. So the techniques are ever more elaborate ways of capturing the discounted value of blue sky.

But there are also intangible costs of taking the decision, and they are not given the attention they deserve. The cost of freezing time is one of the most important.

Here is how it works. When you make a big capital investment decision, it will usually take between 18 months and five years to bring the plant fully into operation. The cost of tying up capital for that time is reflected in the investment appraisal. But the broader implications of tying up the company are not.

When you have committed yourself to a big new plant, you have not just signed a cheque for the money. You have also sold your soul to this technology, on this scale, in this site. That is

what freezing time means. Until the plant is complete, and it is clear whether it works and whether there is a market for its products, time stands still. For you, but not for your rivals.

They are free to react, to adjust technology, to play around with the pricing and volume. You are not. Unless you have built an implausibly flexible new plant, you are on a convergence course with a straitjacket.

Once your new plant is up and running, you can start to adjust the pattern of its output, and strive to reduce its costs. But until then, your options are more limited: press on, or give up.

The semiconductor industry illustrates this dilemma in a big way. In the mid-1990s, the UK looked like a good home for a bunch of new chip plants. Siemens, LG Group and Hyundai all targeted the British regions for big state-of-the-art factories. One of them – Siemens' factory on Tyneside – opened and promptly shut down again. The other two have never made it into production, and look more questionable by the moment: the Asian crisis undermined their parents and their markets simultaneously.

The decisions all three companies had to make were unenviable, because they were all or nothing. Technology had moved on while the plants were being prepared. Once the Siemens plant came into production, it was clear that it was the wrong plant, making the wrong sort of chip, in the wrong place.

So the company shut it down, at vast cost – only to invest another huge sum in a different plant to make different

chips in France. For LG and Hyundai the moment of decision comes even before they have had the satisfaction of seeing their plants up and running.

The problem is not so much the risk that a plant's technology may prove inappropriate, or that its markets may not meet expectations: these are the normal risks of doing business in a capital intensive industry. It is more that the process of building the factory shuts out other alternatives, freezing the company's options and its internal clock.

What can companies do to avoid this risk? First, look for investment decisions that can be made piece by piece, and implemented quickly, minimising the freezing effect. Engineers usually hate this approach, because it means they are never designing plants at the cutting edge of the technology, or at maximum efficient scale. That's tough.

Second, once an investment has been approved, managers must resist the temptation to make the decision sacrosanct. It needs revisiting, in the light of

changing technology and markets, just as much as plants that are already operating. This is a difficult balance to strike, because every big investment decision usually had to be made in the teeth of the opposition of a faction that wanted something bigger, smaller, older, newer, or somewhere else. This group of dissidents will never be happy with the decision, and they may even be right.

Third, keep a close eye on the relationship between the product cycle time in your industry and the time it takes to get a new plant commissioned.

If the former is shrinking while the latter is lengthening – a common feature of any high-technology industry that has to cater to retail consumers – there will come a point at which the price of freezing time will outstrip the benefits of new plant.

If you cannot keep going by patching the old factory, it is time to think of some revolutionary new process that will replace one big capital investment decision with a lot of small ones. Or give up.

#### EXHIBIT 4.2 Sacrificing options

Source: *Financial Times* 1 June 1999, p. 18

### More tricky issues in real world project appraisal

A fundamental principle in project appraisal is to include only incremental cash flows. These are defined as the cash flows that are dependent on the project's implementation. If a project is accepted only those cash flows which are induced by the investment at time 0 and in subsequent years are regarded as incremental. Some of these cash flows are easy to establish but others are much more difficult to pin down.

$$\boxed{\text{INCREMENTAL CASH FLOW}} = \boxed{\text{CASH FLOW FOR FIRM WITH THE PROJECT}} - \boxed{\text{CASH FLOW FOR FIRM WITHOUT THE PROJECT}}$$

Here are some guide-posts to finding relevant/incremental cash flows:

## Include all opportunity costs

The direct inputs into a project are generally easy to understand and measure. However, quite often a project uses resources which already exist within the firm but which are in short supply and which cannot be replaced in the immediate future. That is, the project under consideration may be taking resources away from other projects. The loss of net cash flows from these other projects are termed opportunity costs. For example, a firm may be considering a project that makes use of a factory that at present is empty. Because it is empty we should not automatically assume that the opportunity cost is zero. Perhaps the firm could engage in the alternative project of renting out the factory to another firm. The forgone rental income is a cost of the project under consideration.

**The project under consideration may be taking resources away from other projects.**

Likewise, if a project uses the services of specialist personnel this may be regarded as having an opportunity cost. The loss of these people to other parts of the organization may reduce cash flows on other projects. If they cannot be replaced then the opportunity cost will be the lost net cash flows. If replacements are found then the extra cost imposed, by the additional salaries, etc., on other projects should be regarded as an opportunity cost of the new project under consideration.

For a third example of opportunity cost, imagine your firm bought a stock of platinum to use as a raw material when the price was low. The total cost was £1m. It would be illogical to sell the final manufactured product at a price based on the old platinum value if the same quantity would now cost £3m. An alternative course of action would be to sell the platinum in its existing state, rather than to produce the manufactured product. The current market value of the raw platinum (£3m) would then be the opportunity cost.

## Include all incidental effects

It is possible for a new project to either increase or reduce sales of other products or services offered by the company. Take the case of an airline company trying to decide whether to go ahead with a project to fly between the USA and Japan. The direct cash flows, of selling tickets, etc. on these flights, may not give a positive NPV. However, it could be that the new service generates additional net revenue not only for US/Japan flights but also on existing routes as customers switch to this airline because it now offers a more complete world-wide service. If this additional net cash flow is included the project may be viable.

If a clothes retailer opens a second or a third outlet in the same town it is likely to find custom is reduced at the original store. The loss elsewhere in the organization becomes a relevant cash flow in the appraisal of the *new* project, that is, the new shop.



In the soft drinks business, the introduction of a new brand can reduce the sales of the older brands. This is not to say that a company should never risk any cannibalization, only that if a new product is to be launched it should not be viewed in isolation. All incremental effects have to be allowed for including those effects not directly associated with the new product or service.

### **The irrelevance of sunk costs**

Do not include sunk costs. For example, the project to build the Concorde involved an enormous expenditure in design and manufacture. At the point where it has to be decided whether or not to put the airplane into service, the costs of development became irrelevant to the decision. Only increment costs and inflows should be considered. The development costs are in the past and are bygones; they should be ignored. The money spent on development is irrecoverable whatever the decision on whether to fly the plane. Similarly with Eurotunnel, the fact that the overspend runs into billions of pounds and the tunnel service is unlikely to make a profit does not mean that the incremental cost of using same electricity to power the trains and the cost of employing train drivers should not be incurred. The £9bn+ already spent is irrelevant to the decision on whether to transport passengers and freight between France and the UK. So long as incremental costs are less than incremental benefits (cash flows when discounted) then the service should operate.

A common mistake in this area is to regard pre-project survey work (market demand screening, scientific study, geological survey, etc.) as a relevant cost.

**A common mistake is to regard pre-project survey work as a relevant cost.**

After all, the cost would not have been incurred but for the possibility of going ahead with the project. However, at the point of decision on whether to proceed, the survey cost is sunk – it will be incurred whether or not implementation takes place, and is therefore not incremental.

Sunk costs can be either costs for intangibles (such as research and development (R&D)), or costs for tangibles that have no other use (such as the costs of the Eurotunnel). When dealing with sunk costs it is sometimes necessary to be resolute in the face of comments such as ‘good money is being thrown after bad’. Always remember the ‘bad’ money outflow happened in the past and is no longer an input factor into a rigorous decision-making process.

### **Be careful with overhead**

Overhead consists of such items as managerial salaries, rent, light, heat, etc. These are costs that are not directly associated with any one part of the firm or one project. An accountant often allocates these overhead costs among the various projects a firm is involved in. When trying to assess the viability of a project we should only include the incremental or extra expenses that would be incurred by going ahead with a project. Many of the general overhead expenses may be incurred regardless of whether or not the project takes place.

There are two types of overhead. The first type is truly incremental costs resulting from a project. For example, extra electricity, rental and administrative staff costs may be incurred by going ahead rather than abstaining. The second type of overhead consists of such items as head office managerial salaries, legal expertise, accounting services, public relations, (R&D) and even the corporate jet. These costs are not directly associated with any one part of the firm or one project and will be incurred whether or not the project under consideration goes ahead. The accountant generally charges a proportion of this overhead to particular divisions and projects. When trying to assess the viability of a project only the incremental costs incurred by going ahead are relevant, those costs which are unaffected are irrelevant.

### Dealing with interest

Interest on funds borrowed to invest does represent a cash outflow, but this element should not be included in the cash flow calculations. **To repeat, interest should not be deducted from the net cash flows.** If it were subtracted this would amount to double counting, because the opportunity cost of capital used to discount the cash flows already incorporates a cost of these funds. The net cash flows are reduced to a present value by allowing for the weighted average cost of finance to give a return to shareholders and lenders. If the undiscounted cash flows also had interest deducted there will be a serious understatement of NPV. For more details on the discount rate incorporating the cost of debt finance (interest) see Chapter 10.

## The stages of investment decision-making

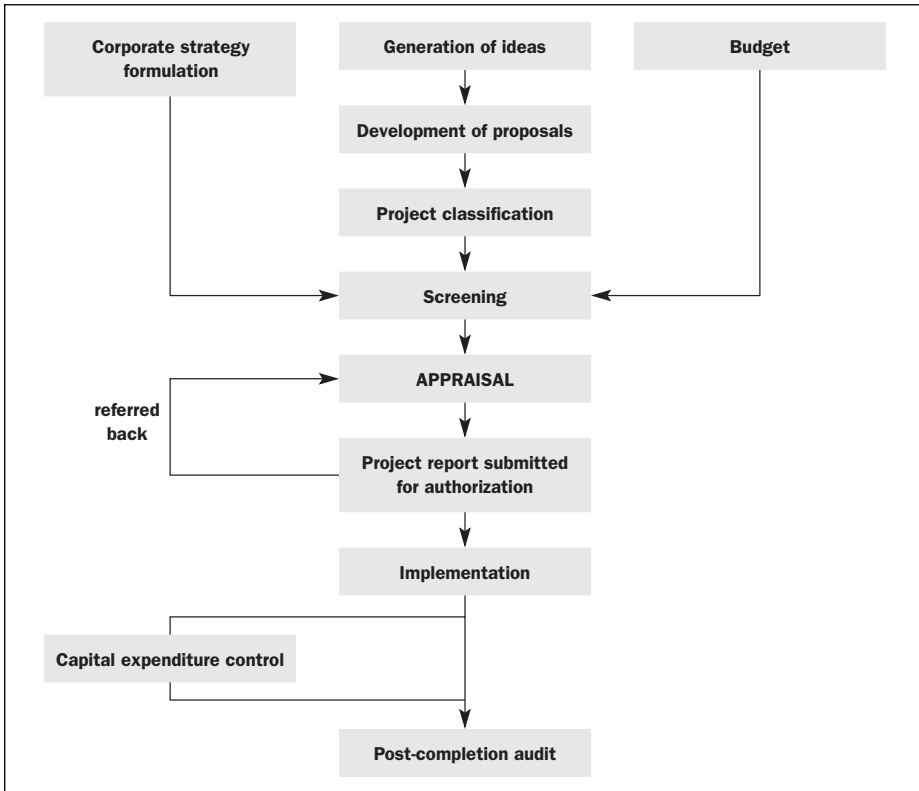
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There is a great deal more to a successful investment program than simply project appraisal. As Figure 4.1 demonstrates, project appraisal is one of a number of stages in the investment process. The emphasis in the academic world on ever more sophistication in appraisal could be seriously misplaced. Attention paid to the evolution of investment ideas, their development and sifting may produce more practical returns. Marrying the evaluation of projects once screened with strategic, resource and human considerations may lead to avoidance of erroneous decisions. Following through the implementation with a review of what went right, what went wrong, and why, may enable better decision-making in the future.

**The emphasis in the academic world on ever more sophistication in appraisal could be seriously misplaced.**

Investment by a firm is a process often involving large numbers of individuals up and down an organizational hierarchy. It is a complex and infinitely adaptable process that is likely to differ from one organization to another. However, we can identify some common threads.

**FIGURE 4.1**  
**The investment process**



## Generation of ideas

A firm is more likely to founder because of a shortage of good investment ideas than because of poor methods of appraisal. A good investment planning process requires a continuous flow of ideas to regenerate the organization through the exploitation of new opportunities. Thought needs to be given to the development of a system for the encouragement of idea generation and subsequent communication through the firm. Indeed, one of the central tasks of senior management is to nurture a culture of search for and sponsorship of ideas. In the absence of a well-functioning system, the danger remains that investment proposals only arise in a reactive manner. For example, a firm examines new product possibilities only when it realizes that the old product is becoming, or has become, obsolete. Or else the latest technology is installed in reaction to its adoption by a competitor. A system and culture is needed to help the firm 'get ahead of the game' and be proactive rather than reactive.

One of the main inputs into a more systematic search for ideas is likely to be an environment scanning process. It is also helpful if all potential idea-generators

are made aware of the general strategic direction of the firm and the constraints under which it operates. Idea generators often become sponsors of their proposals within the organization. These individuals, in a poorly operating system, can see themselves taking a high risk for very little reward. Their reputation and career prospects can be intimately associated with a project. If it goes badly then they may find themselves blamed for that failure. In a system with such poor incentives the natural response of most people would be to hold back from suggesting ideas and pushing them through, and concentrate on day-to-day management. This defensive attitude could be bad for the organization and it is therefore incumbent on senior management to develop reward systems that do not penalize project idea generators and sponsors.

## Development and classification

As the sponsor or the division-level team gather more data and refine estimates, some degree of early filtering takes place. Ideas that may have looked good in theory do not necessarily look so good when examined more closely. In a well-functioning system, idea generation should be propagated in an unstructured, almost random manner, but the development phase starts to impose some degree of order and structure. Many firms like to have a bottom-up approach, with ideas coming from plant level and being reviewed by divisional management before being presented to senior management. At the development stage the sponsor elaborates and hones ideas in consultation with colleagues. The divisional managers may add ideas, ask for information and suggest alternative scenarios. There may also be division-level projects that need further consideration. As the discussions and data gathering progress, the proposal generally starts to gain commitment from a number of people who become drawn in and involved.

**Ideas that may have looked good in theory do not necessarily look so good when examined more closely.**

The classification stage involves matching projects to identified needs. Initially, there may be a long list of imaginative project ideas or solutions to a specific problem, but this may be narrowed down in these early stages to two or three. Detailed evaluation of all projects is expensive. Some types of project do not require the extensive search for data and complex evaluation that others do. The following classification may allow more attention to be directed at the type of project where the need is greatest:

- *Equipment replacement* Equipment obsolescence can occur because of technological developments which create more efficient alternatives, because the old equipment becomes expensive to maintain or because of a change in the cost of inputs, making an alternative method cheaper (for example, if the oil price quadruples, taxi firms may shift to smaller cars).
- *Expansion or improvement of existing products* These investments relate to increasing the volume of output and/or improving product quality and market position.

- *Cost reduction* A continuous process of search and analysis may be necessary to ensure that the firm is producing at lowest cost. Small modifications to methods of production or equipment, as well as the introduction of new machines, may bring valuable incremental benefits.
- *New products* Many firms depend on a regular flow of innovatory products to permit continued expansion. Examples are Intel, GlaxoSmithKline and 3M. These firms have to make huge commitments to R&D, market research and promotion. Vast investments are needed in new production facilities around the world.
- *Statutory and welfare* Investments may be required by law for such matters as safety, or pollution control. These do not, generally, give a financial return and so the focus is usually to satisfy the requirement at minimum cost. Welfare investments may lead to some intangible benefits which are difficult to quantify, such as a more contented work-force. The Arnold and Hatzopoulos (2000) survey showed that 78 percent of the firms undertook non-economic projects directed at health and safety issues; 74 percent accepted projects motivated by legislation; and 54 percent had paid for uneconomic projects for social and environmental reasons.

The management team need to weigh up the value of a more comprehensive analysis against the cost of evaluation. Regular equipment replacement, cost reduction and existing product expansion decisions are likely to require less documentation than a major strategic investment in a new product area. Also, the information needs are likely to rise in proportion to the size of the investment. A £100m investment in a new pharmaceutical plant is likely to be treated differently to a £10,000 investment in a new delivery vehicle.

## Screening

At this stage, each proposal will be assessed to establish whether it is sufficiently attractive to receive further attention through the application of sophisticated analysis. The quality of information is generally rather poor and the payback method may feature predominantly at this point. Screening decisions should be made with an awareness of the strategic direction of the firm and the limitations imposed by the financial, human and other resources available. There should also be a check on the technical feasibility of the proposal and some preliminary assessment of risk.

- *Strategy* Capital allocation is a pivotal part of the overall strategic process. A good investment appraisal system must mesh with the firm's long-term plan. The managers at plant or division level may not be able to see opportunities at a strategic level, such as the benefits of combining two divisions, or the necessity for business unit divestment. The bottom-up flow of ideas for investment at plant level should complement the top-down strategic planning from the center. Each vantage point has a valuable contribution to make.

- *Budget* Most large firms prepare capital budgets stretching over many years. Often a detailed budget for capital expenditure in the forthcoming year is set within the framework of an outline plan for the next five years. Individual projects are required to conform to the corporate budget. However, the budget itself, at least in the long run, is heavily influenced by the availability of project proposals. The Arnold and Hatzopoulos (2000) survey shows the use of budgets by UK firms (*see* Table 4.1).

**TABLE 4.1**  
**Capital expenditure budgets for UK firms**

	Small firms	Medium-sized firms	Large firms
	%	%	%
<i>Outline capital expenditure budgets are prepared for:</i>			
1 year ahead	18	8	–
2 years ahead	18	25	13
3 years ahead	35	50	18
4 years ahead	9	–	5
More than 4 years ahead	21	13	61
Blank	–	4	3
<i>Detailed capital expenditure budgets are prepared for:</i>			
1 year ahead	70	79	55
2 years ahead	21	13	21
3 years ahead	9	4	8
4 years ahead	–	–	5
More than 4 years ahead	–	4	11

Note: 96 firms completed the survey questionnaire.

Source: Arnold and Hatzopoulos (2000)

## Appraisal

It is at the appraisal stage that detailed cash flow forecasts are required as inputs to the more sophisticated evaluation methods, such as net present value. Manuals provide detailed checklists that help the project sponsor to ensure that all relevant costs and other factors have been considered. These manuals may explain how to calculate NPV and IRR and may also supply the firm's opportunity cost of capital. (If risk adjustment is made through the discount rate there may be more than one cost of capital and the sponsor then has to classify the project into, say, high, medium or low risk categories – see Chapter 5.) The project promoter may seek the aid of specialists, such as engineers, accountants and economists, in the preparation of the formal analysis.

## Report and authorization

Many firms require that project proposals are presented in a specific manner through the use of capital appropriation request forms. These detail the nature of the project and the amount of finance needed, together with the forecasted cash inflows and the NPV, IRR, ARR or payback. Some analysis of risk and a consideration of alternatives to the proposed course of action may also be required.

Expenditure below a threshold, say £100,000, will gain authorization at division level, while that above the threshold will need approval at corporate level. At head office a committee consisting of the most senior officers (chairman, chief executive, finance director, etc.) will meet on a regular basis to consider major capital projects. Very few investment proposals are turned down by this committee, mainly because these project ideas will have already been through a number of stages of review and informal discussion up and down the organization, and the obviously non-viable will have been eliminated. Also, even marginally profitable projects may get approval to give a vote of confidence to the sponsoring management team. The alternative of refusal may damage motivation and may cause loss of commitment to developing other projects. If the senior management had had doubts about a proposal they would have influenced the sponsoring division(s) long before the proposal reached the final report stage. In most cases there is a long period of consultation between head office and division managers, and informal pressures to modify or drop proposals can be both more efficient and politically astute ways of proceeding than refusal at the last hurdle.

## Implementation

### Capital expenditure controls

Firms must keep track of investment projects so as to be quickly aware of delays and cost differences compared with the plan. When a project is authorized there is usually a specified schedule of expenditure, and the accountants and senior management will keep a watchful eye on cash outflows. During the installation,

**Senior management will keep a watchful eye on cash outflows.**

purchasing and construction phases, comparisons with original estimates will be made on a periodic basis. Divisions may be permitted to overspend by, say, 10 percent before a formal request for more funds is required.

A careful watch is also kept on any changes to the projected start and completion dates. Deviations from projected cash flows can be caused by one of two factors:

- inaccuracy in the original estimate, that is, the proposal report did not reflect reality perfectly;
- poor control of costs.

It is often difficult to isolate each of these elements. However, deviations need to be identified and explained as the project progresses. This may permit corrective action to be taken to avoid further overspending and may, in extreme circumstances, lead to the cancellation of the project.

### Post-completion audit

Post-completion auditing is the monitoring and evaluation of the progress of a capital investment project through a comparison of the actual cash flows and other costs and benefits with those forecasted at the time of authorization. Companies need a follow-up procedure which examines the performance of projects over a long time span, stretching over many years. It is necessary to isolate and explain deviations from estimated values.

Table 4.2 shows the extent of the use of post-competition audits by UK companies.

**TABLE 4.2**

**Replies to the question: 'Does your company conduct post-audits of major capital expenditure?'**

	Small %	Medium-sized %	Large %	Composite %
Always	41	17	24	28
Sometimes/ on major projects	41	67	71	59
Rarely	12	17	5	10
Never	6	–	–	2

Note: 96 companies responded to the survey.

Source: Arnold and Hatzopoulos (2000)

There are three main reasons for carrying out a post-completion audit:

- *Financial control mechanism* This process helps to identify problems and errors evident in a particular project. A comparison with the original projections establishes whether the benefits claimed prior to approval actually materialize. If a problem is encountered then modifications or abandonment may be possible before it is too late.
- *Insight gained may be useful for future capital investment decisions* One benefit of auditing existing projects is that it might lead to the identification of failings in the capital investment process generally. It may be discovered that data collection systems are inadequate or that appraisal methods are poor. Regular post-completion auditing helps to develop better decision-making. For instance, past appraisals may have paid scant regard to likely competitor reaction; once recognized, this omission will be corrected for in all future evaluations.
- *The psychological effect* If potential project sponsors are aware that implemented proposals are monitored and reviewed they may be encouraged to increase their forecasting accuracy. They may also be dissuaded from playing 'numbers games' with their project submission, designed to draw more resources to their divisions or pet schemes unjustifiably. In addition, they may take a keener interest in the implementation phase.



Senior management must conduct a careful balancing act because the post-completion audit may encourage another sort of non-optimal behavior. For instance, if managers are judged on the extent to which project outcomes exceed original estimates, there will be a tendency to deliberately understate the forecast. Also, if the audit is too inquisitorial, or if it too forcefully apportions blame for results that are only partially under the control of managers, then they may be inclined to suggest only relatively safe projects with predictable outcomes. This may result in a loss of opportunities. Ideally, regular post-completion reviews are needed, but many firms settle for an audit one year after the asset has been put in place. This may be inadequate for projects producing returns over many years. Some firms do manage an annual review of progress, and some even go as far as monthly monitoring during the first year followed by annual reviews thereafter. Many projects involve only minor commitment of resources and are routine in nature. The need for post-completion auditing is not as pressing for these as it would be for strategic projects requiring major organizational resource commitment. Given the costs involved in the auditing process, many firms feel justified in being highly selective and auditing only a small proportion. Another reason for not carrying out a post-completion audit in all cases is the difficulty of disentangling the costs and benefits of a specific project in a context of widespread interaction and interdependence.

## Conclusion

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The typical student of finance will spend a great deal of time trying to cope with problems presented in a mathematical form. This is necessary because these are often the most difficult aspects of the subject to absorb. However, readers

**Managers are often ignorant of the principles behind discounted cash flow techniques.**

should not be misled into thinking that complex computations are at the center of project investment in the practical world of business. Managers are often either ignorant of the principles behind discounted cash flow techniques or choose to stress more traditional rule-of-thumb techniques, such as payback and

accounting rate of return, because of their communicatory or other perceived advantages. These managers recognize that good investment decision-making and implementation require attention to be paid to the social and psychological

**The real art of management is in the process of project creation and selection, not in the technical appraisal stage.**

factors at work within an organization. They also know that formal technical appraisal takes place only after a long process of idea creation and development in a suitably nurturing environment. There is also a long period of discussion and commitment forming, and continuous re-examination and refinement. The

real art of management is in the process of project creation and selection, not in the technical appraisal stage.

# ALLOWING FOR RISK IN PROJECT APPRAISAL

Introduction

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What is risk?

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Adjusting for risk through the discount rate

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Sensitivity analysis

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Scenario analysis

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Probability analysis

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Problems with using probability analysis

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Evidence of risk analysis in practice

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Conclusion

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**Case study 5.1****Two risky ventures . . .****One that will (probably) not pay off . . .****The £200 billion gamble – Wireless Telecommunications**

In 2000 the telecom companies of Europe committed themselves to what may prove to be one of the biggest gambles ever. They agreed to pay £80–£100bn to purchase 3G (third generation) licenses from various European governments. As a result they will be able to offer internet access from mobile phones.

The ‘winners’ of the auctions for licenses will, in addition to handing over thousands of millions to government, have to invest another £100bn building the infrastructure needed to deliver the service to the customer supposedly hungry for internet-enabled phones. By the middle of 2001, so great was the outflow of cash that major telecommunication companies had become burdened with extraordinary amounts of debt. For example, in 1998 BT had debts of roughly £1bn. Over the next three years these rose to over £20bn and serious concern was expressed in the City of London about the excessive debt. Over the same period France Telecom’s debt rocketed to over €63bn and Deutsche Telekom’s went to €60bn. Shares tumbled as shareholders worried that too much was being paid for projects based on a high degree of optimism. Nobody knows whether consumers really want to surf the internet with their phones. Furthermore, the level of competition is likely to be so intense that the companies may lose money even with millions of customers.

Perhaps, as the new technology develops, an application will be discovered that induces consumers rush to pay for and the investment projects turn out to be very rewarding for shareholders. Perhaps the 3G projects will be superseded by new technology (4G?) before they are properly up and running. The truth is that we will not know for many years. Such is the fun and excitement of real world business decisions!

**And one that did . . .****Camelot**

Camelot bid for, and won, the right to create the UK’s national lottery. They invested in a vast computer network linking 30,000 retail outlets and paid for 300 man-years to develop specialized software. Camelot also had to train 91,000 staff to operate the system, which can handle over 30,000 transactions a minute, and spend large amounts on marketing. The gamble seems to have paid off. In 2003 the Camelot produced a pre-tax profit of £42.3m. The owners of Camelot – Cadbury Schweppes, De La Rue, Fujitsu, Thales Electronics and Royal Mail Enterprises – have a political battle on their hands trying to persuade the public and authorities that they took a risk and things happened to turn out well. It could have been so different; they could have made a multi-million pound investment followed by public indifference and enormous losses.

*Source for Camelot: – based on Financial Times, 5 June 1996, Camelot’s annual report 2003.*

## Introduction

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Businesses operate in an environment of uncertainty. The 3G gamble and Camelot examples show that managers can never be sure about what will happen in the future. There is the upside possibility of events turning out to be better than anticipated and the downside possibility of everything going wrong. Implementing an investment project requires acceptance of the distinct possibility that the managers have got it wrong; that the project or enterprise will result in failure. However, to avoid any chance of failure means the adoption of a 'play-safe' or 'do-nothing' strategy. This may itself constitute a worse business sin, that of inertia, and will result in greater failure. There has to be an acceptance of risk and of the potential for getting decisions wrong, but this does not mean that risk cannot be analyzed and action taken to minimize its impact.

## What is risk?

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A key feature of project appraisal is its orientation to the future. Management rarely has precise forecasts regarding the future return to be earned from an investment. Usually the best that can be done is to make an estimate of the range of the possible future inflows and outflows. There are two types of expectations individuals may have about the future: certainty and uncertainty.

- *Certainty* Under expectations of certainty, future outcomes can be expected to have only one value. That is, there is not a variety of possible future eventualities – only one will occur. Such situations are rare, but there are some investments that are a reasonable approximation to certainty, for instance, lending to a reputable government by purchasing three-month Treasury bills. Unless you are very pessimistic and expect catastrophic change over the next three months, such as revolution, war or a major earthquake, then you can be certain of receiving your original capital plus interest. A firm could undertake a project that had almost complete certainty by investing its funds in Treasury bills, and receiving a return of, say, 4 percent per year. Shareholders may not, however, be very pleased with such a low return.
- *Risk and uncertainty* The terms risk and uncertainty are used interchangeably in the subsequent analysis. Strictly speaking, risk occurs when specific probabilities can be assigned to the possible outcomes. Uncertainty applies in cases when it is not possible to assign probabilities. Risk describes a situation where there is not just one possible outcome, but an array of potential returns. Also we assume that we know the probabilities for each of the possible futures. The range and distribution of these possible outcomes may be estimated on the basis of either objective probabilities or subjective probabilities (or a combination of the two).

## Objective probabilities

An objective probability can be established mathematically or from historical data. The mathematical probability of a tossed coin showing a head is 0.5. The probability of taking the Ace of Hearts from a pack of 52 cards is 0.0192 (or 1/52). A probability of 0 indicates nil likelihood of outcome. A probability of 1 denotes that there is absolute certainty that this outcome will occur. A probability of 0.3 indicates that there is an expectation that in three times out of ten this will occur. The probabilities for all possible outcomes must sum to 1. We will now examine an example of an objective probability assessment based on historical data for the supermarket retailer Safeway. If the firm is considering a project that is similar to numerous projects undertaken in the past it may be able to obtain probabilities for future profitability. For instance, Safeway is examining the proposal to build and operate a new supermarket in Birmingham. Because the firm has opened and operated 100 other supermarkets in the past, and has been able to observe their profitability it is able to assign probabilities to the performance of the supermarket it is proposing to build (*see* Table 5.1 and Figure 5.1).

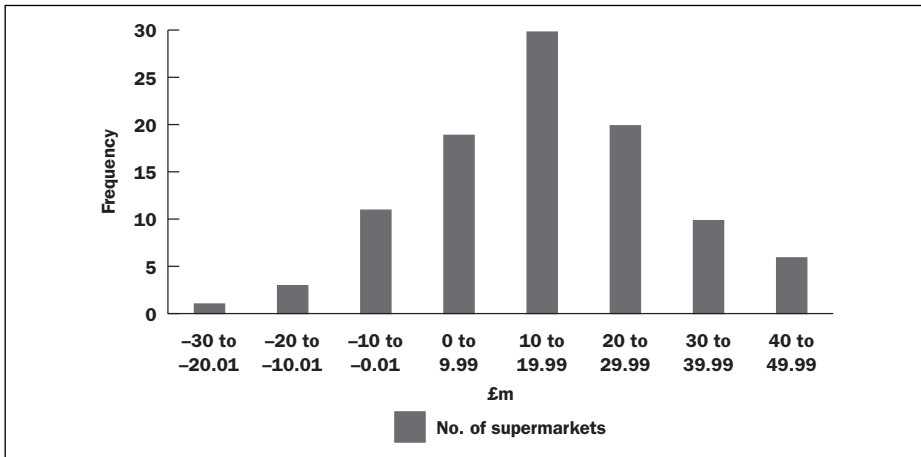
**TABLE 5.1**  
**Safeway's profitability frequency distribution of existing 100 supermarkets**

Profitability range (£m)	Frequency (Number of stores)	Probability
-30 to -20.01	1	0.01
-20 to -10.01	3	0.03
-10 to -0.01	11	0.11
0 to 9.99	19	0.19
10 to 19.99	30	0.30
20 to 29.99	20	0.20
30 to 39.99	10	0.10
40 to 49.99	6	0.06
<b>TOTAL</b>	<b>100</b>	<b>1.00</b>

An examination of this sort of historical record may be a useful first step in the process of making a decision. However, it must be borne in mind that the probabilities may have to be modified to take into account the particular circumstances surrounding the site in Birmingham. For instance, demographic trends, road connections and competitor activity may influence the probabilities for profit or loss. Even with large quantities of historical data there is often still a lot of room for subjective assessment in judging the range of possible outcomes.

**Even with large quantities of historical data there is often still a lot of room for subjective assessment.**

**FIGURE 5.1**  
**Frequency distribution of supermarket profitability**



### Subjective probabilities

In many project assessments there are no past records to help in the creation of the distribution of probabilities profile. For instance, the product may be completely new, or a foreign market is to be entered. In situations like these, subjective probabilities are likely to dominate, that is, personal judgment of the range of outcomes along with the likelihood of their occurrence. Managers, individually or collectively, must assign probability numbers to a range of outcomes.

It must be acknowledged that the probabilities assigned to particular eventualities are unlikely to be entirely accurate and thus the decision-making that follows may be subject to some margin of error. But consider the alternative of merely stating the most likely outcomes. This can lead to less well-informed decisions and greater errors. For example, a firm might be considering two mutually exclusive projects, A and B. Both projects are expected to be shareholder-wealth-enhancing, based on the estimate of the most likely outcome. The most likely outcome for A is for it to be shareholder-wealth-enhancing, with a 95 percent chance of occurrence. Similarly the most likely outcome for B is a shareholder-wealth-enhancing return, with a 55 percent chance of occurrence (*see* Table 5.2).

**TABLE 5.2**  
**Probability outcomes for two projects**

Outcome	Project A probability	Project B probability
Shareholder-wealth-enhancing	0.95	0.55
Not shareholder-wealth-enhancing	0.05	0.45

By using probabilities, a more informed decision is made. The project appraiser has been forced to consider the degree of confidence in the estimate of expected viability. It is clear that Project A is unlikely to fail, whereas Project B has a fairly high likelihood of failure. We will examine in detail the use of probability distribution for considering risk later in the chapter, but now turn to more pragmatic, rule-of-thumb and intuitively easier methods for dealing with project risk.

## Adjusting for risk through the discount rate

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A traditional and still popular method of allowing for risk in project appraisal is the risk premium approach. The logic behind this is simple: investors require a greater reward for accepting a higher risk – the more risky the project the higher the minimum acceptable rate of return. In this approach a number of percentage points (the premium) are added to the risk-free discount rate. (The risk-free rate of return is usually taken from the rate available on government bonds.) The risk-adjusted discount rate is then used to calculate net present value in the normal manner.

An example is provided by Sunflower plc, which adjusts for risk through the discount rate by adding various risk premiums to the risk-free rate depending on whether the proposed project is judged to be low, medium or high risk (*see* Table 5.3). This is an easy approach to understand and adopt, which explains its continued popularity.

### Drawbacks of the risk-adjusted discount rate method

The risk-adjusted discount rate method relies on an accurate assessment of the riskiness of a project. Risk perception and judgment are bound to be, to some

extent, subjective and susceptible to personal bias.

**Risk perception and judgment are subjective and susceptible to personal bias.**

There may also be a high degree of arbitrariness in the selection of risk premiums. In reality it is extremely difficult to allocate projects to risk classes and identify appropriate risk premiums as personal

analysis and casual observation can easily dominate.

## Sensitivity analysis

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The net present values calculated in previous chapters gave a static picture of the likely future outcome of an investment project. In many business situations it is desirable to generate a more complete and realistic impression of what may happen to NPV in conditions of uncertainty. Net present value calculations rely on the appraiser making assumptions about some crucial variables: for example

**TABLE 5.3**  
**Adjusting for risk – Sunflower plc**

Level of risk	Risk-free rate (%)	Risk premium (%)	Risk-adjusted rate (%)
Low	9	+3	12
Medium	9	+6	15
High	9	+10	19
<i>The project currently being considered has the following cash flows:</i>			
Point in time (yearly intervals)	0	1	2
Cash flow (£)	-100	55	70
<i>If the project is judged to be low risk:</i>			
NPV =	$-100 + \frac{55}{1 + 0.12} + \frac{70}{(1 + 0.12)^2} = +£4.91$		<b>Accept</b>
<i>If the project is judged to be medium risk:</i>			
NPV =	$-100 + \frac{55}{1 + 0.15} + \frac{70}{(1 + 0.15)^2} = +£0.76$		<b>Accept</b>
<i>If the project is judged to be high risk:</i>			
NPV =	$-100 + \frac{55}{1 + 0.19} + \frac{70}{(1 + 0.19)^2} = -£4.35$		<b>Reject</b>

the sale price of the product, the cost of labor and the amount of initial investment are all set at single values for input into the formula. It might be enlightening to examine the degree to which the viability of the project changes, as measured by NPV, as the assumed values of these key variables are altered. An interesting question to ask might be: If the sale price is raised by 10 percent, by what percentage would NPV increase? In other words, it would be useful to know how sensitive NPV is to changes in component values. Sensitivity analysis is essentially a 'what-if' analysis – for example, what if labour costs are 5 percent lower? or, What if the raw materials double in price? By carrying out a series of calculations it is possible to build up a picture of the nature of the risks facing the project and their impact on project profitability. Sensitivity analysis can identify the extent to which variables may change before a negative NPV is produced. A series of 'what-if?' questions are examined in the example of Acmart plc.



### Worked example 5.1

#### ACMART PLC

Acmart plc has developed a new product line called Marts. The marketing department in partnership with senior managers from other disciplines have estimated the likely demand for Marts at 1,000,000 per year, at a price of £1, for the four-year life of the project. (Marts are used in mobile telecommunications relay stations and the market is expected to cease to exist or be technologically superseded after four years.)

If we can assume perfect certainty about the future then the cash flows associated with Marts are as set out in Table 5.4:

**TABLE 5.4**

#### Cash flows of Marts

Initial investment	£800,000	
Cash flow per unit		£
Sale price		1.00
Costs		
Labor	0.20	
Materials	0.40	
Relevant overhead	0.10	
		(0.70)
Cash flow per unit		<u>0.30</u>

The finance department have estimated that the appropriate required rate of return on a project of this risk class is 15 percent. They have also calculated the expected net present value.

$$\text{Annual cash flow} = 30\text{p} \times 1,000,000 = \text{£}300,000.$$

Present value of annual cash flows

$$= 300,000 \times \text{annuity factor for 4 years @ 15\%}$$

$$= 300,000 \times 2.855 \quad \text{£} \quad = 856,500$$

$$\text{Less initial investment} \quad \quad \quad \underline{-800,000}$$

$$\text{Net present value} \quad \quad \quad \underline{\underline{+56,500}}$$

The finance department are aware that when the proposal is placed before the capital investment committee they will want to know how the project NPV changes if certain key assumptions are altered. As part of the report the finance team ask some 'what-if?' questions and draw a sensitivity graph.

- *What if the price achieved is only 95p (5% below the expected £1) for sales of 1m units (all other factors remaining constant)?*

Annual cash flow =  $25p \times 1m = \pounds 250,000$ .

	£
$250,000 \times 2.855$	713,750
Less initial investment	<u>800,000</u>
Net present value	<u>-86,250</u>

- *What if the price rose by 1%?*

Annual cash flow =  $31p \times 1m = \pounds 310,000$ .

	£
$310,000 \times 2.855$	885,050
Less initial investment	<u>800,000</u>
Net present value	<u>+85,050</u>

- *What if the quantity demanded is 5% more than anticipated?*

Annual cash flow =  $30p \times 1.05m = \pounds 315,000$ .

	£
$315,000 \times 2.855$	899,325
Less initial investment	<u>800,000</u>
Net present value	<u>+99,325</u>

- *What if the quantity demanded is 10% less than expected?*

Annual cash flow =  $30p \times 900,000 = \pounds 270,000$ .

	£
$270,000 \times 2.855$	770,850
Less initial investment	<u>800,000</u>
Net present value	<u>-29,150</u>

- *What if the appropriate discount rate is 20% higher than originally assumed (that is, it is 18% rather than 15%)?*

$300,000 \times$  annuity factor for 4 years @ 18%.

	£
$300,000 \times 2.6901$	807,030
Less initial investment	<u>800,000</u>
	<u>+7,030</u>

- *What if the discount rate is 10% lower than assumed (that is, it becomes 13.5%)?*

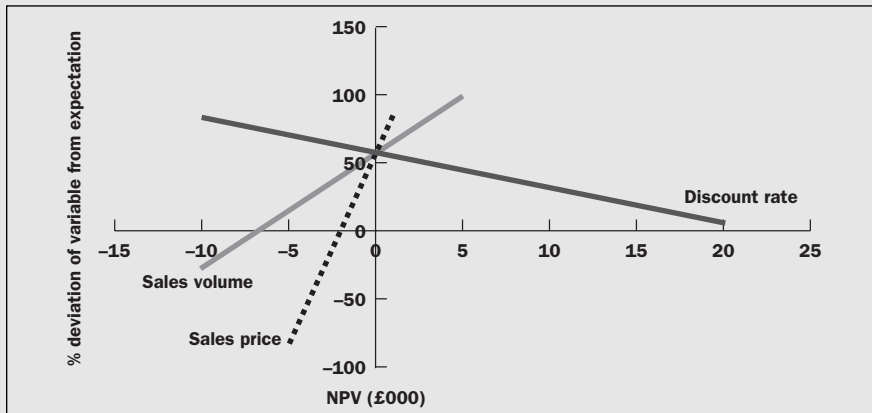
$300,000 \times$  annuity factor for 4 years @ 13.5%.

	£
$300,000 \times 2.944$	883,200
Less initial investment	<u>800,000</u>
	<u>+83,200</u>

These findings can be summarized more clearly in a sensitivity graph (see Figure 5.2).

An examination of the sensitivity graph gives a clear indication of those variables to which NPV is most responsive. This sort of technique can then be extended to consider the key factors that might cause a project to become unviable. This allows the management team to concentrate their analysis, by examining in detail the probability of actual events occurring which would alter the most critical variables. They may also look for ways of controlling the factors to which NPV is most sensitive in any future project implementation. For example, if a small change in material costs has a large impact, the managers may investigate ways of fixing the price of material inputs.

**FIGURE 5.2**  
Sensitivity graph for Marts



**The break-even NPV**

The break-even point, where NPV is zero, is a key concern of management. If the NPV is below zero the project is rejected; if it is above zero it is accepted.

The finance team at Acmart now calculate the extent to which some of the variables can change before the decision to accept changes to a decision to reject. (We will not go through all the possible variables.)

- **Initial investment.** If this rises by £56,500 NPV will be at zero (i.e. Break-even NPV). A percentage increase of:

$$\frac{£56,500}{£800,000} \times 100 = 7.06\%$$

- **Sales price.** The cash flow per unit (after costs),  $c$ , can fall to 28p before break-even is reached:

$$800,000 = c \times 1,000,000 \times 2.855$$

$$c = \frac{800,000}{2.855 \times 1,000,000} = 0.2802$$

Thus the price can decline by only 2% from the original price of £1. An alternative approach is to look up the point at which the sales price line crosses the NPV axis in the sensitivity graph.

- **Material cost** If the cash flow per unit can fall to 28p before break-even is reached, 2p can be added to the price of materials before the project produces a negative net present value (assuming all other factors remain constant). In percentage terms the material cost can rise by 5%  $((2 \div 40) \times 100)$  before break-even is reached.

- **Discount rate** We need to calculate the annuity factor that will lead to the four annual inflows of £300,000 equaling the initial outflow of £800,000 after discounting.

$$300,000 \times \text{annuity factor} = 800,000$$

$$\text{Annuity factor (four-year annuity)} = 800,000/300,000 = 2.667$$

The interest rate corresponding to a four-year annuity factor of 2.667 is approximately 18.5%. This is a percentage rise of 23.33%.

$$\frac{18.5 - 15}{15} \times 100 = 23.33$$

This project is relatively insensitive to a change in the discount rate but highly responsive to a change in the sales price. This observation may lead the managers to request further work to improve the level of confidence in the sales projections.

## Advantages of using sensitivity analysis

Sensitivity analysis has the following advantages:

- **Information for decision-making** At the very least it allows the decision-makers to be more informed about project sensitivities, to know the room they have for judgmental error and to decide whether they are prepared to accept the risks.
- **To direct search** It may lead to an indication of where further investigation might be worthwhile. The collection of data can be time consuming and expensive; if sensitivity analysis points to some variables being more crucial than others, then search time and money can be concentrated.

- *To make contingency plans* During the implementation phase of the investment process the original sensitivity analysis can be used to highlight those factors that have the greatest impact on NPV. Then these parameters can be monitored for deviation from projected values. The management team can draw on contingency plans if the key parameters differ significantly from the estimates. For example, a project may be highly sensitive to the price of a bought-in component. The management team after recognizing this from the sensitivity analysis prepare contingency plans to: (a) buy the component from an alternative supplier, should the present one increase prices excessively, (b) produce the component in-house, or (c) modify the product so that a substitute component can be used. Which of the three is implemented, if any, will be decided as events unfold.

### Drawbacks of sensitivity analysis

The absence of any formal assignment of probabilities to the variations of the parameters is a potential limitation of sensitivity analysis. For Marts the discount rate can change by 23.33 percent before break-even NPV is reached, whereas the price can only change by 2 percent. At first glance, you would conclude that NPV is more vulnerable to the price changes than to variability in the discount rate. However, if you are now told that the market price for Marts is controlled by government regulations and there is a very low probability of the price changing, whereas the probability of the discount rate rising by more than 23.33 percent is high, you might change your assessment of the nature of the relative risks. This is another example where following the strict mathematical formula is a poor substitute for judgment. At the decision-making stage the formal sensitivity analysis must be read in the light of subjective or objective probabilities of the parameter changing.

**Strict mathematical formula is a poor substitute for judgment.**

A drawback of sensitivity analysis is that each variable is changed in isolation while all other factors remain constant. In the real world it is perfectly possible that a number of factors will change simultaneously. For example, if inflation is higher then both anticipated selling prices and input prices are likely to be raised. The next section presents a partial solution to this problem.

### Scenario analysis

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With sensitivity analysis we change one variable at a time and look at the result. Managers may be especially concerned about situations where a number of factors change. They are often interested in establishing a worst-case/best-case scenario. That is, what NPV will result if all the assumptions made initially turned out to be too optimistic? And, what would be the result if, in the event, matters went extremely well on all fronts?

Table 5.5 describes a worst-case/best-case scenario for Marts.

**TABLE 5.5**

**Acmart plc: Project proposal for the production of Marts – worst-case and best-case scenarios**

<b>Worst-case scenario</b>		
Sales		900,000 units
Price		90p
Initial investment		£850,000
Project life		3 years
Discount rate		17%
Labor costs		22p
Material costs		45p
Overhead		11p
Cash flow per unit		£
Sale price		0.90
Costs		
Labor	0.22	
Material	0.45	
Overhead	<u>0.11</u>	
		<u>0.78</u>
Cash flow per unit		0.12
		£
Annual cash flow = $0.12 \times 900,000 =$		£108,000
Present value of cash flows $108,000 \times$ annuity factor		238,637
(annuity factor 3 years @ 17%) $108,000 \times 2.2096$		
Less initial investment		<u>-850,000</u>
Net present value		-611,363
<b>Best-case scenario</b>		
Sales		1,200,000 units
Price		120p
Initial investment		£770,000
Project life		4 years
Discount rate		14%
Labor costs		19p
Material costs		38p
Overhead		9p

<b>Cash flow per unit</b>		<b>£</b>
Sale price		1.20
Costs		
Labor	0.19	
Material	0.38	
Overhead	<u>0.09</u>	
		<u>0.66</u>
Cash flow per unit		0.54

Annual cash flow =  $0.54 \times 1,200,000 = \text{£}648,000$

		<b>£</b>
Present value of cash flows $648,000 \times$ annuity factor (4 years @ 14%)	$648,000 \times 2.9137$	1,888,078
Less initial investment		<u>-770,000</u>
Net present value		<u>1,118,07</u>

Having carried out sensitivity, break-even NPV and scenario analysis the management team have a more complete picture of the project. They then need to apply the vital element of judgment to make a sound decision.

## Probability analysis

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A further technique to assist the evaluation of the risk associated with a project is to use probability analysis. If management have obtained, through a mixture of objective and subjective methods, the probabilities of various outcomes this will help them to decide whether to go ahead with a project or to abandon the idea. We will look at this sort of decision-making for the firm Pentagon plc.

Pentagon plc is trying to decide between five mutually exclusive one-year projects (*see* Table 5.6).

Proposals 1 and 2 represent perfectly certain outcomes. Project 2 has a higher NPV and is the obvious preferred choice. In comparing Project 2 with Projects 3, 4 and 5 we have a problem: which of the possible outcomes should we compare with Project 2's outcome of £20m? Take Project 3 as an example. If the outcome is -£16m then clearly Project 2 is preferred. However, if the outcome is £36m, or even better, £48m, then Project 3 is preferred to Project 2.

**TABLE 5.6**  
**Pentagon plc: Use of probability analysis**

	Net present value, NPV	Probability of return occurring
Project 1	16	1.0
Project 2	20	1.0
Project 3 Recession	-16	0.25
Growth	36	0.50
Boom	48	0.25
Project 4 Recession	-8	0.25
Growth	16	0.50
Boom	24	0.25
Project 5 Recession	-40	0.10
Growth	0	0.60
Boom	100	0.30

### Expected return

A tool that will be useful for helping Pentagon choose between these projects is the expected NPV. This is the mean or average outcome calculated by weighting each of the possible outcomes by the probability of occurrence and then summing the result. That is, multiply the outcome by the probability expressed as a number between 0 and 1; then, add up all the numbers calculated. This is shown in Table 5.7.

The preparation of probability distributions gives the management team some impression of likely outcomes. The additional calculation of expected NPVs adds a further dimension to the informed vision of the decision-maker. Looking at expected NPVs is more enlightening than simply examining the single most likely outcome, which is significantly different from the expected NPV of £26m. For Project 5 the most likely outcome of 0 is not very informative and does not take into account the range of potential outcomes.

It is important to appreciate what these statistics are telling you. The expected NPV represents the outcome expected if the project is undertaken many times. If Project 4 is undertaken 1,000 times, then on average the NPV will be £12m. If the project is undertaken only once, as is the case in most business situations, there would be no guarantee that the actual outcome would equal the expected outcome.



TABLE 5.7

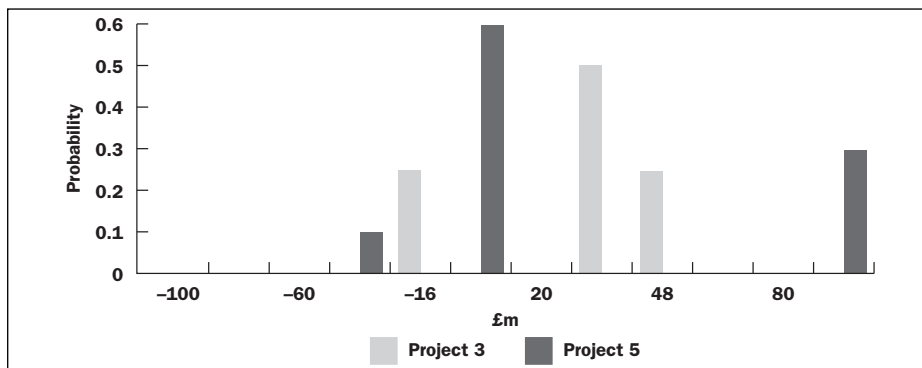
## Pentagon plc: Expected NPV

Pentagon plc		Expected NPV, £m
Project 1	$16 \times 1$	16
Project 2	$20 \times 1$	20
Project 3	$-16 \times 0.25 = -4$	26
	$36 \times 0.50 = 18$	
	$48 \times 0.25 = \underline{12}$	
Project 4	$-8 \times 0.25 = -2$	12
	$16 \times 0.50 = 8$	
	$24 \times 0.25 = \underline{6}$	
Project 5	$-40 \times 0.1 = -4$	26
	$0 \times 0.6 = 0$	
	$100 \times 0.3 = \underline{30}$	

The projects with the highest expected NPV turn out to be Projects 3 and 5, each with an expected NPV of 26. However, we cannot get any further in our decision-making by using just the expected NPV formula, because the formula fails to take account of risk. Risk is concerned with the likelihood that the actual performance might diverge from what is expected. Note that risk in this context has both positive and negative possibilities of diverging from the mean, whereas in everyday speech 'risk' usually has only negative connotations. If we plot the possible outcomes for Projects 3 and 5 against their probabilities of occurrence we get an impression that the outcome of Project 5 is more uncertain than the outcome of Project 3 (*see* Figure 5.3).

FIGURE 5.3

## Pentagon plc: Probability distribution for Projects 3 and 5



The range of possible outcomes is relatively narrow for Project 3 and presents an impression of lower risk. This is only a general indication. We need a more precise measurement of the dispersion of possible outcomes. This is provided by the standard deviation.

### Standard deviation

The standard deviation,  $\sigma$ , is a statistical measure of the dispersion around the expected value. To calculate the standard deviation we first need to calculate the variance; then take the square root of the variance,  $\sigma^2$ .

Calculating the variance is straightforward if you take it in stages:

- Stage 1:** First obtain the deviation of each potential outcome from the expected outcome ( $x_i - \bar{x}$ ). So, in the case of Project 3 the first outcome is  $-16$  (this is our  $x_i$ ) and the expected outcome ( $\bar{x}$ ) is  $26$ . So, subtracting the second number from the first we have  $-42$ .
- Stage 2:** Square the result from stage one for each of the outcomes  $(x_i - \bar{x})^2$ . So, for the first outcome of Project 3 we take the  $-42$  and multiply by itself:  $-42 \times -42 = 1,764$ .
- Stage 3:** Multiply the number generated in stage 2 by the probability of that outcome occurring. In the case of the first outcome of Project 3 we multiply  $1,764$  by  $0.25 = 441$ . That is,  $(x_i - \bar{x})^2 p_i$ .
- Stage 4:** Finally, add together the results of all these calculations for that particular project. So, for Project 3 we add  $441$  to  $50$  to  $121$ . Which gives a variance of  $612$  (see Table 5.8).

Note that the variance is a very large number compared with the original potential outcome: for Project 3 these were  $-16$ ,  $36$  and  $48$ , whereas the variance is over  $600$ , because the variance measures in pounds squared or NPVs squared, etc. The next stage is to obtain the standard deviation,  $\sigma$ , by taking the square root of the variance. This measures variability around the expected value in straightforward pound or return terms. The standard deviation provides a common yardstick to use when comparing the dispersions of possible outcomes for a number of projects. So, for Project 3 the standard deviation is  $24.7$ .

**TABLE 5.8****Pentagon plc: Calculating the standard deviations for the five projects**

	Outcome (NPV)	Probability	Expected NPV, £m	Deviation	Deviation squared	Deviation squared times probability
Project	$x_i$	$p_i$	$\bar{x}$	$x_i - \bar{x}$	$(x_i - \bar{x})^2$	$(x_i - \bar{x})^2 p_i$
1	16	1.0	16	0	0	0
2	20	1.0	20	0	0	0
3	-16	0.25	26	-42	1,764	441
	36	0.5	26	10	100	50
	48	0.25	26	22	484	121
				Variance		= 612
				Standard deviation		= 24.7
4	-8	0.25	12	-20	400	100
	16	0.5	12	4	16	8
	24	0.25	12	12	144	36
				Variance		= 144
				Standard deviation		= 12
5	-40	0.1	26	-66	4,356	436
	0	0.6	26	-26	676	406
	100	0.3	26	74	5,476	1,643
				Variance		= 2,485
				Standard deviation		= 49.8

If we now put together the two sets of measurements about the five projects we might be able to make a decision on which one should be selected (*see* Table 5.9).

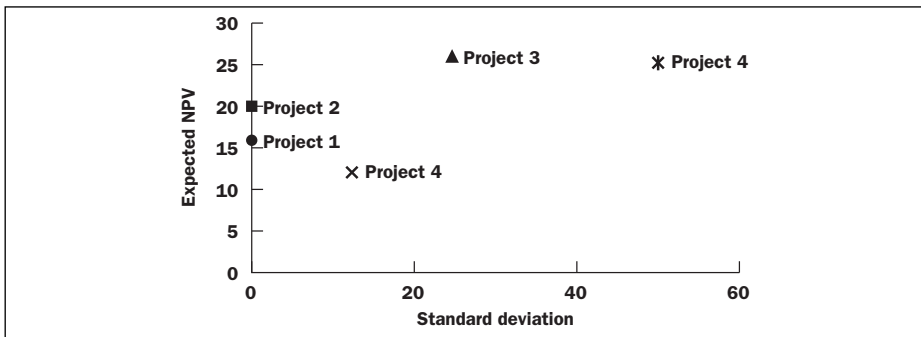
**TABLE 5.9****Pentagon plc: Expected NPV and standard deviation**

	Expected NPV, $\bar{x}$	Standard deviation, $\sigma$
Project 1	16	0
Project 2	20	0
Project 3	26	24.7
Project 4	12	12
Project 5	26	49.8

Project 1 would not, presumably, be chosen by anyone because it is dominated by Project 2. Also, Project 4 is obviously inferior to Project 2 because it has both a lower expected NPV and it is more risky (as defined by its higher standard deviation). That leaves us with Projects 2, 3 and 5. To choose between these we need to think about attitudes to the risk return trade off. Most people and organizations when faced with two projects offering the same NPV (expected NPV) but different levels of risk (variability around the expected NPV) would choose the less risky option. This assumption of *risk aversion* allows us to eliminate Project 5 because it offers the same expected NPV as Project 3, but it has a higher standard deviation.

**FIGURE 5.4**

**Pentagon plc: Expected NPVs and standard deviations**



Projects 1, 4 and 5 are recognizably inferior, leaving a choice between Projects 2 and 3. From this point on there is no simple answer. The solution depends on the risk-return preferences of the decision-maker. This is fundamentally a matter for subjective judgment and different management teams will make different choices. When the author has put the choice between Projects 2 and 3 to MBA classes of middle and senior managers, approximately one-half take the safe option of Project 2. However, others in the class say that for the sake of a little more risk, Project 3 gives a significantly higher NPV and so should be accepted. The board of directors of Pentagon need to weigh up the risk preferences of the owners of the company and choose one project or the other. In doing so they may like to consider how this new project fits with the rest of the company's projects. If the firm already has a broad set of projects (operations, strategic business units, product lines, etc.) and many of these projects tend to do well in circumstances when Project 3 does badly, and *vice versa*, they may consider the benefits of diversification make them inclined to accept this investment.

## Problems with using probability analysis

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### Too much faith can be placed in quantified subjective probabilities

When dealing with events occurring in the future, managers can usually only make informed guesses as to likely outcomes and their probabilities of occurrence. A danger lies in placing too much emphasis on analysis of these subjective estimates once they are converted to numerical form. It is all too easy to carry out detailed computations with accuracy to the  $n^{\text{th}}$  degree, forgetting that the fundamental data usually have a small objective base. Again, mathematical purity is no substitute for thoughtful judgment.

The alternative to the assignment of probabilities, that of using only the most likely outcome estimate in the decision-making process, is both more restricted in vision and equally subjective. At least probability analysis forces the decision-maker to explicitly recognize a range of outcomes and the basis on which they are estimated, and to express the degree of confidence in the estimates.

### Too complicated

Investment decision-making and subsequent implementation often require the understanding and commitment of large numbers of individuals. Probability analysis can be a poor communication tool if important employees do not understand what the numbers mean. Perhaps here there is a need for education combined with good presentation.

**Probability analysis can be a poor communication tool if important employees do not understand what the numbers mean.**

### Projects may be viewed in isolation

The context of the firm may be an important variable, determining whether a single project is too risky to accept, so a project should never be viewed in isolation. Take a firm with a large base of stable low-risk activities. It may be willing to accept a high-risk project because the overall profits might be very large and even if the worst happened the firm will survive. On the other hand, a small firm that already has one highly risky activity may only accept further proposals if they are low risk.

## Evidence of risk analysis in practice

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UK firms have increased the extent of risk analysis in project appraisal over the past 20 years. Table 5.10 summarizes these techniques. This trend has been encouraged by a greater awareness of the techniques and aided by the availabil-

ity of computing software. Sensitivity and scenario analysis remain the most widely adopted approaches. Probability analysis is now used more widely than in the past but few smaller firms use it on a regular basis. Beta analysis, based on the capital-asset pricing model (discussed in Chapter 10) is rarely used. Simple, rule-of-thumb approaches have not been replaced by the more complex methods. Firms tend to be pragmatic and to use a number of techniques in a complementary fashion.

**TABLE 5.10**  
Risk analysis techniques used in UK firms

	Small %	Medium %	Large %	Total %
Sensitivity/scenario analysis	82	83	89	85
Shorten the payback period	15	42	11	20
Raise the required rate of return	42	71	50	52
Probability analysis	27	21	42	31
Beta analysis	3	0	5	3
Subjective assessment	44	33	55	46

Source: Arnold and Hatzopoulos (2000), sample of 96 firms: 34 small, 24 medium, 38 large. Survey date July 1997.

## Conclusion

This chapter has dealt with some of the more sophisticated aspects of project analysis. It has, hopefully, encouraged the reader to consider a wider range of factors when embarking on investment appraisal. Greater realism and more information clears away some of the fog which envelops many capital investment decision-making processes.

**Human communication, enthusiasm and commitment are as vital to investment returns as assessing risk correctly.**

However, this chapter has focussed primarily on the technical/mathematical aspects of the appraisal stage of the investment process sequence. While these aspects should not be belittled, as we ought to

improve the analysis wherever we can, it should be noted that a successful program of investment usually rests far more on quality management of other stages in the process. Issues of human communication, enthusiasm and commitment are as vital to investment returns as assessing risk correctly.



# Section II:

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## SHAREHOLDER VALUE





## VALUE MANAGED VS EARNINGS MANAGED COMPANIES

Introduction

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The pervasiveness of the value approach

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Case studies: FT100 companies creating and  
destroying value

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Why shareholder value?

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Three steps to value

---

Earnings-based management's failings

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Return on capital employed has failings

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Focussing on earnings is not the same as value

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How a business creates value

---

The five actions for creating value

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Conclusion

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## Introduction

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The first few chapters of this book linked together the objective of shareholder wealth maximization and acceptance or otherwise of proposed projects. This required knowledge of the concepts of the time value of money and the opportunity cost of investors' funds placed into new investments. If managers fail to achieve returns at least as high as those available elsewhere for the same level of risk then, as agents for investors, they are failing in their duty. If a group of investors place £1m in the hands of managers who subsequently generate annual returns of 10 percent those managers would in effect be destroying value for those investors if, for the same level of risk, a 14 percent return is available elsewhere. With a future project the extent of this value destruction is summarized in the projected negative NPV figure.

This technique, and the underlying concepts, are well entrenched throughout modern corporations. However, the full potential of their application is only now dawning on a few particularly progressive organizations. Applying the notion of opportunity cost of capital and focussing on the cash flow of new projects rather than profit figures is merely skimming the surface. Since the mid-1980s a growing band of corporations, ranging from Pepsi in the USA to LloydsTSB bank in the UK, have examined their businesses in terms of the following questions:

- How much money has been placed in this business by investors?
- What rate of return is being generated for those investors?
- Is this sufficient given the opportunity cost of capital?

These questions can be asked about past performance or about future plans. They may be asked about the entire organization or about a particular division, strategic business unit or product line. If a line of business does not create value on the capital invested by generating a return greater than the minimum required then managerial attention can be directed to remedying the situation. Ultimately every unit should be contributing to the well-being of shareholders.

## The pervasiveness of the value approach

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The examination of an organization to identify the sources of value may not seem particularly remarkable to someone who has absorbed the concepts discussed in Chapters 1 to 5, but to many managers steeped in the traditions of accounting-based performance measures such as profits, return on investment and earnings per share, they have revolutionary consequences.

The ideas themselves are not revolutionary or even particularly new. It is the far-reaching application of them to create a true shareholder-value-oriented company that can revolutionize almost everything managers do.

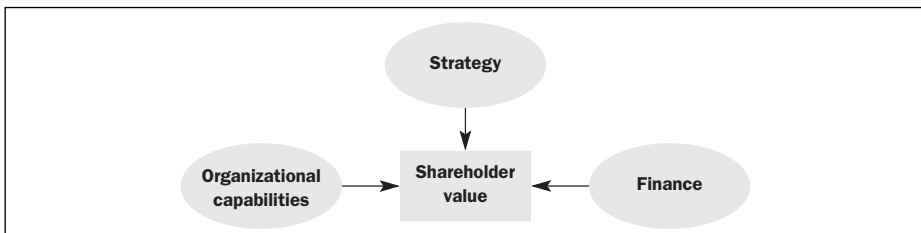
- Instead of working with *plans* drawn up in terms of accounting budgets, with their associated distorted and manipulable view of ‘profit’ and ‘capital investment’, managers are encouraged to think through the extent to which their new strategies or operational initiatives will produce what shareholders are interested in: a discounted inflow of cash greater than the cash injected.
- Instead of being *rewarded* in terms of accounting rates of return (and other ‘non-value’ performance measures, such as earnings per share and turnover) achieved in the short term, they are rewarded by the extent to which they contribute to shareholder value over a long-term horizon. This can radically alter the incentive systems in most firms.
- Instead of directors accepting a low *cash flow on the (market value of) assets tied up* in a poorly performing subsidiary because the accounting profits look satisfactory, they are forced to consider whether greater wealth would be generated by either closure and selling off the subsidiary’s assets or selling the operation to another firm which can make a more satisfactory return.
- There then follows a second decision: should the cash released be invested in other activities or be given back to shareholders to invest elsewhere in the stock market? The answers when genuinely sought can sometimes be uncomfortable for executives who prefer to expand rather than contract the organization.

Dealing with such matters is only the beginning once an organization becomes value based. Mergers must be motivated and evaluated on the criterion of the extent to which a margin above the cost of capital can be achieved given the purchase price. Strategic analysis does not stop at the point of often vague and woolly qualitative analysis, it goes on to a second phase of valuation of the strategies and quantitative sensitivity analysis. The decisions on the most appropriate debt levels and the dividend payout ratios have as their core consideration the impact on shareholder wealth. In the field of human resources, it is accepted that all organizations need a committed workforce. But committed to what? Shareholder value-based management provides an answer, but also places an onus on managers to communicate, educate and convert everyone else to the process of value creation. This may require a shift in culture, in systems and procedures as well as a major teaching and learning effort.

Value-based management brings together the way in which shares are valued by investors with the strategy of the firm, its organizational capabilities and the finance function (see Figure 6.1).

**FIGURE 6.1**

**Components of shareholder value-based management**



Value-based management is much more than a technique employed by a few individuals who are 'good with numbers'. The principles behind it must pervade the organization – it touches almost all aspects of organizational life.

Value-based management is a managerial approach in which the primary purpose is long-run shareholder wealth maximization. The objective of the firm, its systems, strategy, processes, analytical techniques, performance measurements and culture have as their guiding objective shareholder wealth maximization.

**The objective of the firm, its systems, strategy and culture have as their guiding objective shareholder wealth maximization.**

The example of German companies (*see* Exhibit 6.1) shows that a switch to shareholder value-based management can have dramatic consequences.

## The monoliths stir

**A wave of corporate restructuring is sweeping across Germany in response to the growing pressures of global competition, writes Haig Simonian**

'Shareholder value' has become a driving force in German boardrooms. Conglomerates could once justify unwieldy structures, poor earnings and cross subsidisation between profitable and loss-making businesses by saying they were pursuing long-term goals. This stance tended to be compared favourably with the 'short termism' of industrial rivals in the UK or US.

The argument sometimes had merits, but it was also used as an excuse for inactivity. It has been harder to make the same claim in the face of rising shareholder pressure. This has partly come from German investors, but has been led by the US and UK institutions that have increasingly diversified investments outside their domestic stock market.

The pressure for improved profitability and consistency of dividends has led to greater pressure on operations within larger underperforming industrial groups. At Daimler-Benz, Mr Schrempp has required every business to make a return of 12 per cent on capital employed or face closure. Mr Esser of Mannesmann

has set an internal target of 15 per cent return on capital for his group next year.

The demand for higher profits has forced many company chairmen to reassess the breadth of their activities. Not all have been as Draconian as Mr Schrempp, but there has been a widespread move to identify activities with the most potential, and try either to improve or to sell less promising ones.

'We have to think what is best for business, and of creating value for the shareholders,' says Mr Esser about Mannesmann's demerger plan . . .

Heinrich von Pierer, Siemens chairman, wants to shed the group's reputation for conservatism by divesting almost one-seventh of its businesses, with sales of about DM17bn. Earlier this year, he said three of its four lossmaking operations would break even within a year, and launched plans to float a number of subsidiaries. 'It's only in the past year that they have started to take shareholder value really seriously,' says Mr Berger.

### EXHIBIT 6.1 The monoliths stir

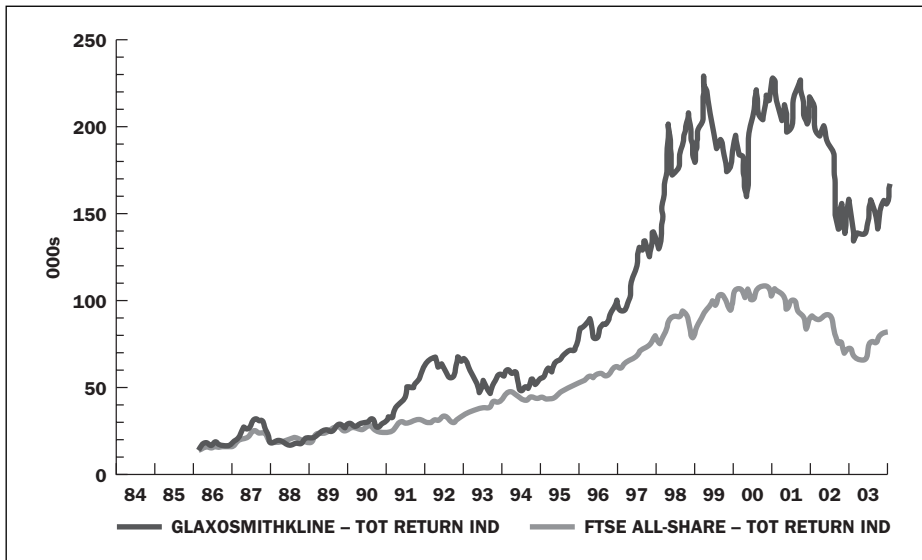
Source: *Financial Times*, 28 September 1999

## Case studies: FTSE100 companies creating and destroying value

We will start by taking a brief look at three companies. One has successfully created vast amounts of value for shareholders, one has destroyed shareholder value over a long period and one is trying to convert itself from a value destroyer to a value creator.

GlaxoSmithKline (GSK) has been a terrific share over 10, 20 and 30 years. If you had bought £1,000 of shares in Glaxo in 1965 your holding would have grown to be over £1.8m by 2004. Ian White, pharmaceutical analyst at Robert Fleming, says of Glaxo, 'It had the combination of good commercial management, vibrancy and the drive to succeed, and the right products. You often get two of the three, but rarely the whole package' (*Investor's Chronicle* 26 July 1996). The return on Glaxo shares relative to the *FTSE All-Share Index* is shown in Figure 6.2.

**FIGURE 6.2**  
**GSK total return performance**



Source: Datastream

Take another company, the UK-based industrial firm T & N. In 1982 investors realized that T & N would suffer as a result of asbestosis-related litigation. During August the market value of its shares fell to £37m as the shareholders realized that T & N would be forced to pay out vast sums to the victims of asbestosis. In November 1996 the company estimated that past and future compensation and other payments would amount to between £800m and £1.6bn.

From where [the *Investors Chronicle* asked] did a £37m basket case get £1.6bn? From its shareholders. Since 1986 T & N has issued around £700m of new equity via five rights issues, one placing and the 1987 takeover of AE . . . All this is to the good of the asbestosis sufferers, but it's a fair bet the shareholders who put it up aren't normally so generous with their donations to charity which is what in effect all T & N's capital raisings have been . . . The best course of action for T & N at any date in the 1980s would have been to hand the company over to the asbestos litigants lock, stock and barrel.

*Investor Chronicle*, 18 April 1997, p.10.

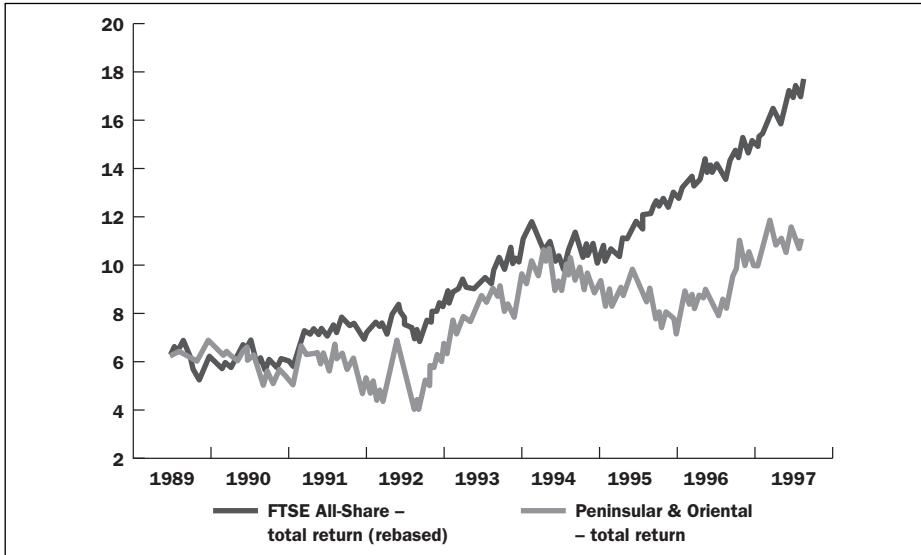
In 1998 what was left of T & N was taken over by the US company Federal Mogul.

Perhaps we can gain a glimpse of what shareholder value is by considering the mid-1990s crisis at the transport property conglomerate P&O. Lord Sterling, the chairman, was facing a shareholders' revolt and was battling to keep his job. As Figure 6.3 makes clear, P&O had under-performed the FTSE All-Share Index for ten years.

The management were judged to have destroyed shareholder value by putting resources into activities which 'have not produced enough return to cover the cost of using the money'. When they began to shake themselves up the change was noticeable to outside observers such as David Court, a fund manager at Scottish Amicable: 'When we met P&O in early 1996 it was regarded by its management as a national institution holding the flag for UK plc. When we met again six months later there were some interesting changes. Much to our surprise, management recognised that there were shareholders out there.' The company announced a target rate of return on capital of 15 percent for each of its operating divisions by 1998 and outlined plans to reduce its exposure to bulk shipping and sell off £500m worth of property and dispose of Bovis. Its container shipping business was merged with Nedlloyd to gain the necessary critical mass (112 container ships and a turnover of £4bn) in a highly competitive market and to gain cost savings estimated at between £120m and £400m. The English Channel ferry business was merged with Stena in 1998. These two shipping deals took P&O closer to making satisfactory returns. Many analysts were not convinced that these moves could save the company, mainly because of the unattractiveness of many of the industries in which it operates; for example, in the container shipping market, freight rates were falling because there were too many ships chasing too little work.

P&O formed a joint venture with a Chinese company for its bulk shipping unit. In 1999 Bovis Homes was given a stock market flotation and Bovis construction was sold to Australian owners in 1999. By 2000 P&O was achieving returns of nearly 15 percent, but the share price had not risen very much over the three years of managerial effort (total shareholder returns on shares had averaged 2.6 percent per year). The company pushed on with its search for shareholder value. This included investing in new capital items as well as disposals. For example, it ordered nine ships for delivery during 2000–4 at a total cost

**FIGURE 6.3**  
**P&O total return relative to the FTSE All-Share Index**



Source: Thompson Financial Datastream

of £2.3bn. The directors judged that more shareholder value could be achieved if the company split itself into two. In October 2000 it demerged the cruise business from the ports, ferries and logistics business – a radical move as most of the company’s value was in cruising. In 2002 it went even further, selling its 50 percent stake in the bulk shipping operations and sold its logistics business Trans European.

All these actions were designed to create value in each of its strategic business units. Sometimes it reduced costs by gaining sufficient scale through joint ventures, sometimes it sold an asset for more than what it was worth to P&O to a company that valued it more highly, sometimes it spent a tremendous amount of money buying new equipment to expand an operation.

## Why shareholder value?

It is clear that many commercial companies put shareholder value in second or third place behind other objectives. So why should we feel justified in holding up shareholder wealth maximization as the banner to follow? Isn’t growth in sales or market share more worthy? And what about the return to the labor force and to society generally?

What follows is a brief recap and extension of some of the comments made in Chapter 1 about the objectives of the firm in a competitive market environment that has responsibilities to shareholders.



There are several reasons why shareholder value is gaining momentum. One of these is the increasing threat of takeover by teams of managers searching for poorly managed businesses. Perhaps these individuals are at present running a competitor firm or are wide-ranging ‘corporate raiders’ ready to swoop on under-managed firms in any industry which, through radical strategic change, divestiture and shifting of executive incentives, can create more value for shareholders.

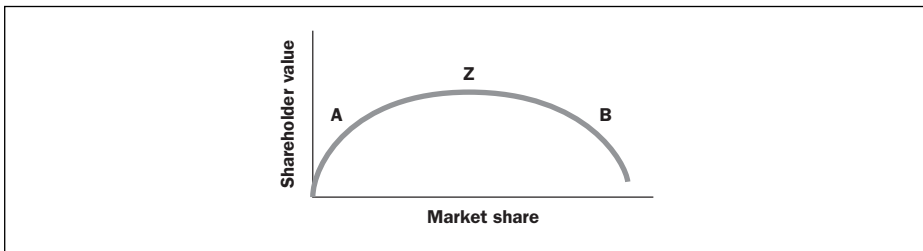
The owners of businesses have a right to demand that directors act in their best interests, and are increasingly using their powers to remove the stewards of their savings if they fail to do their utmost. To feel truly safe in their jobs managers should aim to create as much wealth as possible.

Arguably society as a whole will benefit if shareholder-owned firms concentrate on value creation. In this way scarce resources can be directed to their most valuable uses. Maximizing the productivity of resources enables high economic growth and higher standards of living.

### Confusing objectives

Some managers claim that there are measures of performance that are synonymous with, or good proxies for, shareholder wealth – such as customer satisfaction, market leadership or lowest-cost producer. These are then set as ‘strategic objectives’. In many cases achieving these goals does go hand in hand with shareholder returns but, as Figure 6.4 shows, the pursuit of these objectives can be taken too far. There is frequently a trade-off between shareholder value and these proxy goals. Taking market share as an example: it is apparent that for many firms increasing market share will bring greater economies of scale, create barriers to entry for potential competitors and help establish brand loyalty, among other benefits. This sort of situation is demonstrated by moving from A to Z in Figure 6.4. High market share is clearly an important factor in many industries but some firms seem to become trapped in an obsessive quest for market share.

**FIGURE 6.4**  
Market share as a strategic objective can be taken too far



The car industry is notorious for its very poor returns to shareholders combined with addiction to market share data. For example, the Detroit car makers averaged returns on capital of 3 percent per year in the 1990s (*The Economist*, 23 February 2002, p. 100). Perhaps some in the industry have taken matters too far and ended up at point B in Figure 6.4. Enormous investment in plant capacity, marketing and price promotions has created a situation where the risk-adjusted returns on the investment are lower than the optimum.

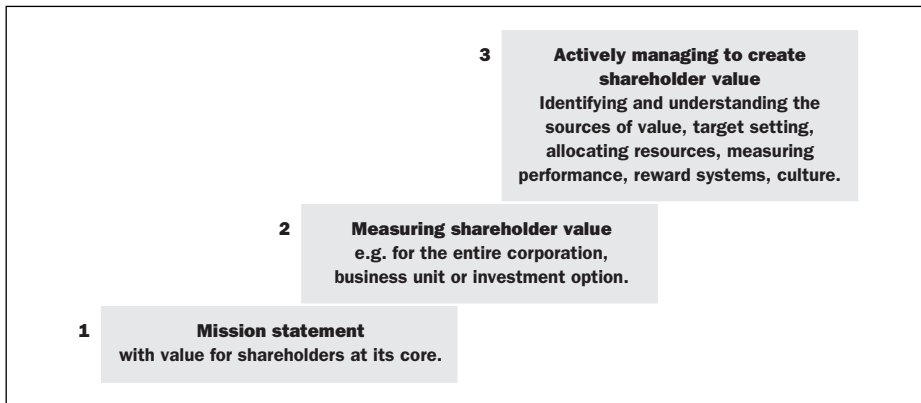
## Three steps to value

There are three steps to creating shareholder value. First, obtain awareness of, and a genuine commitment to, a shareholder-wealth-enhancing mission throughout the organization. Second, put in place techniques for measuring whether value is being created at various organizational levels. Make sure everyone understands and respects the measures adopted. Third, ensure that every aspect of management is suffused with the shareholder value objective, from human resource management to research and development.

**Ensure that every aspect of management is suffused with the shareholder value objective, from human resource management to research and development.**

**FIGURE 6.5**

### The three steps of value-based management



It is clearly important to have a management team that both understand and are fully committed to shareholder value. To implement true shareholder wealth maximization, managers need to know how to measure the wealth-creating potential of their actions. Before turning to appropriate methods of evaluating value creation we will examine some of the more popular and increasingly dated measurement techniques used to guide (or misguide) a business.

## Earnings-based management's failings

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The *Financial Times's* Lex column expressed a view on the traditional accounting-based performance measure of earnings (profits) per share, in the column on 7 May 1996.

How do you know a company is doing well? When earnings per share (eps) are growing rapidly, would be the standard reply. Eps is the main valuation yardstick used by investors; it has also become something of a fixation within companies. Rentokil, most famously among UK companies, has a target of boosting eps by at least 20 per cent a year. One of the reasons it gobbled up rival services group, BET, was to keep that growth rate going a few more years. But eps is not a holy grail in determining how well a company is performing. This is not merely because management still have latitude in deciding what earnings to report; it is because eps growth says little about whether a company is investing shrewdly and managing its assets effectively. It may, for example, be possible to boost eps by stepping up the rate of investment. But unless the return on investment exceeds the cost of capital, a company will be destroying value.

There are many reasons why earnings can mislead in the measurement of value creation, some of which are:

- accounting is subject to distortions and manipulations;
- the investment made is often inadequately represented;
- the time value of money is excluded from the calculation;
- risk is not considered.

### The trouble with accounting numbers

When drawing up profit and loss accounts and balance sheets accountants have to make judgments and choose a basis for their calculations. They try to match costs and revenues. Unfortunately for the users of the resulting 'bottom line' figures, there can be many alternative approaches, which give completely different results and yet all follow accounting body guidelines.

Take the example of the identical companies X and Y. These have just started up and in the first three years, annual profits of £3m before deducting depreciation are expected. Both companies invested their entire initial capital of £10m in plant and machinery. The accountant at X takes the view that the machinery has a useful life of ten years and that a 25 percent declining balance depreciation is appropriate. The accountant at Y, after reviewing the information on the plant and machinery, is more pessimistic and judges that a seven-year life with straight-line depreciation more truly reflects the future reality. The first three years' profits are shown in Table 6.1.

The underlying economic position is the same for both company X and company Y, but in the first two years, company X appears to be less profitable.

Outside observers and management comparing the two companies may gain a distorted view of quality of stewardship and the potential of the firm. Investment decisions and incentive schemes based on profit figures can lead to sub-optimal decisions and behavior. They may also lead to deliberate manipulation. There are several arbitrary accounting allocations that make comparisons and decisions difficult. These concern, for example, goodwill and provisions, extraordinary and exceptional items and the treatment of research and development expenditure.

**TABLE 6.1**  
**Companies X and Y: Profits for the first three years**

	Year (£000s)		
	1	2	3
<b>Company X</b>			
Pre-depreciation profit	3,000	3,000	3,000
Depreciation	<u>2,500</u>	<u>1,875</u>	<u>1,406</u>
Earnings	500	1,125	1,594
<b>Company Y</b>			
Pre-depreciation profit	3,000	3,000	3,000
Depreciation	<u>1,429</u>	<u>1,429</u>	<u>1,429</u>
Earnings	1,571	1,571	1,571

### Ignoring the investment money sacrificed

Examining earnings per share growth as an indicator of success fails to take account of the investment needed to generate that growth. Take the case of companies A and B (*see* Table 6.2), both of which have growth in earnings of 10 percent per year and are therefore equally attractive to an earnings-based analyst or manager.

**TABLE 6.2**  
**Companies A and B: Earnings**

	Year (£000s)		
	1	2	3
Earnings of A	1,000	1,100	1,210
Earnings of B	1,000	1,100	1,210

To a value-oriented analyst A is much more interesting than B if we allow for the possibility that less additional investment is needed for A to create this improving profits pattern. For example, both firms need to offer credit terms to their customers: however B has to offer much more generous terms than A to gain sales; so it has to invest cash in supporting higher debtor balances. B is also less efficient in its production process and has to invest larger amounts in inventory for every unit increase in sales.

When B’s accounts are drawn up the additional debtors and inventory are included as an asset in the balance sheet and do not appear as a cost element in the profit and loss account. This results in the costs shown in the profit and loss account understating the cash outflow during a period.

If we examine the cash flow associated with A and B (*see* Table 6.3) we can see immediately that A is generating more shareholder value (assuming the pattern continues and all other factors are the same).

Table 6.3 illustrates the conversion from earnings to cash flow figures.

**TABLE 6.3**  
**Companies A and B: Earnings and cash flow**

Year	Company A			Company B		
	£000s			£000s		
	1	2	3	1	2	3
Profit (earnings)	1,000	1,100	1,210	1,000	1,100	1,210
Increase in debtors	0	20	42	0	60	126
Increase in inventory	0	30	63	0	50	105
Cash flow before tax	1,000	1,050	1,105	1,000	990	979
Percentage change		+5%	+5.2%		-1%	-1.1%

If B also has to invest larger amounts in vehicles, plant, machinery and property for each unit increase in sales and profit than A the difference in the relative quality of the earnings growth will be even more marked.

**Time value**

It is possible for growth in earnings to destroy value if the rate of return earned on the additional investment is less than the required rate. Take the case of a team of managers trying to decide whether to make a dividend payment of £10m. If they retained the money within the business both earnings and cash flow would rise by £1,113,288 for each of the next ten years. Managers motivated by earnings growth might be tempted to omit the dividend payment. Future earnings would rise and therefore the share price would also rise on the announcement that the dividend would not be paid. Right? Wrong! Investors in this firm are likely to have a higher annual required rate of return on their £10m than the 2 percent offered by this plan. The share price will fall and shareholder

value will be destroyed. What the managers forgot was that money has a time value and investors value shares on the basis of *discounted* future cash flows.

It seems so obvious that a 2 percent rate of return on invested money is serving shareholders badly. Yet how many companies do you know holding tens or hundreds of millions of cash rather than giving back to shareholders to invest elsewhere? Sure, it gives managers a greater sense of security to have all that cash around – how can the company be liquidated and they lose their jobs? – but shareholders would rather this money was used more effectively. Any money that cannot be used to generate good returns should be handed back to them. If earnings per share are rising what have the shareholders got to complain about? retort the managers. The thundering reply is: it is easy to increase earnings per share just by holding onto ever-larger quantities of money; what shareholders want is a return greater than the opportunity cost of capital (the time value of money) – the return available elsewhere for the same level of risk.

A variation on the theme of growing eps by investing large sums is to acquire other companies. In the case of Vodafone (Exhibit 6.2) shareholders are worried that managers are incentivized to increase eps with insufficient attention paid to the amount of investment required by shareholders to boost these accounting numbers.

## Gent's latest package raises acquisition fear

By Robert Budden, Telecommunications correspondent

Analysts and investors in Vodafone have started questioning some of the performance targets behind Sir Christopher Gent's latest bonus package.

They argue that the new targets could over-encourage the chief executive to pursue more acquisitions.

Attention is focusing on Sir Christopher's new 9m share options package, where the award of options is linked to earnings per share targets. To receive his total entitlement to the estimated 9m options, Sir Christopher must deliver challenging group eps growth of 15 per cent a year over and above retail price inflation.

Analysts said this top hurdle was tough, but warned it could encourage Sir Christopher to embark on more acquisitions to hit the eps targets.

'These targets include acquired eps,' said one analyst, 'so an easy way to grow eps would be to acquire companies on a lower multiple.'

Vodafone confirmed that if it were to take over companies trading on lower price earnings multiples this could boost its earnings per share figure and so trigger higher payouts. But this could jeopardise its other performance based targets linked to the factors such as share price performance or growth in average revenues per user.

'We would be wary of further acquisitions,' said one large shareholder.

'An acquisition strategy that fits in terms of extending their global footprint would have to be proved to be rapidly enhancing to shareholder value.'

Some analysts are also believed to be unhappy that Sir Christopher's share options are tied to eps 'before goodwill amortisation and exceptional items', because they fear this protects him against any future write-downs against acquisitions.

### EXHIBIT 6.2 Gent's latest package raises acquisition fear

Source: *Financial Times* 24 June 2002

## Ignoring risk

Focussing purely on the growth in earnings fails to take account of another aspect of the quality of earnings: risk. Increased profits that are also subject to higher levels of risk require a higher discount rate. Imagine a firm is contemplating two alternative growth options with the same expected earnings, of £100,000 per year to infinity. Each strategy is subject to risk but S has a wider dispersion of possible outcomes than T (*see* Table 6.4).

Investors are likely to value strategy T more highly than strategy S. Examining crude profit figures, either historic or projected, often means a failure to adequately allow for risk. In a value-based approach it is possible to raise the discount rate in circumstances of greater uncertainty – more on this in Chapter 10.

**TABLE 6.4**  
**Probabilities of annual returns on strategies S and T**

	Strategy S		Strategy T	
	Outcome earnings (profits) £	Probability	Outcome earnings (profits) £	Probability
	-100,000	0.10	80,000	0.10
	0	0.20	90,000	0.15
	100,000	0.40	100,000	0.50
	200,000	0.20	110,000	0.15
	300,000	0.10	120,000	0.10
<i>Expected outcome</i>	<b>£100,000</b>		<b>£100,000</b>	

### Worked example 6.1 EARNINGS GROWTH AND VALUE

Earnings and earnings per share growth can lead to higher shareholder value in some circumstances. In others it can lead to value destruction. Shareholder value will rise if the return obtainable on new investment is at least as great as the required rate of return for the risk class. Consider EPSOS plc, financed entirely with equity capital and with a required rate of return of 15%. To make the example simple we assume that EPSOS does not need to invest in higher levels of working capital if sales expand. EPSOS pays shareholders its entire earnings after tax every year and is expected to continue doing this indefinitely. Earnings and cash flow amount to £100m per year. (The amount charged as depreciation is just sufficient to pay for investment to maintain sales and profits.) The value of the company given the opportunity cost of shareholders' money of 15% is  $£100\text{m}/0.15 = £666.67\text{m}$ .

	<i>£m</i>
Sales	300.00
Operating expenses	<u>157.14</u>
Pre-tax profit	142.86
Taxes @ 30%	<u>42.86</u>
Profits and cash flow after tax	<u>100.00</u>

Now imagine that EPSOS takes the decision to omit this year's dividend. Shareholders are made poorer by £100m now. However, as a result of the additional investment in its operations for the next year and every subsequent year sales, earnings, eps and cash flows after tax will rise by 20%. This is shown below.

	<i>£m</i>
Sales	360.00
Operating expenses	<u>188.57</u>
Pre-tax profit	171.43
Taxes @ 30%	<u>51.43</u>
Profits and cash flow after tax	<u>120.00</u>

Earnings have grown by an impressive 20%. Also value has been created. The extra £20m cash flow per annum stretching into the future is worth  $\frac{£20m}{0.15} = £133.33m$ . This is achieved with a £100m sacrifice now. Here a growth in earnings has coincided with an increase in value. £33.33m of value is created.

Now consider a scenario in which sales growth of 20% is achieved by using the £100m to expand the business, but this time the managers, in going for sales growth, push up operating expenses by 32%. Earnings and cash flow increase by a respectable 6.81%, but, crucially, value falls.

	<i>£m</i>
Sales	360.00
Operating expenses $157.14 \times 1.32$	<u>207.42</u>
Pre-tax profit	152.58
Taxes @ 30%	<u>45.77</u>
Profits and cash flow after tax	<b>106.81</b>

The incremental perpetual cash flow is worth a present value of  $\frac{£6.81m}{0.15} = £45.4m$ . But the 'cost' of achieving this is the sacrifice of £100m of income now. Overall shareholder value has been destroyed despite earnings and eps growth. It is surprising how often senior managers make this basic error.



For an example of a real company growing earnings (profits carefully defined as before the deduction of interest, tax, depreciation and amortization) but producing poor returns on invested capital we again turn to Vodafone – see Exhibit 6.3. Perhaps we should not focus exclusively on income over a few recent years. Perhaps this near term sacrifice is worth it. Perhaps net cash flows will rocket once the basic infrastructure is in place. Perhaps.

## A wake-up call for bean counters

John Plender Lombard

There was something faintly surreal about the accounts of telecom companies in the 1990s bubble, with their multiple definitions of profit and their customary invitation to ignore the bottom line loss. Now that the bubble has burst there is still a hint of surrealism about, as I found when thumbing through Vodafone's figures last week.

Vodafone is now the 13th largest company in the world measured by stock market capitalisation. The obvious pertinent question is whether, when Vodafone's managers talk of 'enlarging our footprint', they are employing a euphemism for size for size's sake or whether they are creating real value.

The preliminary announcement contains a welter of figures, including a loss for the year of £9.8bn. ('Once again we have delivered excellent results,' says Lord MacLaurin, the chairman.) Then you have operating profit before goodwill amortisation and exceptional items; adjusted earnings per share; earnings before interest; tax, depreciation and amortisation (ebitda); and free cash flow.

These numbers are more flattering. Understandably enough, they are also the ones on which Sir Christopher Gent, Vodafone's outgoing chief executive, chooses to dwell.

I emphasise that this is no criticism of Sir Christopher or Vodafone, which observes the normal reporting conventions, but of the conventions themselves. Despite the shareholder value movement, traditional disclosure is hopelessly deficient in explaining the efficiency with which companies deploy capital.

Ebitda, earnings per share, free cash flow and the rest mean nothing without adequate information on the capital used to generate them. Yet nobody has had the wit to ask the quoted companies to report routinely their weighted average cost of capital along with some sensible measure of return on capital.

For that you have to turn to a securities analyst like Mustapha Omar at brokers Collins Stewart. His figures will tell you that Vodafone's cash flow return on investment stopped covering its cost of capital in 2000. Given the wholesale destruction of value since then, he worries that Arun Sarin, the incoming chief executive, is already talking about those damned footprints again ... Forcing companies, analysts and investors to focus on whether a surplus is being earned over the cost of capital could do wonders for value creation.

### EXHIBIT 6.3 Big feet, shrinking values

Source: *Financial Times* 13/14 September 2003

## Return on capital employed (ROCE) has failings

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It is becoming clear that simply examining profit figures is not enough for good decision-making and performance evaluation. Obviously the amount of capital invested has to be considered alongside the income earned. This was recognized long before the development of value-based management, as signified by the widespread use of a ratio of profits to assets employed. There are many variations on this theme: return on capital employed (ROCE), return on investment (ROI), return on equity (ROE) and accounting rate of return (ARR), but they all have the same root. They provide a measure of return as a percentage of resources devoted. The major problem with using these metrics of performance is that they are still based on accounting data. The profit figure calculations are difficult enough, but when they are combined with balance sheet asset figures we have a recipe for unacceptable distortion. The *Financial Times* puts it this way in its Lex column of 7 May 1996:

Unfortunately, the crude figures for return on capital employed – operating profit/capital employed – that can be derived from a company's accounts are virtually useless. Here the biggest problem is not so much the reported operating profit as the figures for capital employed contained in the balance sheet. Not only are assets typically booked at historic cost, meaning they can be grossly undervalued if inflation has been high since they were acquired; the capital employed is also often deflated by goodwill write-offs. Once balance sheets have been shrunk, pedestrian profits translate into fabulous returns.

Added to the list of problems is the issue of capitalization. That is the extent to which an item of expenditure is written off against profits as an expense or taken on to the balance sheet and capitalized as an asset. For example, firms differ in their treatment of R&D; companies that spend significant sums on R&D and then have a policy of writing it off immediately are likely to have lower asset value than those which do not write it off against profits in the year of expenditure. Cross-company comparisons of profits/assets can therefore be very misleading.

Focussing on accounting rates of return can lead to short-termism. Managers who are judged on this basis may be reluctant to invest in new equipment as this will raise the denominator in the ratio, producing a poor ARR in the short term. This can destroy value in the long term. Fast-growing companies needing extensive investment in the short term with the expectation of reaping rich rewards in the long term should not be compared with slow-growth and low-investing firms on the basis of ARR despite the current low ARR, they are more likely to outperform in terms of value in the long term.

## Focussing on earnings is not the same as value

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One of the most pervasive myths of our time is: ‘**But our shareholders do focus on eps and ARR, don’t they?**’ – and it is easy to see why. Senior executives when talking with institutional shareholders and analysts often find the conversation reverting to a discussion of short-term earnings forecasts. If a merger is announced directors feel the need to point out in press releases that the result will not be ‘earnings dilutive’ in the forthcoming year.

This surface noise is deceiving. Intelligent shareholders and analysts are primarily interested in the long-term cash flow returns on shares. The earnings attributable to the next couple of years are usually an insignificant part of the value of a share. Over two-thirds of the value of a typical share is determined by income to be received five or more years hence (see Chapter 13 for these calculations). Knowledge of this or next year’s earnings is not particularly interesting in itself. It is sought because it sheds light on the medium- and long-term cash flows.

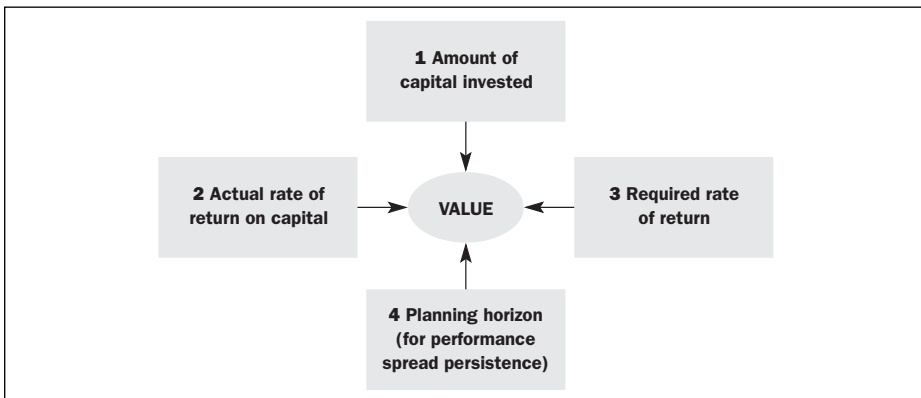
There are hundreds of quoted companies that do not expect to produce any positive earnings at all in the next two to five years and yet often these shares are among the most highly valued in the market. There are dozens of biotechnology companies that have tapped shareholders for funds through rights issues and the like for years. Some have become massive concerns and yet have never made a profit or paid a dividend. The same applies to internet companies, and, in the past it was true of satellite television operators (for example BSkyB) which have now reached the phase of high cash generation. Exhibit 6.4 describes what investors are looking for.

## How a business creates value

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Value is created when investment produces a rate of return greater than that required for the risk class of the investment. Shareholder value is driven by the four factors shown in Figure 6.6.

**FIGURE 6.6**  
The four key elements of value creation



## Investment community piles on pressure for better returns

**Companies need increasingly to develop medium-term corporate strategies which will enable them meet the rising expectations of those who provide their equity capital**

Nigel Page

Tapping into the booming liquidity of global capital markets is the corporate ideal – but the gatekeepers of that liquidity, the global investor and analyst communities, are basing their investment strategies on increasingly focused information. In this environment, the historical reporting model is living on borrowed time – investors, who typically base share price valuations on their forecasts of future cash flows, demand forward-looking information to feed into their valuation models.

Management is increasingly sensitive to the stark fact that the use of equity capital is not ‘free’ – it has been invested in the hope of earning a return. It is this required return . . . that defines the company’s cost of equity capital. Management can only create value for shareholders if the company consistently generates a return on capital greater than its cost of capital . . .

For companies, the challenge must be to use this escalating value focus in their strategic planning, and in measuring performance. Once the internal

systems are in place, the priority is to establish effective communication into the marketplace. . . .

‘Historical cost accounting measures are becoming less relevant, with more companies using value-based information and non-financial indicators to judge performance internally. Greater disclosure in these areas will allow investors to make more informed decisions on the potential future of companies.’

The international investment community is well aware of the limitations of annual reports, which provide emphasis on accounting profit – itself no real indicator of the creation of economic value . . .

Analysts and institutional investors focus much of their research on company strategy and the ‘value platforms’ underlying that strategy and recent surveys of investors’ demand for, and use of, information confirm their desire for more forward-looking information, as well as the importance of drivers of future performance to their investment decisions.

### EXHIBIT 6.4 Investment community piles on pressure for better returns

Source: *Financial Times*, 10 December 1999, FT Director (special section), p. VIII

The difference between the second and third elements in Figure 6.6 creates the *performance spread*. The performance spread is measured as a percentage spread above or below the required rate of return, given the finance provider’s opportunity cost of capital. Value is destroyed if 3 is greater than 2, and is created when 2 is greater than 3.

The absolute amount of value generated is determined by the quantity of capital invested multiplied by the performance spread. So, for example, if Black plc has a required rate of return of 14 percent per annum and actually produces 17 percent on an investment base of £1,000,000 it will create £30,000 of value per year:

$$\begin{aligned}
 \text{Annual value creation} &= \text{Investment} \times (\text{actual return} - \text{required return}) \\
 &= I(r - k) \\
 &= \pounds 1,000,000 \times (0.17 - 0.14) = \pounds 30,000
 \end{aligned}$$

The fourth element in Figure 6.6 needs more explanation. It would be unreasonable to assume that positive or negative return spreads will be maintained forever. If return spreads are negative, presumably managers will (eventually) take the necessary action to prevent continued losses. If they fail to respond then shareholders will take the required steps through, say, sackings or the acceptance of a merger offer. Positive spreads arise as a result of a combination of the attractiveness of the industry and the competitive strength of a firm within that industry (see Chapter 7). High returns can be earned because of market imperfections. For example, a firm may be able to prevent competitors

**The higher the initial performance spread the more attractive market entry seems to potential competitors.**

entering its market segment because of economies of scale, brand strength or legal exclusion through patents. However most firms will sooner or later experience increased competition and reduced margins. The higher the initial performance spread the more attractive market entry seems to potential

competitors (or substitute product developers). Examples of industries that were at one time extremely profitable and which were penetrated to the point where they have become highly competitive include personal computers and silicon chip manufacture.

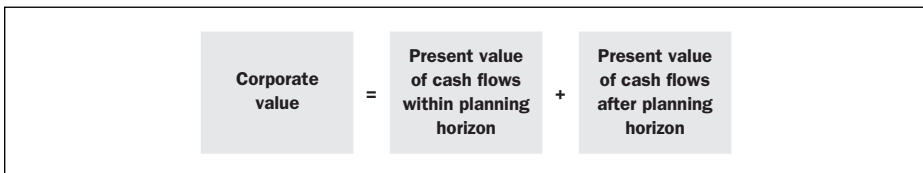
In shareholder value analysis it is usually assumed that returns will, over time, be driven towards the required rate of return. At some point in the future (the planning horizon) any new investment will, on average, earn only the minimum

**Any new investment will, on average, earn only the minimum acceptable rate of return.**

acceptable rate of return. Having said this, we do acknowledge that there are some remarkable businesses that seem to be able to maintain positive performance spreads for decades. Their economic franchises are protected by powerful barriers preventing serious competitive attack, e.g. Coca-Cola and

Gillette. Warren Buffett calls such companies ‘inevitables’ because there is every reason to believe they will be dominating their industries decades from now – see Arnold (2002). If we leave inevitables to one side, we see that for the majority of businesses their value consists of two components, as shown in Figure 6.7.

**FIGURE 6.7**  
**Corporate value**



In the second period (after the planning horizon), even if investment levels are doubled, corporate value will remain constant, as the discounted cash inflows associated with that investment exactly equal the discounted cash outflows.

If it is assumed that Black plc can maintain its 3 percent return spread for ten years and pays out all income as dividends then its future cash flows will look like this:

Years:	<u>1 → 10</u>	11 → infinity
Cash flow:	£170,000	£140,000

The value of the firm is the discounted value of these cash flows.

The discounted cash flow within the planning horizon is:

$$\begin{aligned} \text{£170,000} \times \text{annuity factor (10 years, 14\%)} &= \text{£170,000} \times 5.2161 \\ &= \text{£886,737} \end{aligned}$$

*plus* the discounted cash flow after the planning horizon:

£140,000/0.14 = £1,000,000. This is then discounted back 10 years:

$$\frac{1,000,000}{(1 + 0.14)^{10}} = \text{£269,744}$$

<i>Less</i> initial investment	(£1,000,000)
Value created	<b>£156,481</b>

The value of the firm = Capital (£1,000,000) + Value created (£156,481)  
= **£1,156,481**

An alternative approach: The value of the firm is equal to the initial investment in the firm (£1,000,000) plus the present value of all the values created annually.

Investment	+	Value created within planning horizon	+	Value created after planning horizon	
£1,000,000	+	£30,000 × 5.2161 £30,000 × Annuity factor (10 years, 14%)	+	£1,000,000 (0.14 – 0.14)	
£1,000,000	+	£156,481	+	0	= <b>£1,156,481</b>

## The five actions for creating value

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Good growth occurs when a business unit or an entire corporation obtains a positive spread. Bad growth, the bane of shareholders, occurs when managers invest in strategies that produce negative return spreads. This can so easily happen if the focus of attention is on sales and earnings growth. To managers encouraged to believe that their job is to expand the business and improve the

bottom line, acceptance of the notion of bad growth in profits is a problem. But, as we have seen, it is perfectly possible to show growing profits on a larger investment base producing an incremental return less than the incremental cost of capital.

Figure 6.8 shows the options open to managers. This model can be applied at the corporate, business unit or product line level.

**FIGURE 6.8**  
**To expand or not to expand?**

	<b>Grow</b>	<b>Shrink</b>
<b>Positive performance spread</b>	<b>Value creation</b>	<b>Value opportunity forgone</b>
<b>Negative performance spread</b>	<b>Value destruction</b>	<b>Value creation</b>

It has already been demonstrated that overall Black plc produces a more than satisfactory return on investment. Now assume that the firm consists of two divisions: a clothing factory and a toy import business. Each business is making use of £500,000 of assets (at market value). The clothing division is expected to produce an 11 percent return per annum over the next ten years whereas the toy division will produce a 23 percent per annum return over the same period. After the ten-year planning horizon both divisions will produce returns equal to their risk-adjusted required return: for the clothing division this is 13 percent and for the more risky toy division this is 15 percent.

The cash flows are:

Year	1 → 10	11 → infinity
Clothing	£55,000	£65,000
Toys	£115,000	£75,000

The annual value creation within the planning horizon is:

$$I \times (r - k)$$

Clothing	$£500,000 \times (0.11 - 0.13) = -£10,000$
Toys	$£500,000 \times (0.23 - 0.15) = +£40,000$

Despite the higher return required in the toy division, it creates value (calculating required rates of return is covered in Chapter 10). For the next ten years a 15 percent return is achieved plus a shareholder bonus of £40,000. This division could fit into the top left box of Figure 6.8. The management team may want to consider further investment in this unit so long as the marginal investment can generate a return greater than 15 percent. To pass up positive return spread

investments would be to sacrifice valuable opportunities and enter the top right box of Figure 6.8.

The clothing operation does not produce returns sufficient to justify its present level of investment. Growth in this unit would only be recommended if such a strategy would enable the division to somehow transform itself so as to achieve a positive spread. If this seems unlikely then the best option is probably retrenchment, a scaling down or withdrawal from the market. This will release resources to be more productively employed elsewhere, either within or outside of the firm. Such shrinkage would create value by reducing the drag this activity has on the rest of the firm.

This line of thought can assist managers at all levels to allocate resources. At the corporate level knowledge of potential good growth and bad growth investments will help the selection of a portfolio of businesses. At the business unit level, product and customer groups can be analyzed to assess the potential for value contribution. Lower down, particular products and customers can be ranked in terms of value. A simplified example of corporate level value analysis is shown in Figure 6.9.

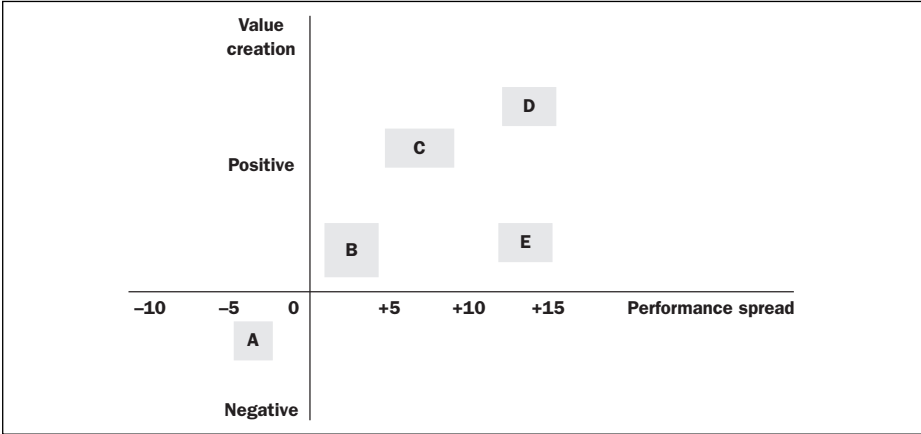
In Figure 6.9, strategic business unit A ( $SBU_A$ ) is a value destroyer due to its negative return spread. Perhaps there is over-investment here and shareholders would be better served if resources were transferred to other operations.  $SBU_B$  produces a small positive spread and decisions on its future will depend on the expected longevity of its contribution.  $SBU_C$  produces a lower return spread than  $SBU_E$ , but manages to create more value because of its higher future investment levels. Some businesses have greater potential than others for growth while maintaining a positive spread. For example,  $SBU_E$  might be a niche market player in fine china where greatly expanded activity would reduce the premium paid by customers for the exclusivity of the product – quickly producing negative spread on the marginal production. Strategic business unit C might be in mid-priced tableware competing on design where investment in the design and marketing teams might produce positive spread growth. Strategic business unit D is capable of high spreads and high investment producing the largest overall gain in value. The anti-ulcer drug, Zantac, when still under patent, produced large spreads and was sold in high volumes around the world, producing billions of pounds of value for GlaxoSmithKline.

The five actions available for increasing value are shown in the value action pentagon (Figure 6.10). The five actions in the value action pentagon could be applied to Black plc.



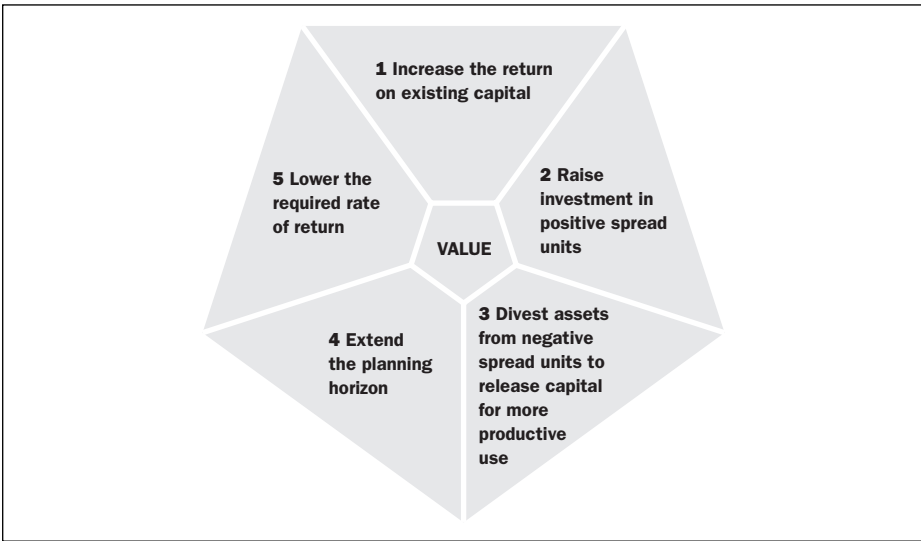
**FIGURE 6.9**

**Value creation and strategic business unit (SBU) performance spreads**



**FIGURE 6.10**

**The value action pentagon**



**Increasing the return on existing capital**

The value of Black of £1,000,000 + £156,481 could be increased if the management implemented a plan to improve the efficiency of their existing operations. If the rate of return on investment for the firm as a whole over the next ten years is raised to 18 percent then the firm’s value rises to £1,208,644, viz:

Annual value creation	= $I \times (r - k)$	
	= $\pounds 1,000,000 \times (0.18 - 0.14)$	
	= $\pounds 40,000$	
Present value over ten years	= $\pounds 40,000 \times \text{Annuity factor (10 years, 14\%)}$	
	= $\pounds 40,000 \times 5.2161 =$	$\pounds 208,644$
plus initial investment		<u><math>\pounds 1,000,000</math></u>
Corporate value		<b><u><math>\pounds 1,208,644</math></u></b>

An increase of  $\pounds 52,163$  ( $\pounds 1,208,644 - \pounds 1,156,481$ ) in value is available for every 1 percent improvement in return spread.

### Raise investment in positive spread units

If Black could obtain a further  $\pounds 500,000$  from investors with a required rate of return of 15 percent to invest in the toy division to produce a 23 percent return the value of the firm would rise to  $\pounds 1,847,242$  ( $\pounds 500,000$  being the new capital invested).

Annual value creation on clothing	=	$-\pounds 10,000$
Annual value creation on toys = $\pounds 40,000 \times 2$	=	<u><math>\pounds 80,000</math></u>
		<u><math>\pounds 70,000</math></u>
Over ten years		
Clothing: $-\pounds 10,000 \times \text{Annuity factor (10 years, 13\%)}$		
Toys: $\pounds 80,000 \times \text{Annuity factor (10 years, 15\%)}$		
Clothing: $-\pounds 10,000 \times 5.4262$	=	$-\pounds 54,262$
Toys: $\pounds 80,000 \times 5.0188$	=	<u><math>\pounds 401,504</math></u>
		<u><math>\pounds 347,242</math></u>
plus the initial investment		<u><math>\pounds 1,500,000</math></u>
Corporate value		<b><u><math>\pounds 1,847,242</math></u></b>

### Divest assets

If Black could close its clothing division, release  $\pounds 500,000$  to expand the toy division and achieve returns of 23 percent on the transferred investment then value increases dramatically:

Annual value creation	= $I \times (r - k)$	
	= $\pounds 1,000,000 \times (0.23 - 0.15)$	
	= $\pounds 80,000$	
Present value over ten years	= $\pounds 80,000 \times \text{Annuity factor (10 years, 15\%)}$	
	= $\pounds 80,000 \times 5.0188 =$	$\pounds 401,504$
plus initial investment		<u><math>\pounds 1,000,000</math></u>
Corporate value		<b><u><math>\pounds 1,401,504</math></u></b>

### Extend the planning horizon

Sometimes steps can be taken to exploit a competitive advantage over a longer period than originally expected. For example, perhaps the toy division could negotiate a long-term exclusive import license with the supplier of an established premium-priced product, thus closing the door on the entry of competitors. If we suppose that the toy division will now produce a return spread of 23 percent for a 15-year period rather than 10 years the value of the company rises to £1,179,634, viz:

Annual value creation on clothing	=	-£10,000	
Annual value creation on toys	=	£40,000	
Present value over 10 years (clothing)			
=	-£10,000 × Annuity factor (10 years, 13%)		
		= -£10,000 × 5.4262	
		= -£54,262	
Present value over 15 years (toys)	=	£40,000 × Annuity factor (15 years, 15%)	
	=	£40,000 × 5.8474 = £233,896	
Total value creation	=	£233,896 - £54,262 =	£179,634
<i>plus</i> initial investment			<u>£1,000,000</u>
Corporate value			<b><u>£1,179,634</u></b>

### Lower the required rate of return

It may be possible to lower the required rate of return by adjusting the proportion of debt to equity in the capital structure or by reducing business risk. (Capital structure is examined in more detail in Chapters 10 and 18.) Suppose that Black can lower its required rate of return by shifting to a higher proportion of debt, so that the overall rate falls to 12 percent. Then the value of the firm rises to £1,282,510.

Annual value creation	=	$I \times (r - k)$	
	=	1,000,000 × (0.17 - 0.12)	
	=	£50,000	
Present value over ten years	=	£50,000 × Annuity factor (10 years, 12%)	
Total value creation	=	£50,000 × 5.6502 =	£282,510
<i>plus</i> initial investment			<u>£1,000,000</u>
Corporate value			<b><u>£1,282,510</u></b>

(Many companies tend to borrow little. They finance their businesses almost entirely through equity (shareholders') money. The motivation is often to reduce the risk of financial distress. This may be due to a desire to serve the interests of shareholders, but more often it is because managers want to avoid financial distress for their own safety. They can become too cautious and forgo the opportunity of reducing the overall cost of capital (discount rate) by not using a higher proportion of cheaper debt finance.)

## Conclusion

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The switch from management by accounting numbers to management using financial concepts such as value, the time value of money and opportunity cost is only just beginning. Some highly successful firms are leading the way in insisting that each department, business unit and project add value to shareholders' investment. This has required a re-examination of virtually all aspects of management, ranging from performance measurement systems and strategic planning to motivational schemes and training programs. The rest of this section of the book builds on the basic principles behind value-based management discussed in this chapter.



# VALUE THROUGH STRATEGY

Introduction

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Value principles touch every corner of the business

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The firm's objective

---

Strategic business unit management

---

Strategic assessment

---

Strategic choice

---

Strategy implementation

---

What use is the head office?

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Targets and motivation

---

Conclusion

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## Introduction

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Transforming a corporation from one that is earnings based to one which is focussed on value has profound effects on almost all aspects of organizational life. New light is cast on the most appropriate portfolio of businesses making up the firm, and on the strategic thrust of individual business units. Acquisition and divestment strategies may be modified to put shareholder wealth creation center stage. Capital structure (proportion of debt relative to equity capital) and dividend payout policy are predicated on the optimal approach from the shareholders' point of view, not by 'safety first' or earnings growth considerations. Performance measures, target setting and managerial compensation become linked to the extent that wealth is created rather than the vagaries of accounting numbers.

To unite the organization in pursuit of wealth creation an enormous educational and motivational challenge has to be met. A change in culture is often required to ensure that at all levels, the goal is to create value. Retraining and new reward systems are needed to help lift eyes from the short-term to long-term achievements.

This chapter gives a taste of the pervading nature of value-based managerial thinking. Later chapters consider some specific aspects of value-based management such as the employment of metrics to gauge the extent of achievement in value terms, the way to calculate the opportunity cost of capital and the value to be destroyed or gained through mergers.

## Value principles touch every corner of the business

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Figure 7.1 summarizes some of the most important areas where value-based management impacts on the firm. To describe them all fully would require a book as long as this one, so only the most important points are discussed below.

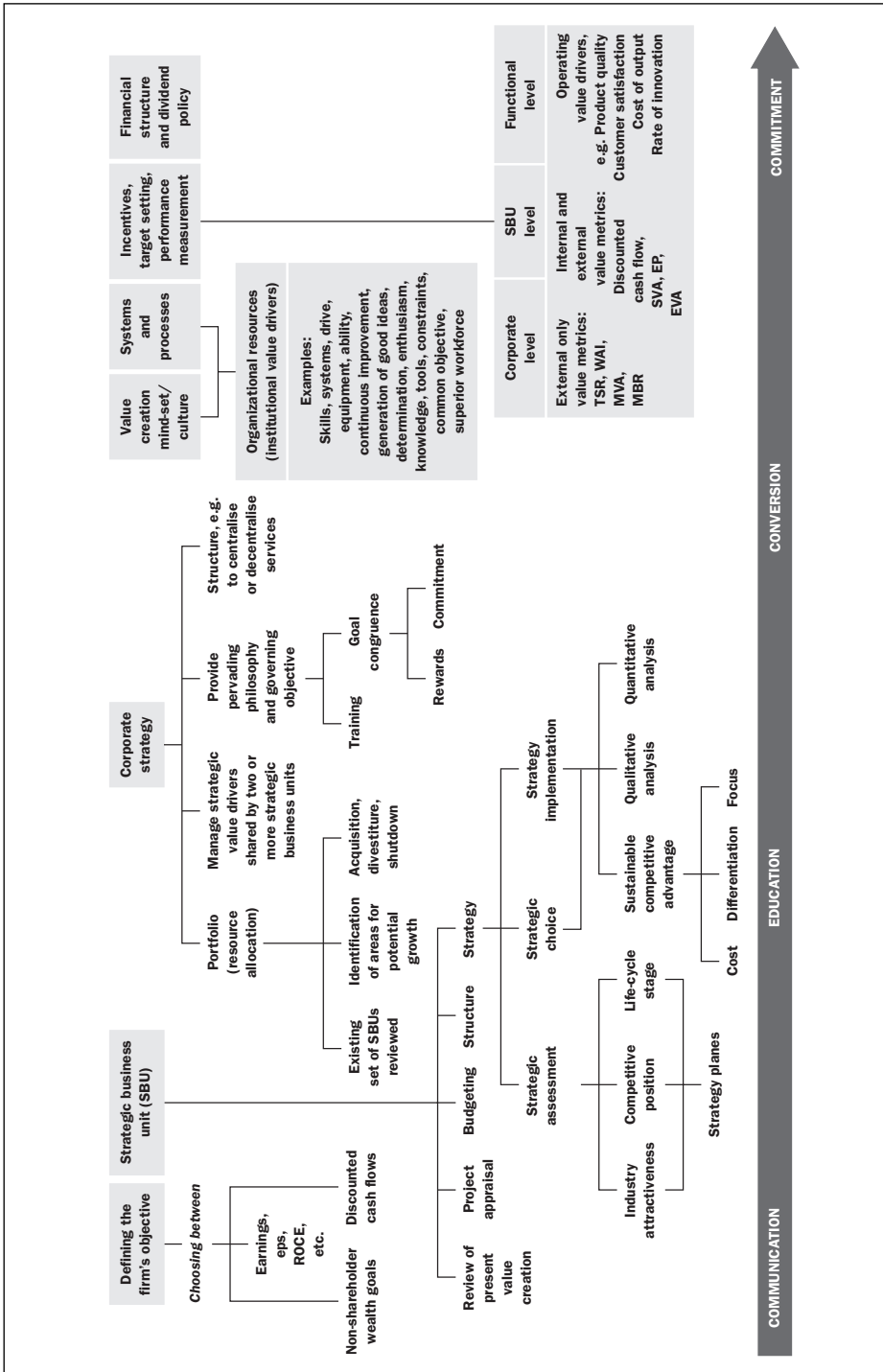
## The firm's objective

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The firm has first to decide what it is that is to be maximized and what will merely be satisfied. In value management the maximization of sales, market share, employee satisfaction, customer service excellence, and so on, are rejected as the objective of the firm. All of these are important and there are levels of achievement for each which are desirable in so far as they help to maximizing shareholder wealth, but they are not *the* objective. It is important that there is clarity over the purpose of the firm and crystal-clear guiding principles for managers making strategic and operational decisions. Objectives stated in terms of a vague balance of interests are not appropriate for a commercial organization in a competitive environment. The goal of maximizing discounted cash flows to shareholders brings simplicity and direction to decision-making.

FIGURE 7.1

Value principles influence most aspects of management





## Strategic business unit management

A strategic business unit (SBU) is a business unit within the overall corporate entity which is distinguishable from other business units because it serves a defined external market in which management can conduct strategic planning in relation to products and markets.

Large corporations often have a number of SBUs which each require strategic thought and planning. Strategy means selecting which product or market areas to enter/exit and how to ensure a good competitive position in those markets/products. Establishing a good competitive position requires a consideration of issues such as price, service level, quality, product features, methods of distribution, etc., but these issues are secondary to deciding which products to produce and which markets to enter or exit.

It is the managers of a SBU that are the individuals who come into regular contact with customers in the competitive market environment and it is important that SBU strategy be developed largely by those managers who will be responsible for its execution. By doing this, by harnessing these managers' knowledge and encouraging their commitment through a sense of 'ownership' of a strategy, the firm is more likely to prosper.

Before the creation of new strategic options it is advisable to carry out a review of the value creation of the present strategy. This can be a complex task but an example will demonstrate one approach. Imagine that the plastic products division of Red plc is a defined strategic business unit with a separable strategic planning ability servicing markets distinct from Red's other SBUs. This division sells three categories of product, A, B and C to five types of customer: (a) UK consumers, (b) UK industrial users, (c) UK government, (d) European Union consumers and (e) other overseas consumers. Information has been provided showing the value expected to be created from each of the product/market categories based on current strategy. These are shown in Figures 7.2 and 7.3.

**FIGURE 7.2**  
**Red plc's plastic SBU value creation profile – product line breakdown**

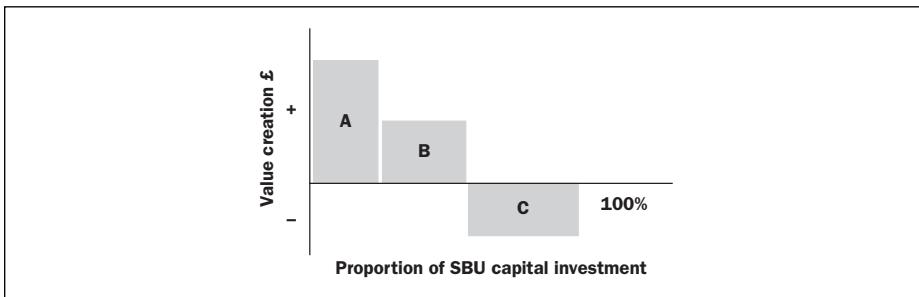
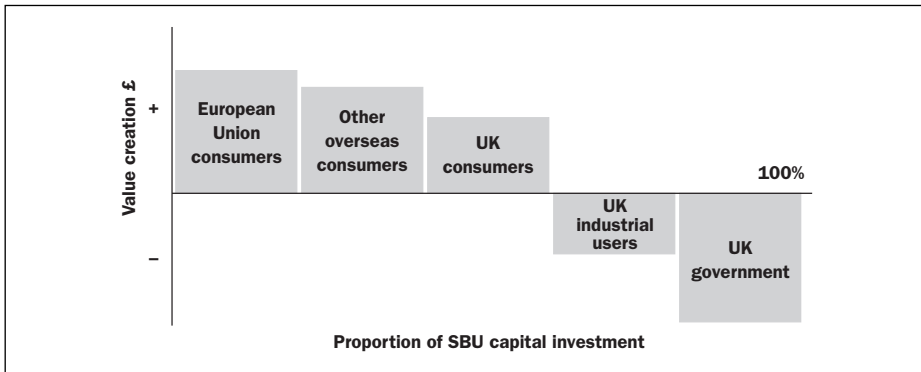


FIGURE 7.3

## Red plc's plastic SBU value creation profile – customer breakdown



Product line C is expected to destroy shareholder value while absorbing a substantial share of the SBU's resources. Likewise this analysis has identified sales to UK industry and government as detrimental to the firm's wealth. This sort of finding is not unusual: many businesses have acceptable returns at the aggregate level but hidden behind these figures are value-destructive areas of activity. The analysis could be made even more revealing by showing the returns available for each product and market category; for example, product A in the UK consumer market can be compared with product A in the European market.

Warren Buffett, the financier, has made some pithy comments on the tendency for firms to fail to identify and root out value-destructive activities:

Many corporations that consistently show good returns both on equity and on overall incremental capital have, indeed, employed a large portion of their retained earnings on an economically unattractive, even disastrous, basis. Their marvellous core businesses, however, whose earnings grow year after year, camouflage repeated failures in capital allocation elsewhere (usually involving high-priced acquisitions of businesses that have inherently mediocre economics). The managers at fault periodically report on the lessons they have learned from the latest disappointment. They then usually seek out future lessons. (Failure seems to go to their heads.)

(Berkshire Hathaway 1984 Annual Report. © Warren Buffett, Reproduced with the permission of the author.)

To get a clear line of sight from the customer to the shareholder many businesses need to build an entirely new fact base showing the full economic cost and cash flows associated with customers and product markets. Recognizing that some activities are far more valuable than others prepares the ground for a shift of strategic resources. Attention can be directed at restructuring or eliminating value destructive operations, while building up value creative aspects of the business.

Furthermore, project appraisal, budgeting systems and the organizational structure of each SBU must be in harmony with the principle of value-based management. Project appraisal will be carried out using discounted cash flow techniques. Budgeting will not rely solely on accounting considerations, but will have value-based metrics (methods of measurement) – some of these are described in the next chapter. The lines of decision-making authority and communication will be the most appropriate given the market environment to achieve greatest returns. For example in a dynamic unpredictable market setting it is unwise to have a bureaucratic, hierarchical type structure with decision-making concentrated at the top of long chains of command. Devolved power and responsibility are likely to produce a more flexible response to change in the market-place, and initiative with self-reliance are to be highly prized and rewarded. In less dynamic environments low cost, close command and control management with an emphasis on continuous improvement is likely to be most appropriate.

Strategic analysis can be seen as having three parts.<sup>1</sup>

- 1. Strategic assessment** – in which the external environment and the internal resources and capability are analyzed to form a view on the key influences on the value-creating potential of the organization.
- 2. Strategic choice** – in which strategic options are developed and evaluated.
- 3. Strategic implementation** – action will be needed in areas such as changes in organizational structure and systems as well as resource planning, motivation and commitment.

## Strategic assessment

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There are three primary strategic determinants of value creation.

### Industry attractiveness

The economics of the market for the product(s) have an enormous influence on the profitability of a firm. In some industries firms have few competitors, and there is low customer buying power, low supplier bargaining power and little threat from new entrants or the introduction of substitute products. Here the industry is likely to be attractive in terms of the returns accruing to the existing players, which will on average exhibit a positive performance spread. Other product markets are plagued with over-capacity, combined with reluctance on the part of the participants to quit and apply resources in another product market. Prices are kept low by the ability of customers and suppliers to ‘put the squeeze on’ and by the availability of very many close-substitute products. Markets of this kind tend to produce negative performance spreads.<sup>2</sup>

## The strength of resources

Identifying a good industry is only the first step. Value-based companies aim to beat the average rates of return on capital employed within their industries. To beat the averages, companies need something special. That something special comes from the bundle of resources that the firm possesses. Most of the resources are ordinary. That is, they give the firm competitive parity. However, the firm may be able to exploit one or two extraordinary resources – those that give a competitive edge. An extraordinary resource is one which, when combined with other (ordinary) resources enables the firm to outperform competitors and create new value-generating opportunities. Critical extraordinary resources determine what a firm can do successfully.

The ability to generate value for customers is crucial for superior returns. High shareholder returns are determined by the firm either being able to offer the same benefits to customers as competitors, but at a lower price; or being able to offer unique benefits that more than outweigh the associated higher price.

Ordinary resources provide a threshold competence. They are vital to ensure a company's survival. In the food retail business, for example, most firms have a threshold competence in basic activities, such as purchasing, human resource management, accounting control and store layout. However, the large chains have resources that set them apart from the small stores: they are able to obtain lower-cost supplies because of their enormous buying power; they can exploit economies of scale in advertising and in the range of produce offered.

Despite the large retailers having these advantages it is clear that small stores have survived, and some produce very high returns on capital invested. These superior firms provide value to the customer significantly above cost. Some corner stores have a different set of extraordinary resources compared with the large groups: personal friendly service could be valued highly; opening at times convenient to customers could lead to acceptance of a premium price; the location may make shopping less hassle than traipsing to an out-of-town hypermarket. The large chains find emulation of these qualities expensive. If they were to try and imitate the small store they could end up losing their main competitive advantages, the most significant of which is low cost.

The extraordinary resources possessed by the supermarket chains as a group when compared with small shops are not necessarily extraordinary resources in the competitive rivalry *between* the chains. If the focus is shifted to the 'industry' of supermarket chains factors like economies of scale may merely give competitive parity – scale is needed for survival. Competitive advantage is achieved through the development of other extraordinary resources, such as the quality of the relationship with suppliers, a very sophisticated system for collecting data on customers combined with target marketing, ownership of the best sites. However, even these extraordinary resources will not give superior competitive position forever. Many of these can be imitated. Long-term competitive advantage may depend on the capabilities of the management team to

continually innovate and thereby shift the ground from under the feet of competitors. The extraordinary resource is then the coherence, attitude, intelligence, knowledge and drive of the managers in the organizational setting.

Many successful companies have stopped seeing themselves as bundles of product lines and businesses. Instead they look at the firm as a collection of resources. This helps to explain the logic behind some companies going into apparently unconnected product areas. The connection is the exploitation of extraordinary resources. So, for example, Honda has many different product areas: motor boat engines, automobiles, motorcycles, lawn mowers and electric generators. These are sold through different distribution channels in completely different ways to different customers. The common root for all these products is Honda's extraordinary resource that led to a superior ability to produce engines. Likewise, photocopiers, cameras and image scanners are completely different product sectors and sold in different ways. Yet, they are all made by Canon – which has extraordinary capabilities and knowledge of optics, imaging and microprocessor controls.

The analyst should not be looking for a long list of extraordinary resources in any one firm. If one can be found, that is good – it only takes one to leap ahead of competitors and produce super-normal returns. If two are found then that is excellent. It is very unusual to come across a company that has three or more extraordinary resources. Coca-Cola is an exception with an extraordinary brand, a distribution system with connected relationships and highly knowledgeable managers.

**The TRRACK system**

To assist the thorough analysis of a company's extraordinary resource I have developed the TRRACK system. This classifies extraordinary resources into six categories – see Figure 7.4.

**FIGURE 7.4**  
**The TRRACK system**

T	Tangible
R	Relationships
R	Reputation
A	Attitude
C	Capabilities
K	Knowledge

Notice that the vast majority of extraordinary resources are intangible. They are qualities that are carried within the individuals that make up organizations, or are connected with the interaction between individuals. They are usually developed over a long time rather than bought. These qualities cannot be scientifically evaluated to provide objective quantification. Despite our inability to be precise it is usually the case that these people-embodied factors are the most important drivers of value creation and we must pay most attention to them.

**Tangible**

Occasionally physical resources provide a sustainable competitive advantage. These are assets that can be physically observed and are often valued (or misvalued) in a balance sheet. They include real estate, materials, production facilities and patents. They can be purchased, but if they were easily purchased they would cease to be extraordinary because all competitors would go out and buy. There must be some barrier preventing other firms from acquiring the same or similar assets for them to be truly valuable in the long run. Microsoft's ownership of its operating system and other standards within the software industry gives it a competitive edge. McDonald's makes sure that it takes the best locations on the busiest highways, rather than settle for obscure secondary roads. Many smaller businesses have found themselves, or have made smart moves to ensure they are, the owners of valuable real estate adjacent to popular tourist sites. Pharmaceutical companies, such as Merck, own valuable patents giving some protection against rivalry – at least temporarily.

**Relationships**

Over time companies can form valuable relationships with individuals and organizations that are difficult or impossible for a potential competitor to emulate. Relationships in business can be of many kinds. The least important are the contractual ones. The most important are informal or implicit. These relationships are usually based on a trust that has grown over many years. The terms of the implicit contract are enforced by the parties themselves rather than through the court – a loss of trust can be immensely damaging. It is in all the parties' interests to cooperate with integrity because there is the expectation of reiteration leading to the sharing of collective value created over a long period. South African Breweries (SAB) has 98 percent of the beer market in South Africa. It has kept out foreign and domestic competitors because of its special relationships with suppliers and customers. It is highly profitable, and yet, for the last two decades it has reduced prices every year – the price of beer has halved in real terms. Most of South Africa's roads are poor and electricity supplies are intermittent. To distribute its beer it has formed some strong relationships. The truck drivers, many of whom are former employees, are helped by SAB to set up their small trucking businesses. *Shebeens* sell most of the beer. These are unlicensed pubs. Often, they are tiny – no more than a few benches. SAB cannot sell directly to the illegal *shebeens*. Instead it maintains an informal relationship via a system of wholesalers. SAB makes sure that distributors have refrigerators and, if necessary, generators. A new entrant to the market would have to develop its own special relationship with truck drivers, wholesalers and retailers. In all likelihood it would have to establish a completely separate and parallel system of distribution. Even then it would lack the legitimacy that comes with a long-standing relationship. Relationships between employees, and between employees and the firm, can give a competitive edge. Some firms seem to

possess a culture that creates wealth through the cooperation and dynamism of the employees. Information is shared, knowledge is developed, innovative activity flows, rapid response to market change is natural and respect for all pervades. The quality of the relationships with government can be astonishingly important to a company. Defence contractors cultivate a special relationship with various organs of government. The biggest firms often attract the best ex-government people to take up directorships or to head liaison with government. Their contacts and knowledge of the inside workings of purchasing decisions, with the political complications, can be very valuable. A similar logic often applies to pharmaceutical companies, airlines and regulated companies.

### **Reputation**

Reputations are normally made over a long period. Once a good reputation is established it can be a source of very high returns (assuming that all the necessary ordinary resources are in place to support it). With car hire in a foreign country the consumer is unable to assess quality in advance. Hertz provide certification for local traders under a franchise arrangement. These local car hirers would see no benefit to providing an above-average service without the certification of Hertz because they would not be able to charge a premium price.<sup>3</sup> It is surprising how much more consumers are willing to pay for the assurance of reliable and efficient car hire when they travel abroad compared with the hiring of a car from an unfranchised local. Companies pay a large premium to hire Goldman Sachs when contemplating an issue of securities or a merger. They are willing to pay for 'emotional reassurance'.<sup>4</sup> The CEO cannot be sure of the outcome of the transaction. If it were to fail the penalty would be high – executives may lose bonuses, and, perhaps their jobs, shareholders lose money. The CEO therefore hires the best that is available for such once-in-a-lifetime moves. The cost of this hand-holding is secondary. Once an adviser has a history of flawless handling of large and complex transactions it can offer a much more effective 'emotional comfort-blanket'<sup>5</sup> to CEOs than smaller rivals. This principle may apply to pension fund advisers, management consultants and advertising agencies as well as top investment bankers. Perhaps the most important manifestation of the importance of reputation is branding. Branded products live or die by reputation. A strong brand can be incredibly valuable.

### **Attitude**

Attitude refers to the mentality of the organization. It is the prevalent outlook. It is the way in which the organization views and relates to the world. Terms such as disposition, will and culture are closely connected with attitude. Every sports coach is aware of the importance of attitude. The team may consist of players with the best technique in the business or with a superb knowledge of the game, they may be the fastest and the most skilful, but without a winning attitude they will not succeed. There must be a will to win. Attitude can become entrenched within an organization. It is difficult to shake off a negative attitude. A positive attitude

can provide a significant competitive edge. Some firms develop a winning mentality based on a culture of innovation, others are determinedly oriented towards customer satisfaction while some companies are quality driven. 3M, has a pervasive attitude of having-a-go. Testing out wild ideas is encouraged. Employees are given time to follow up a dreamed-up innovation, and they are not criticized for failing. Innovations such as 'Post-it' notes have flowed from this attitude. Canon has the attitude of *Tsushin* – 'heart-to-heart and mind-to-mind communication' between the firm and its customers. In this way trust is developed.

### **Capabilities**

Capabilities are derived from the company's ability to undertake a set of tasks. The term skill can be used to refer to a narrow activity or a single task. Capability is used for the combination of a number of skills.<sup>6</sup> For example, a company's capability base could include abilities in narrow areas such as market research, innovative design and efficient manufacturing that, when combined, result in a superior capability in new product development. A capability is more than the sum of the individual processes – the combination and coordination of individual processes may provide an extraordinary resource. Sony developed a capability in miniaturization. This enabled it to produce a string of products from the Walkman to the Playstation.

### **Knowledge**

Knowledge is the awareness of information, and its interpretation, organization, synthesis and prioritization, to provide insights and understanding. The retention, exploitation and sharing of knowledge can be extremely important in achieving and maintaining competitive advantage. All firms in an industry share basic knowledge. For example, all publishers have some knowledge of market trends, distribution techniques and printing technology. It is not this common knowledge that I am referring to in the context of extraordinary resources. If a publisher builds up data and skills in understanding a particular segment of the market, say investment books, then its superior awareness, interpretation, organization, synthesis, and prioritization of information can create competitive advantage through extraordinary knowledge. The company will have greater insight than rivals into this segment of the market. There are two types of organizational knowledge. The first, *explicit* knowledge, can be formalized and passed on in codified form. This is objective knowledge that can be defined and documented. The second, *tacit* knowledge, is ill- or undefined. It is subjective, personal and context specific. It is fuzzy and complex. It is hard to formalize and communicate. Examples of explicit knowledge include costing procedures written in company accounting manuals, formal assessment of market demand, customer complaint data and classification. Explicit knowledge is unlikely to provide competitive advantage: if it is easily defined and codified it is likely to be available to rivals. Tacit knowledge, on the other hand, is very difficult for rivals to obtain. Consider the analogy of a baseball: explicit knowledge of tactics is generally available; what separates the excellent from the ordinary player is the application of tacit knowledge, e.g. what becomes



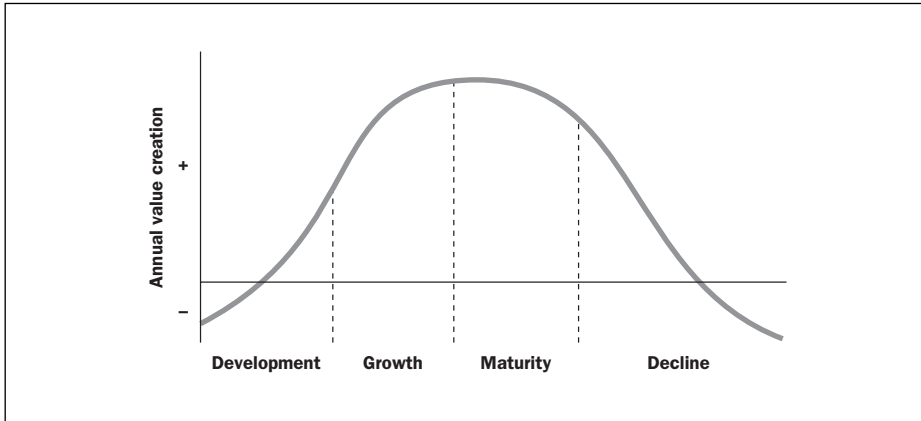
an instinctive ability to recognize types of pitches and the appropriate response to them. Tacit knowledge is transmitted by doing, the main means of transferring knowledge from one individual to another is through close interaction to build understanding, as in the master-apprentice relationship.

If you would like to delve more deeply into competitive resource analysis there are fuller discussions in Chapter 10 of *Valuegrowth Investing*, Arnold (2002) and Chapter 15 of *The Financial Times Guide to Investing*, Arnold (2004).

### **Life-cycle stage of value potential**

A competitive advantage in an attractive industry will not lead to superior long-term performance unless it provides a *sustainable* competitive advantage and the economics of the industry *remain* favorable. Rival firms will be attracted to an industry in which the participants enjoy high returns and sooner or later competitive advantage is usually whittled away. The longevity of the competitive advantage can be represented in terms of a life cycle with four stages: development, growth, maturity and decline (*see* Figure 7.5). In the development phase during which competitive advantage (and often the industry) is established, perhaps through technological or service innovation, the sales base will be small. As demand increases a growth phase is entered in which competitive strength is enhanced by factors such as industry leadership, brand strength and patent rights. A lengthy period of competitive advantage and high return can be expected. Eventually the sources of advantage are removed, perhaps by competitor imitation, or by customers and suppliers gaining in bargaining power. Other possibilities pushing towards the maturity stage are technological breakthroughs by competitors able to offer a superior product, or poor management leading to a loss of grip on cost control. Whatever the reason for the reduction in the performance spread, the firm now faces a choice of three routes, two of which can lead to a repositioning on the life cycle; the third is to enter a period of negative performance spreads. The two positive actions are (a) to erect barriers and deterrents to the entry of firms to the industry. Barriers put in the path of the outsiders make it difficult for those insects to advance on your honey pot. Also, a clear message could go out to the aspiring entrant that if they did dare to cross the threshold then they will be subject to a massive retaliatory attack until they are driven out again, and (b) to continually innovate and improve the SBU's product offering to stay one step ahead of the competitors. An example of the simultaneous use of those two actions is provided by Microsoft. It is able to dominate the operating software market and the application market because of the network effect of Office being a standard system used throughout the world and because of its close working relationships with hardware producers; this makes life very difficult for any potential new entrant. It is also pumping billions into new products – it has thousands of software engineers. But even Microsoft will find its business units eventually fall into a terminal decline phase of value creation because of a loss of competitive advantage. When it does, even though it will be extremely difficult for it to do so, the company must withdraw from value-destructive activities and plow the capital retrieved into positive performance-spread SBUs.

**FIGURE 7.5**  
The life-cycle stages of value creation

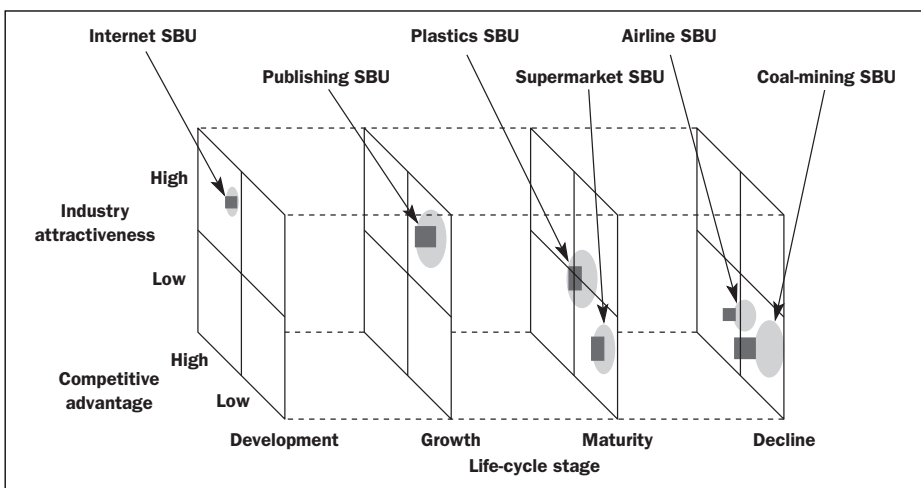


### Strategy planes

The three elements of strategic assessment can be summarized on a strategy planes chart like the one shown in Figure 7.6 for Red plc which, besides the plastics SBU, also has a young internet games division, a coal-mining subsidiary, a publishing group with valuable long-term copyrights on dozens of best sellers, a supermarket chain subject to increasingly intense competition in an over-supplied market and a small airline company with an insignificant market share.

The strategy planes framework can be used at the SBU level or can be redrawn for product/customer segments within SBUs.

**FIGURE 7.6**  
Strategy planes



Note: The size of the circle represents the proportion of the firm's assets devoted to this SBU. The size of the rectangle represents the current performance spread. If the spread is negative it is shown outside the circle.

## Strategic choice

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Managers need to consider a wide array of potential strategic options. The process of systematic search for alternative market product entry/exit and competitive approaches within markets is vital. The objective of such a search is to find competitive advantage in attractive markets sustainable over an extended period of time yielding positive performance spreads.

There are two proven types of strategies to achieve sustainable competitive advantage:

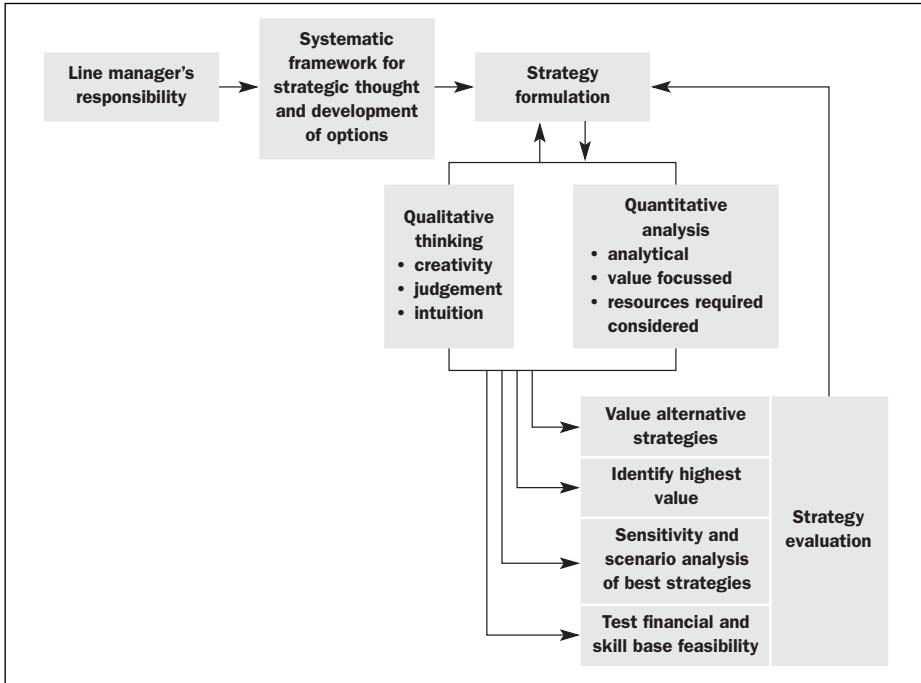
- *A cost leadership strategy* – a standard no-frills product. The emphasis here is on scale economies or other cost advantages.
- *A differentiation strategy* – the uniqueness of the product/service offering allows for a premium price to be charged.

To fall between these two stools can be disastrous.

Once a sufficiently wide-ranging search for possible strategic directions has been conducted the results that come to the fore need to be evaluated. They are usually considered in broad descriptive terms using qualitative analysis with written reports and reflective thought. This qualitative thinking has valuable attributes such as creativity, intuition and judgment in the original formulation of strategic options, the assessment of their merits and in the subsequent reiterations of the process. The qualitative strategy evaluation is complemented by a quantitative examination for which accounting terms such as profit, earnings per share (eps), return on capital employed (ROCE) and balance sheet impact are traditionally used. This has the advantage of presenting the strategic plans in the same format that the directors use to present annual results to shareholders. However these metrics do not accurately reflect the shareholder value to be generated from alternative strategic plans. The value-based metrics such as economic profits and discounted cash flow described in the next chapter are more appropriate.

Figure 7.7 shows the combination of qualitative assessment and quantitative analysis of strategic options. When a shortlist of high-value-creating strategies has been identified, sensitivity and scenario analysis of the kinds described in Chapter 5 can be applied to discover the vulnerability of the 'most likely' outcome to changes in the input factors such as level of sales or cost of materials. The company also needs to consider whether it has the financial resources necessary to fund the strategy. The issues of finance raising, debt levels and dividend policy come into the equation at this point. Other aspects of feasibility include whether the organization has the skill base necessary to provide the required quality of product or service, whether it is able to gain access to the required technology, materials, services and so on.

**FIGURE 7.7**  
**Strategy formulation and evaluation**



## Strategy implementation

Making the chosen strategy work requires the planned allocation of resources and the reorganization and motivation of people. The firm's switch to value-based principles has an impact on these implementation issues. Resources are to be allocated to units or functions if it can be shown that they will contribute to value creation after taking into account the quantity of resources used. Managers are given responsibilities and targets set in accordance with value creation.

## What use is the head office?

So far the firm has been described as consisting of a group of strategic business units. So where does the head office fit into this picture if each of these units has separately identifiable market and is capable of independent strategic action?

We know that companies need to apply value-based principles to all its activities and so this must include the center. Everything the head office does must create value for shareholders. This means awareness of the quantity of assets used in each task and the return generated by those assets in that task. Many companies fail to think this through; head office costs spiral as new activities are

taken to the center to add to those traditionally carried out, without thought as to whether these tasks are (a) necessary, or (b) if necessary, most efficiently executed by the center.

In a value-based company the role of the corporate center (head office) has four main aspects:

- *Portfolio planning* – allocating resources to those SBUs and product and/or customer areas offering the greatest value creation while withdrawing capital from those destroying value.
- *Managing strategic value drivers shared by two or more SBUs* – these crucial extraordinary resources, giving the firm competitive advantage, may need to be centrally managed or at least coordinated by the center to achieve the maximum benefit. An example here could be strong brand management or technological knowledge. The head office needs to ensure adequate funding of these and to achieve full, but not over-exploitation.
- *Provide the pervading philosophy and governing objective* – training, goal setting, employee rewards and the engendering of commitment are all focussed on shareholder value. A strong lead from the center is needed to avoid conflict, drift and vagueness.
- *The overall structure of the organization* needs to be appropriate for the market environment and designed to build value. Roles and responsibilities are clearly defined with clear accountability for value creation.

We can apply the principles of portfolio planning to Red plc. The corporate center could encourage and work with the plastics division in developing ideas for reducing or eliminating the value losses being made on some of its products and markets – recall that it is destroying value in product line C and in sales to UK industrial customers and the UK government. Once these have been fully evaluated head office could ensure that resources and other services are provided to effectively implement the chosen strategy. For example, if the highest value-creating option is to gradually withdraw capital from product line C and to apply the funds saved to product line A, the management team at C are likely to become demotivated as they reduce the resources under their command and experience lower sales (and profit) rather than, the more natural predisposition of managers, a rising trend. The center can help this process by changing the targets and incentives of these managers away from growth and empire building towards shareholder value.

On the level of corporate-wide resource allocation, the directors of Red plc have a great deal of work to do. The publishing division is already creating high value from its existing activities, yet it is still in the early growth phase. The subsidiary management team believe that significant benefits would flow from buying rights to other novels and children's stories. By combining these with its present 'stable' it could enter more forcefully into negotiations with book retailers, television production companies wishing to make screen versions of its

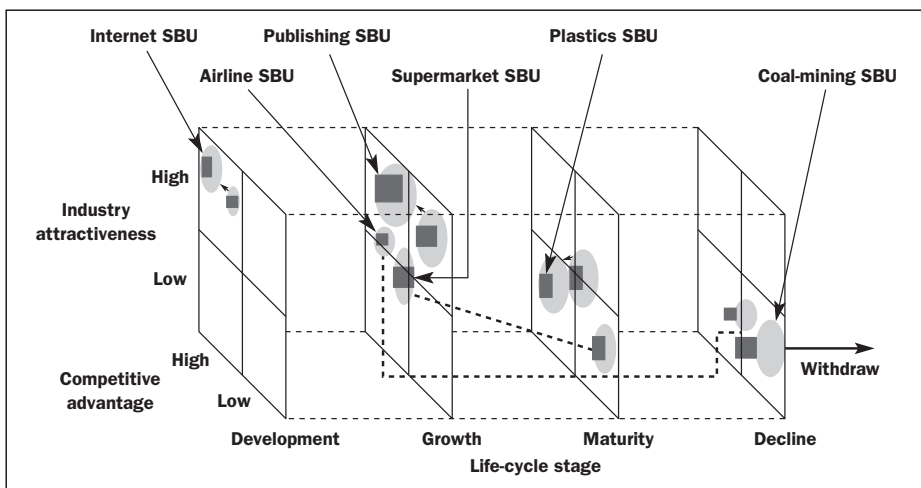
stories and merchandising companies intending to put the image of some of the famous characters on articles ranging from T-shirts to drink cans. This strategy will involve the purchase of rights from individual authors as well as the acquisition of firms quoted on the stock exchange. It will be costly and require a substantial shift of resources within the firm. But, as can be seen from Figure 7.8, the value created makes the change attractive.

The internet division has been put on a tight rein in terms of financial resources for its first three years because of the high risk attached to businesses involved in speculative innovation in this market. However, the energetic and able managers have created a proven line of services that have a technological lead over competitors, a high market share and substantial barriers to entry in the form of copyrights and patents. The directors decide to expand this area.

The plastics division as a whole is in a mature market with positive but gradually declining performance spreads. Here the strategic approach is to reduce the number of product lines competing on cost and transfer resources to those niche markets where product differentiation allows a premium price to be charged. The intention is to move gradually to a higher competitive advantage overall but accept that industry attractiveness will decline. Overall resources dedicated to this division will remain approximately constant, but the directors will be watching for deterioration greater than that anticipated in the current plan.

The supermarket division is currently producing a positive performance spread but a prolonged price war is forecast for the industry, to be followed by a shake-out, leading to a withdrawal of many of the current firms. Some directors are in favor of supporting this division vigorously through the troublesome times

**FIGURE 7.8**  
Using strategy plane analysis.  
Red plc's shifting strategy planes



Note: The size of the circle represents the proportion of the firm's assets devoted to this SBU. The size of the rectangle represents the current performance spread. If the spread is negative it is shown outside the circle.

ahead in the expectation that when many of the weaker players have left the field, margins will rise to abnormally high levels – producing large performance spreads and high value in the long run. In terms of the value-creating life cycle this SBU would be shifted from the maturity strategy plane to the growth plane (shown in Figure 7.8). Other directors are not willing to take the risk that their firm will not be one of the survivors from the battle for market share. Furthermore, they argue that even if they do win, the enormous resources required, over the next five years, will produce a value return less than that on the publishing or internet SBUs. Therefore, if financial resources are to be constrained, they should put money into these ‘star’ divisions.

The coal-mining division is hemorrhaging money. The industry is in terminal decline because of the high cost of coal extraction and the increasing tendency for the electricity-generating companies to source their coal needs from abroad. Moreover Red is a relatively small player in this market and lacks the economies of scale to compete effectively. To add insult to injury a large proportion of the corporation’s capital is tied up in the coal stockpiles required by the electricity firms. The decision is taken to withdraw from this industry and the best approach to achieve this is investigated – sale to a competitor or liquidation.

The airline operation has never made a satisfactory return and is resented by the managers in other divisions as a drain on the value they create. However, the recent deregulation of air travel and especially the opening up of landing slots at major European airports has presented a major new opportunity. Despite being one of the smallest operators, so unable to compete on price, it provides a level of service which has gained it a high reputation with business travelers. This, combined with its other major value driver, the strength of its marketing team, leads the divisional managers and the once skeptical directors to conclude that a sufficiently high premium ticket price can be charged to produce a positive performance spread. The new European rules enable the division to be placed on the growth plane as the spread is thought to be sustainable for some time.

The analysis in Figure 7.8 of Red’s corporate strategy is an extremely simplified version of strategy development in large corporations where thousands of man-hours are needed to develop, evaluate and implement new strategic plans. Strategy is a complex and wide-ranging practical academic discipline in its own right and we can only scratch the surface in this chapter.

## Targets and motivation

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The remaining aspects of management affected by a switch from an earnings-based approach to a value-based approach shown in Figure 7.1 have already been touched on and, given the scope of this book, will not be explained any further here. The interested reader can consult some of the leading writers in this area (see McTaggart *et al.* (1994), Copeland *et al.* (1996), Rappaport (1998), Stewart (1991) and Reimann (1989)). The financial structure debate concerning

the proportion of debt in the overall capital mix of the firm is discussed in Chapters 10 and 18 and the dividend payout ratio debate is described in Chapter 14.

One final point to note with regard to Figure 7.1 is the importance of having different types of value-creating targets at different levels within the organization. At board room and senior executive level it seems reasonable that there should be a concern with overall performance of the firm as seen from the shareholders' perspective and so total shareholder return, wealth added index, market value added and market to book ratio (metrics described in Chapter 9) would be important guides to performance, and incentive schemes would be (at least partially) based upon them. Economic profit, economic value added and discounted cash flow are also useful guides for senior managers. These metrics are described and critically assessed in the next chapter.

Moving down the organization, target setting and rewards need to be linked to the level of control and responsibility over outcomes. Strategic business unit performance needs to be expressed in terms of value metrics such as discounted cash flow, economic profit, and economic value added. Outcomes are usually under the control of divisional and other middle-ranking managers and so the reward system might be expressed in terms of achieving targets expressed in these metrics. At the operating level where a particular function contributes to value creation but the managers in that function have no control over the larger value center itself, perhaps the emphasis should shift to rewarding high performance in particular operational value drivers such as throughput of customers, reduced staff turnover, cost of production, faster debtor turnover, etc.

*Key rule: All managers should agree to both short- and long-term targets.* This counters the natural tendency in all of us to focus on short-term goals that might not be optimal in the long run.

### Case study 7.1

#### Strategy, planning and budgeting at Lloyds TSB

Although business units are responsible for their own strategy development, the Lloyds TSB group provides guidelines on how strategy should be developed. ... These unit plans are then consolidated into an aggregate plan for the value centre. The process undertaken is then subjected to scrutiny by the centre. The strategic planning process consists of five stages:

- (1) **Position assessment.** Business units are required to perform a value-based assessment of the economics of the market in which the business operates and of the relative competitive position of the business within that market. Market attractiveness and competitive position must include a numerical rather than a purely qualitative assessment.
- (2) **Generate alternative strategies.** Business units are required to develop a number of realistic and viable alternatives.
- (3) **Evaluate alternative strategies.** Business units are required to perform shareholder value calculations in order to prioritise alternatives. Even if a potential strategy has a high positive



net present value, this does not necessarily mean that it will be accepted. An assessment of project risk or do-ability is overlaid across the net present value calculations.

- (4) **Agree chosen strategy with the centre.** Whilst it is perceived to be vital that the managers who best understand their business are given sufficient authority to develop strategies which they consider to be most appropriate, it is nevertheless considered equally important that there is a challenge mechanism at the centre to ensure that appropriate analyses have been performed and assumptions made are credible.
- (5) **The chosen strategy becomes a contract.** Once the preferred strategy has been agreed with the centre, resource allocation and milestones are agreed. Budgetary performance targets are derived from the projections included within the strategic plan. Beyond this, however, business unit managers are free to choose whatever structures and performance indicators are considered to be relevant and appropriate.

Source: 'Lessons from practice: VBM at Lloyds TSB', by M. Davies in G. Arnold and M. Davies (eds), *Value-Based Management*. 2000 © John Wiley & Sons Limited. Reproduced with permission.

## Conclusion

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A commercial organization that adopts value principles is one that has an important additional source of strength. The rigorous thought process involved in the robust application of these principles will force managers to review existing systems and product and market strategies and to bring an insistence on a contribution to shareholder value from all parts of the company. A firm that has failed to ask the right questions of its operating units or use the correct metrics in measuring performance will find its position deteriorating *vis-à-vis* its competitors.

## Notes

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- 1 See Johnson and Scholes (2001) for more detail.
- 2 For more detail on market attractiveness analysis consult Arnold, G. (2002) *Valuegrowth Investing*. London: Financial Times Prentice Hall (Chapter 9) of Arnold, G. (2004) *The Financial Times Guide to Investing*. London: Financial Times Prentice Hall (Chapter 14) or any major textbook on strategy. Michael Porter is a leading writer in the field of strategy.
- 3 Kay, J. (1993) *Foundations of Corporate Success*. New York: Oxford University Press. A study of corporate strategy.
- 4 Martin, P. (1998) 'Goldman's goose', *Financial Times*, 11 August, p. 14. Why Goldman Sachs can charge a large amount for advice.
- 5 *Ibid.*
- 6 De Wit, B. and Meyer, R. (1998) *Strategy: Process, Content, Context*. 2nd edn. London.

# MEASURES OF VALUE CREATION

Introduction

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Using cash flow to measure value

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Shareholder value analysis

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Economic profit

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Economic value added

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Cash flow return on investment

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Conclusion

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## Introduction

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Managers at all levels need to establish plans for future actions. In drawing up these plans they need reliable measures of value to choose between alternative paths. The metrics discussed in this chapter are useful for this purpose.

Then, as strategic moves at both the corporate level and the business unit level unfold, managers need to monitor progress to see if they are still on-track to create value. Again, these metrics can be useful. Targets can be set, and, as milestones are passed, incentive schemes can bestow a share of the value created on those responsible. The aim is to make sure every member of staff understands what value is, and each person becomes fully committed to creating it.

At each level of responsibility there should be knowledge of how much of the finance provider's cash has been used in an SBU, product line or project and the required rate of return on that capital. Everyone should know that extra rewards flow to those that help achieve returns above the required rate of return.

The metrics discussed in this chapter quantify the plan, targets and incentives to encourage high performance from the boardroom to the shop floor. They can be used to judge the entire firm or just a small part of it.

## Using cash flow to measure value

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We discuss a number of measures of value in this and the next chapter. There is a hot debate between rival consultants as to which is the best for guiding managers seeking to create value. However, they all agree that the measure that lies at the theoretical heart of all the others is discounted cash flow.

In Chapter 2 the value of an investment is described as the sum of the discounted cash flows (NPV). This principle was applied to the assessment of a new project: if the investment produced a rate of return greater than the finance provider's opportunity cost of capital it is wealth enhancing. The same logic can be applied to a range of different categories of business decisions, including:

- resource allocation
- business unit strategies
- corporate level strategy
- motivation, rewards and incentives.

Consider the figures for Gold plc in Table 8.1. These could refer to the entire company. Alternatively the figures could be for business unit returns predicated on the assumption of a particular strategy being pursued, or they could be for a product line. (Note: to understand this chapter the reader needs the concepts and tools developed in Chapter 2 and its appendix. You may want to refresh your knowledge of basic discounted cash flow analysis before proceeding.)

**TABLE 8.1****Gold plc forecast cash flows**

Required rate of return = 12% per annum

Year	1	2	3	4	5	6	7	8 and subsequent years
	£	£	£	£	£	£	£	£
Forecast profits	1,000	1,100	1,100	1,200	1,300	1,450	1,600	1,600
Add book depreciation and other non-cash items (e.g. amortization of goodwill)	500	600	800	800	800	800	800	800
Less fixed capital investment	-500	-3,000	-600	-600	-300	-600	-800	-800
Less additional investment in working capital*								
Inventory	50	-100	-70	-80	-50	-50	-50	0
Debtors	-20	-20	-20	-20	-20	-20	-20	0
Creditors	10	20	10	10	20	20	30	0
Cash	-10	-10	-10	-10	-10	-10	-10	0
Add interest previously charged to profit and loss account	100	150	200	200	200	200	200	200
Taxes	-300	-310	-310	-420	-450	-470	-550	-550
Cash flow	830	-1,570	1,100	1,080	1,490	1,320	1,200	1,250
Discounted cash flow	$\frac{830}{1.12}$	$-\frac{1,570}{(1.12)^2}$	$+\frac{1,100}{(1.12)^3}$	$+\frac{1,080}{(1.12)^4}$	$+\frac{1,490}{(1.12)^5}$	$+\frac{1,320}{(1.12)^6}$	$+\frac{1,200}{(1.12)^7}$	$+\frac{1,250}{0.12} \times \frac{1}{(1.12)^7}$
	<b>741</b>	<b>-1,252</b>	<b>783</b>	<b>686</b>	<b>845</b>	<b>669</b>	<b>543</b>	<b>4,712</b>

\*A positive figure for inventory, debtors and cash floats indicates cash released from these forms of investment. A negative figure indicates additional cash devoted to these areas. For creditors a positive figure indicates higher credit granted by suppliers and therefore a boost to cash flows.

Table 8.1 starts with forecasted profit figures and then makes a number of adjustments to arrive at cash flow figures. This method is valuable because it reflects the corporate reality that forward estimates for business units are usually in the form of accounting budgets rather than cash flows, and managers need to know how to work from these numbers toward cash flow rather than starting from scratch to obtain reliable cash flow projections.

Profit figures are created after a number of deductions, such as depreciation, that do not affect the company's cash flow for the year. When an item is depreciated in the accounts profits are reduced but no cash is lost. It is only when capital items are paid for that cash actually flows out, so depreciation is added to the profit figures. Instead of depreciation we take away the amount that actually flows out each year for investment in fixed capital equipment such as factories, machinery and vehicles (fixed capital investment).

In drawing up the profit figures the accountant does not recognize the using-up of shareholder's cash when inventory (e.g. raw materials stock) or debtors (granting credit to customers) are increased. The accountant observes one asset (cash in hand) being replaced by another (inventory, money owed by customers) and so there is no expense to deduct. However, the cash flow analyst sees cash being used for these items as the business grows and so makes an adjustment to the profit figures when deriving the cash flow numbers.

Similarly, if cash is tied up in cash floats to run the business (e.g. cash in the tills of a betting shop or food retailer) the fact that this cash is no longer available to shareholders needs to be recognized. So, if shareholders had to supply extra cash floats in a period this is deducted from the profit numbers when trying to get at cash flow.

Whether suppliers send input goods and services to this firm for payment on 'cash on delivery terms' or 'credit terms' the accountant, rightly, records the value of these as an expense, and deducts this from the profit and loss account, in the year of delivery. The cash flow analyst needs to make an adjustment here because the full amount of the expense may not yet have flowed out in cash. So, if creditor balances increase we need to recognize that the profit and loss account has overstated the outflow of cash. We need then to add back the extent to which the creditor amount outstanding has increased from the beginning of the year to the end to arrive at the cash flow figure.

We also add back the interest charged to the profit because the 12 percent discount rate already includes an allowance for the required return to lenders (see Chapter 10). To include a deduction for interest in calculating cash flow would be to double count this element.

The cash flow figures at the bottom of the columns are sometimes referred to as 'free cash flow'. That is they represent the amount that is free to be paid out to the firm's investors (shareholders and debt holders). These amounts could be paid out without affecting future cash flows because the necessary investment for future growth in the form of fixed capital items and working capital (inventory, debtor, cash floats less trade credit) is already allowed for.

The total of the discounted cash flows provides us with a value of the SBU (or firm, etc.) after taking into account all the cash inflows/outflows and reducing those distant cash flows by the required rate of return (the opportunity cost of capital). This discount rate is based on a blend of the required return to shareholders capital and the required return to debt holders capital. Chapter 10 describes the logic behind the derivation of the discount rate, which is a weighted average of the required returns to equity and debt.

By examining the discounted cash flow the SBU management and the firm's managing director can assess the value contribution of the SBU. The management team putting forward these projected cash flows could then be judged and rewarded on the basis of performance targets expressed in cash flow terms. On the other hand, the cash flows may refer to a particular product line or specific customer(s). At each of these levels of management a contribution to overall corporate value is expected.

The planning horizon<sup>1</sup> is seven years and so the present value of the future cash flows is:

Present value of cash flows within planning horizon	+	Present value of cash flows after planning horizon	
741 - 1,252 + 783 + 686 + 845 + 669 + 543	+	4,712	
£3,015		£4,712	= <b>£7,727</b>

In analysis of this kind it is not unusual to find that most of the value arises after the planning horizon. However, bear in mind that it is the actions (strategic positioning etc.) and the investments made within the planning horizon that creates the platform for these high post planning horizon free cash flows.

Note that in the case of Gold we have not shown a large initial cash outflow, in contrast to the NPV calculations described in the first part of the book. This is to illustrate how you can use discounted cash flow analysis to analyze the present value of the future cash flows (not *Net* present value) of an SBU etc. that was established years before, and you do not have the start-up costs to consider – this type of analysis only considers the future cash inflows and outflows, not the bygone (sunk?) costs.

The value shown in the calculation based on one particular strategic direction (say the result from Table 8.1) can be compared with alternatives to see which is likely to provide the highest value. You could also conduct sensitive and scenario analysis (see Chapter 5) to highlight areas of concern and in order that managerial attention may be directed to reduce the probability of a poor outcome.

### Corporate value

If the SBU that we are valuing has other assets that are not used in the creation of free cash flow and those assets have a market value then we add this to the total of the discounted operational cash flow to arrive at the total firm value. For example, many firms hold portfolios of shares or bonds as investments with no connection to the firm’s operations. The market value of these adds to the value of the firm derived from the operational free cash flow. Likewise, if a company owns an empty and unused factory which could be sold its value can be added to the total.

Corporate value (enterprise value)	=	Present value of free cash flow from operations	+	Value of non-operating assets
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### Comparing the discounted free cash flows with alternatives

The figure of £7,727 is the present value of all the future operating cash flows. An alternative course of action is to sell off the SBU’s assets, either piecemeal or as a whole. We should compare these alternatives with the present value of continuing to own and run the business. The opportunity cost of following the strategy is the value of the best forgone alternative.

### Shareholder value from operations

If the value of debt is deducted from the total present value from operations we derive the value belonging to shareholders. So, if we assume that this SBU has £3,000 of debt the shareholder value before taking account of non-operational assets is £4,727.

Total discounted free cash flow from operations	-	Debt	=	Shareholder value from operations
£7,727	-	£3,000	=	£4,727

The term ‘debt’ here extends beyond interest bearing debt to include finance lease obligations, under funded pension plans and contingent liabilities.

## Real management is not about precise numbers – it's about what lies behind the numbers

By embarking on cash flow based analysis the decision-maker is forced to investigate and understand the underlying business. Only by thorough examination is he/she going to put realistic numbers into the future projection table. This means a knowledge of the competitive environment and the extraordinary resources that the firm possesses to produce high returns in its chosen industry(ies) – see Chapter 7. In other words, the decision-maker needs to investigate the key 'value drivers' in the company and the industry.

However there is a trap here for the unwary and ill-informed. A manager lacking the intellectual tools, theoretical frameworks and facts to carry out high quality strategic analysis will produce simplistic and misleading input numbers to the cash flow forecasts: GIGO – garbage in/garbage out.

Value-based management is not a mechanical discipline. It is not about inputting a few numbers to a computer program and then waiting until *the* answer pops out. It is a process requiring judgment every step of the way; it requires careful reflection on the results and their sensitivity to the input numbers. Deep thought is required to appreciate the impact of making slightly (or greatly) different judgments on the input variables; and in assessing the probabilities of variations occurring. Value-based management is a decision-making-in-a-haze-of-uncertainty discipline. How can it be otherwise if it is to be useful in the real world of unpredictability and vagueness. But it gives us a framework and the tools for navigating the best judged route given these circumstances.

A premium is put on people who can make good judgment calls despite the imprecision. These people search for more data to try to see through the haze of the future. More data also leads to thought and action designed to reduce the range of probable outcomes.

### Investment after the planning horizon

After the planning horizon annual cash flows may well differ from the figure of £1,250 due to additional investment in fixed and working capital items but this will make no difference to present *value* as any new investment made (when discounted) will be the same as the discounted value of the future cash inflows from that investment. In other words, the company is able to earn merely the required rate of return from Year 8 onwards so no new investment can create value. For example, suppose that Gold raised additional funds of £1,000 and at the end of Year 9 invested this in a project generating a perpetual annual net cash inflow of £120 starting at time 10. When these figures are discounted to time 0 the NPV is zero:

Present value of cash outflow	$\frac{£1,000}{(1.12)^9} = -360.61$
Present value of cash inflows	$\frac{£120/0.12}{(1.12)^9} = +360.61$

Thus incremental investment beyond the planning horizon generates no incremental value and so can be ignored for value calculations.



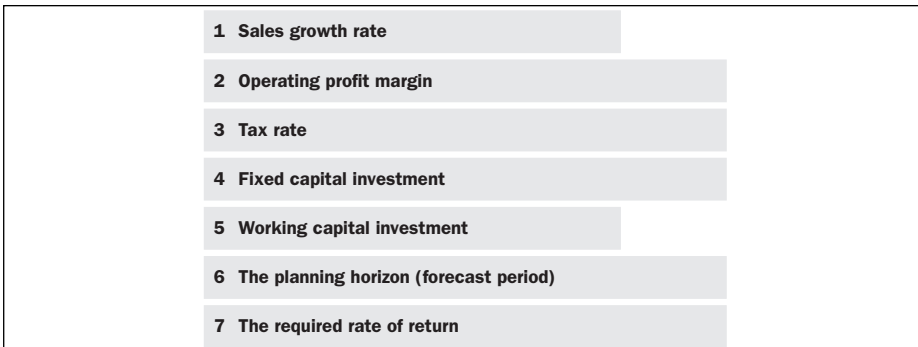
## The connection with stock market valuation

The kind of discounted cash flow analysis illustrated in Table 8.1 is used by financial institutions to value shares. (In these cases interest paid to lenders is subtracted to determine the cash flow attributable to shareholders which is then discounted at the required return for shares of that risk class – not a weighted average cost of capital including the return to debt holders – see Chapter 13.) Given the emphasis by the owners of the firm on cash flow generation it would make sense for managers when evaluating strategies, projects, product lines and customers to use a similar method.

## Shareholder value analysis

Alfred Rappaport (1998) has taken the basic concept of cash flow discounting and developed a simplified method of analysis. In the example of Gold plc (*see* Table 8.1) the component elements of the cash flow did not change in a regular pattern. For example, fixed capital investment was ten times as great in Year 2 as in Year 5. Rappaport's shareholder value analysis assumes relatively smooth change in the various cash flow elements from one year to the next as they are all taken to be related to the sales level. Rappaport's seven key factors which determine value are as set out in Figure 8.1.

**FIGURE 8.1**  
Rappaport's value drivers



Rappaport calls the seven key factors value drivers, and this can be confusing given that other writers describe a value driver as a factor that enables some degree of competitive advantage. To distinguish the two types of value driver the quantitative seven listed in Figure 8.1 will be referred to as Rappaport's value drivers. To estimate future cash flows Rappaport assumes a constant percentage rate of growth in sales. The operating profit margin is a constant percentage of sales. Profit here is defined as profit before deduction of interest

and tax, PBIT. The tax rate is a constant percentage of the operating profit. Fixed capital and working capital investment are related to the *increase* in sales.

So, if sales for the most recent year amount to £1m and are rising by 12 percent per year, the operating profit margin on sales<sup>2</sup> is 9 percent, taxes are 31 percent of operating profit, the incremental investment in fixed capital items is 14 percent of the *change* in sales, and the incremental working capital investment is 10 percent of the *change* in sales, the cash flow for the next year will be as set out in Table 8.2.

**TABLE 8.2****Silver plc: sales, operating profit and cash outflows for next year**

<hr/>		
<i>Sales in year 1</i>		
= Sales in prior year × (1 + Sales growth rate)	= 1,000,000 × 1.12	
		<u>1,120,000</u>
 <i>Operating profit</i>		
= Sales × Operating profit margin	= 1,120,000 × 0.09	
		100,800
 <i>Taxes</i>		
= Operating profit × 31%	= 100,800 × 0.31	
		-31,248
 <i>Incremental investment in fixed capital</i>		
= Increase in sales × Incremental fixed capital investment rate	= 120,000 × 0.14	
		-16,800
 <i>Incremental investment in working capital</i>		
= Increase in sales × Working capital investment rate	= 120,000 × 0.10	
		<u>-12,000</u>
<b>Operating free cash flow</b>		<b>£40,752</b>
<hr/>		

**Using shareholder value analysis to value an entire company**

Corporate value is the combined value of the debt portion and equity portion of the overall capital structure:

$$\text{Corporate value} = \text{Debt} + \text{Shareholder value}$$

The debt element is the market value of debt, such as long-term loans and overdrafts, plus the market value of quasi-debt liabilities, such as preference shares. In practical shareholder value analysis the balance sheet book value of debt is often used as a reasonable approximation to the market value. The above equation can be rearranged to derive shareholder value:

$$\text{Shareholder value} = \text{Corporate value} - \text{Debt}$$

Rappaport’s corporate value has three elements, due to his separation of the discounted cash flow value of marketable securities – these are assets not needed in operations to generate the business’s cash flows – from the cash flows from operations (*see* Figure 8.2). The value of the marketable securities is expressed as their current market price.

**FIGURE 8.2**  
Rappaport’s corporate value

Corporate value	=	Present value of operating cash flows within the planning horizon ('forecast period')	+	Present value of operating cash flows after the planning horizon	+	The current value of marketable securities and other non-operating investments, e.g. government bonds
-----------------	---	---	---	--	---	---

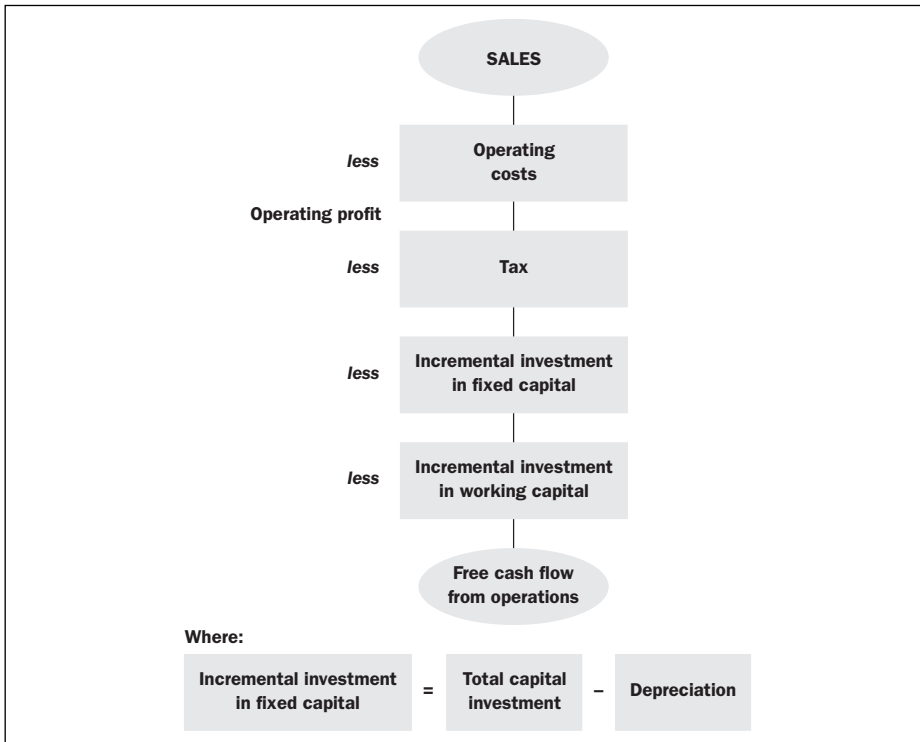
**Free cash flow** is the operating cash flow after fixed and working capital investment; that which comes from the *operations* of the business. It excludes cash flows arising from, say, the sale of shares by the company or bond issue. It also excludes payments of interest or dividends (*see* Figure 8.3).

**A closer look at depreciation and investment in fixed capital**

Investment in plant, machinery, vehicles, buildings, etc. consists of two parts.

- *Type 1.* Annual investment to replace worn-out equipment and so on, leaving the overall level of assets constant.
- *Type 2.* Investment that adds to the stock of assets, presumably with the intention of permitting growth in productive capacity. This is called incremental fixed-capital investment.

A simplifying assumption often employed in shareholder value analysis is that the ‘depreciation’ figure in the profit and loss account is equal to the Type 1 investment. This avoids the necessity of first adding back depreciation to operating profit figures and then deducting Type 1 capital investment. It is only necessary to account for that extra cash outflow associated with incremental fixed capital investment. Free cash flow therefore is as defined in Figure 8.3.

**FIGURE 8.3****Rappaport's free cash flow****Illustration**

We can calculate the shareholder value of Silver plc by using Rappaport's seven value drivers if we assume a planning horizon of eight years and a required rate of return of 15 percent (*see* Tables 8.3 and 8.4).

**TABLE 8.3****Rappaport's value drivers applied to Silver plc**

1	Sales growth	12% per year
2	Operating profit margin	9% of sales
3	Taxes	31% of operating profit
4	Incremental fixed capital investment	14% of the change in sales
5	Incremental working capital investment	10% of the change in sales
6	The planning horizon (forecast period)	8 years
7	The required rate of return	15% per year

The company also has £60,000 of investments in foreign and domestic shares and £50,000 in long-term fixed interest rate securities. These are assets not required to produce operating profit and can be sold off with the proceeds given to their owners, i.e. the shareholders.

**TABLE 8.4****An example of shareholder value analysis – cash flow calculation**

Year	0	1	2	3	4	5	6	7	8	9 and sub- sequent years
£000s										
Sales	1,000	1,120	1,254	1,405	1,574	1,762	1,974	2,210	2,476	2,476
Operating profits		101	113	126	142	159	178	199	223	223
Less taxes		-31	-35	-39	-44	-49	-55	-62	-69	-69
Less incremental investment in fixed capital		-17	-19	-21	-24	-26	-30	-33	-37	0
Less incremental working capital investment		-12	-13	-15	-17	-19	-21	-24	-27	0
Operating free cash flow		41	46	51	57	65	72	80	90	154

*Note:* All figures are rounded to whole numbers. There is no additional investment in fixed assets and working capital after year 8 shown. This indicates that the perpetual cash flow of 154 can be produced without expanding the physical capacity of the firm (no new factories, etc.). However, investment in the form of replacement of existing facilities subject to wear and tear is taking place, equal to the depreciation amount deducted before the figure for operating profits is input to the analysis. Investment above and beyond this replacement investment may take place, but it has no impact on the value calculation because investment after the planning horizon generates a return equal to the required rate of return, i.e. there is no performance spread for these assets, and so such investment is ignored for the calculation of firm value.

Corporate value is as set out in Figure 8.4.

The required rate of return in shareholder value analysis is the weighted average required return on debt and equity capital which allows for a return demanded by the debt holders and shareholders in proportion to their provision of capital (see Chapter 10). This explains why cash flows before deduction of interest are discounted rather than just those attributable to shareholders: some of those cash flows will go to debt holders. The discounted cash flows derived in this way are then summed to give the corporate value (sometimes called enterprise value). When debt, in this case, £200,000, is deducted, shareholder value is obtained.

**FIGURE 8.4**  
**Corporate value**

<b>Present value of operating cash flows within the planning horizon (forecast period)</b>	$\frac{41}{1.15} + \frac{46}{(1.15)^2} + \frac{51}{(1.15)^3} + \frac{57}{(1.15)^4}$ $+ \frac{65}{(1.15)^5} + \frac{72}{(1.15)^6} + \frac{80}{(1.15)^7} + \frac{90}{(1.15)^8}$	= 259
+		
<b>Present value of operating cash flows after the planning horizon</b>	$\frac{154}{0.15} = 1,027$	
	then discount result by eight years	
		$\frac{1,027}{(1.15)^8} = 336$
+		
<b>The current value of marketable securities and other non-operating investments</b>	$60+50$	= 110
<b>CORPORATE VALUE</b>		<b>705</b> <b>or £705,000</b>

$$\text{Shareholder value} = \text{Corporate value} - \text{Debt}$$

$$\text{Shareholder value} = \text{£}705,000 - \text{£}200,000 = \text{£}505,000$$

Again, this kind of analysis can be used at a number of different levels:

- whole business
- division/SBU
- operating unit
- project
- product line or customer.

### Strategy valuation using shareholder value analysis

The quantitative evaluation of alternative strategies in terms of value creation can assist strategic choice. It is advisable when applying shareholder value analysis to a business unit or corporate level strategy formulation and evaluation to consider at least four alternative strategic moves:

- a continuation of current strategy – ‘base-case’ strategy;
- liquidation;
- trade sale (selling the entire business to another firm) or spin-off (selling a business unit, while perhaps retaining a stake);
- new operating strategy.

Imagine that the company we have been using to explain shareholder value analysis is involved in the production of plastic guttering for houses and the shareholder value figure of £505,000 represents the base-case strategy, consisting of relatively low levels of incremental investment and sales growing at a slow rate.

### Alternatives

- The company has recently been approached by a property developer interested in purchasing the company's depot and offices for the sum of £400,000. Other assets (vehicles, inventory, machinery) could be sold to raise a further £220,000 and the marketable securities could be sold for £110,000. This liquidation would result in shareholders receiving £530,000 ( $£400,000 + £220,000 + £110,000 - £200,000$ ). This liquidation option produces slightly more than the base-case strategy.
- The third possibility is a trade sale or spin-off. Companies can sell separable businesses to other firms or float off strategic business units or groups of SBUs on the stock market. Kingfisher split itself in 2003 into a DIY company (B&Q etc.) and an electrical retailing company (Kesa, with Comet, Darty and BUT etc.), each with a separate quotation. In the case of the fictional guttering firm, it is too small to obtain a separate quotation for component parts, and its operations are too well integrated to allow a trade sale of particular sections. However, in the past shareholders have been approached by larger competitors to discuss the possibility of a takeover. The three or four major industry players are trying to build up market share with the stated aim of achieving 'economies of scale and critical mass' and there is the distinct impression that they are being over-generous to selling shareholders in smaller firms – they are paying 'silly prices'. The management judge that if they could get a bidding war going between these domineering larger firms they could achieve a price of about £650,000 for shareholders.
- The fourth possibility involves an expansion into a new product area of multi-colored guttering. This will require large-scale investment but should result in rapidly rising sales and higher operating margins. The expected Rappaport value drivers are as set out in Table 8.5. Note the increased investment in capital items. Also note the higher risk of this strategy compared with the base-case is reflected in the increased discount rate from 15 to 16 percent.

**TABLE 8.5**

**Rappaport's value drivers applied to an expansion of Silver plc**

1	Sales growth	25% per year
2	Operating profit margin	11% of sales
3	Taxes	31% of operating profit
4	Incremental fixed capital investment	15% of the change in sales
5	Incremental working capital investment	10% of the change in sales
6	The planning horizon (forecast period)	8 years
7	The required rate of return	16% per year

The guttering firm's shareholder value under the new strategy is as set out in Table 8.6. This shows that there are lower cash flows in the first three years with this strategy compared with the base-case strategy because of the increased investment, yet the overall expected shareholder value rises from £505,000 to £1,069,000.

**TABLE 8.6**  
**The guttering firm's shareholder value under the new strategy**

Year	0	1	2	3	4	5	6	7	8	9 and sub- sequent years
£000s										
Sales	1,000	1,250	1,563	1,953	2,441	3,052	3,815	4,768	5,960	5,960
Operating profits		138	172	215	269	336	420	524	656	656
Less taxes		-43	-53	-67	-84	-104	-130	-162	-203	-203
Less incremental investment in fixed capital		-38	-47	-59	-73	-92	-114	-143	-179	0
Less incremental working capital investment		-25	-31	-39	-49	-61	-76	-95	-119	0
Operating free cash flow		32	41	50	63	79	100	124	155	453
Discounted cash flows within planning horizon		$\frac{32}{1.16} + \frac{41}{(1.16)^2} + \frac{50}{(1.16)^3} + \frac{63}{(1.16)^4} + \frac{79}{(1.16)^5} + \frac{100}{(1.16)^6} + \frac{124}{(1.16)^7} + \frac{155}{(1.16)^8} = 295$								
Discounted cash flow beyond planning horizon		$453/0.16 = 2,831$ , then $2,831/(1.16)^8 = 864$								
Marketable securities		$= 110$								
Corporate value		<b>1,269</b>								
Shareholder value = Corporate value – Debt		$= £1,269,000 - £200,000$								
		$= £1,069,000$								



**Sensitivity and scenario analysis**

(These comments apply to cash flow analysis as well.)

To make a more informed choice the directors may wish to carry out a sensitivity and scenario analysis (see Chapter 5 for an introduction to this technique). A worst-case and a best-case scenario could be constructed and the sensitivity to changes in certain variables could be scrutinized. For example, alternative discount rates and incremental investment in fixed capital rates could be examined for the multi-colored product strategy as shown in Table 8.7.

One observation that may be made from Table 8.7 is that even if the amount of incremental capital investment required rises to 20 percent of the increase in sales and the discount rate moves to 17 percent this strategy produces the highest value of all the four options considered. The management team may wish to consider the consequences and the likelihood of other variables changing from the original expected levels.

**TABLE 8.7**  
**Shareholder value for the guttering firm under different discount and capital investment rates**

£000s		Discount rate		
		15%	16%	17%
Incremental fixed capital investment rates	15%	1,205	1,069	951
	20%	1,086	955	843

**Targets, rewards and alignment of managerial effort**

Following an initial shareholder value analysis it can be useful to breakdown each of the seven Rappaport value drivers into more detail. So, for example, if the operating profit margin is 20 percent you could investigate what proportion of the 80 percent of income from sales flows out in the form of wages, or material costs, or overheads, etc. This will permit focus of managerial attention. It also allows performance measures and targets to be more detailed. The production manager can be set targets in terms of raw material wastage and shop floor employee efficiency. These operating targets can then be fed into the goal to improve the operating margin and the ultimate goal of shareholder wealth maximization. Similarly, managers with responsibility for fixed and working capital investment can agree targets that are aligned with all the other managers in terms of being focussed on value.

Another use of this analytical method: The value drivers (and their component parts) can be used to benchmark the company against competitors. So, if you find that your firm has the highest level of work-in-progress inventory per unit of sales you may want to see if there are efficiency gains to be made.

## Problems with shareholder value analysis

There are some disadvantages to the use of shareholder value analysis.

- Constant percentage increases in value drivers lack realism in some circumstances, in others it is a reasonable simplification.
- It can be misused in target setting, for example if managers are given a specific cash flow objective for a 12-month period they may be dissuaded from necessary value-enhancing investment (i.e. using cash) to achieve the short-term cash flow target. Alleviate this problem by setting both short- and long-term targets. The short-term ones may show negative cash flows.
- Data availability – many firms' accounting systems are not equipped to provide the necessary input data. The installation of a new cash flow orientated system may be costly.

## Economic profit

---

Economic profit, EP (also called residual income) has an advantage over shareholder value analysis because it uses the existing accounting and reporting systems of firms by focussing on profit rather than cash flow information. This not only reduces the need to implement an overhaul of the data collecting and reporting procedures but also provides evaluatory and performance measurement tools which use the familiar concept of profit. Managers used to 'bottom line' figures are more likely to understand and accept this metric than one based on cash flow information.

Economic profit for a period is the amount earned by a business after deducting all operating expenses and a charge for the opportunity cost of the capital<sup>3</sup> employed.

A business only produces an economic profit if it generates a return greater than that demanded by the finance providers given the risk class of investment. There are two versions of economic profit.

### The entity approach to EP

One version of EP is based on profit after tax is deducted but before interest is deducted.<sup>4</sup> There are two ways to calculate this EP.

**The profit less capital charge method**

Here a charge for the use of capital equal to the invested capital multiplied by the return required by the share and debt holders (which is a weighted average cost of the debt and the equity, WACC) is deducted from the operating profits after tax:

Economic profit (entity approach)	=	Operating profit before interest deduction and after tax deduction	-	Capital charge
--------------------------------------	---	--	---	----------------

Economic profit (entity approach)	=	Operating profit before interest deduction and after tax deduction	-	Invested capital × WACC
--------------------------------------	---	--	---	----------------------------

**The ‘performance spread’ method**

The difference between the return achieved on invested capital and the weighted average cost of capital (WACC), i.e. the required rate of return, is the performance spread. This percentage figure is then multiplied by the quantity of invested capital to obtain EP:

Economic profit (entity approach)	=	Performance spread	×	Invested capital
--------------------------------------	---	--------------------	---	------------------

Economic profit (entity approach)	=	Return on capital – WACC	×	Invested capital
--------------------------------------	---	-----------------------------	---	------------------

The WACC allows for an appropriate risk-adjusted return to each type of finance provider (debt and equity) – see Chapter 10 for a calculation of this. As can be seen from the following Illustration either method leads to the same EP.

### Illustration

EoPs plc has a weighted average cost of capital (required rate of return) of 12% and has used £1m of invested capital (share and debt) to produce an operating profit before interest and after tax of £180,000 during the past year.

*Profit less capital charge:*

$$\begin{aligned} \text{EP} &= \text{Operating profits before interest and after tax} - (\text{Invested capital} \times \text{WACC}) \\ &= £180,000 - (£1,000,000 \times 0.12) \\ &= £60,000 \end{aligned}$$

*Performance spread approach:*

$$\begin{aligned} \text{EP} &= (\text{Return on capital} - \text{WACC}) \times \text{Invested capital} \\ &= (18\% - 12\%) \times £1,000,000 \\ &= £60,000 \end{aligned}$$

### The equity approach to EP

This entity EP approach, based on operating profit before the deduction of interest, calculates the surplus above the return to all the finance providers to the business entity including the debt holders. The alternative is the 'equity approach'. With this interest is deducted from the profit figure so we obtain the profit that belongs to the shareholders. Also the required return is the return demanded on the equity capital only. So, EP is the profit attributable to shareholders' after a deduction for the implicit cost of employing shareholders' capital.

$$\begin{array}{l} \boxed{\text{Economic profit (equity approach)}} = \boxed{\text{Operating profit after deduction of interest and tax}} - \boxed{\text{Invested equity capital}} \times \boxed{\text{Required return on equity}} \\ \boxed{\text{Economic profit (equity approach)}} = \boxed{\text{Return on equity} - \text{Required return on equity}} \times \boxed{\text{Invested equity capital}} \end{array}$$

### Illustration

In the case of EoPs let us assume that one-half the £1m of capital is equity and the other half debt. The equity required rate of return is 15% and the debt required rate of return is 9% (i.e. £45,000 per year), therefore the weighted average cost of capital is 12%.

*Profit less capital charge:*

Deducting £45,000 of interest from the operating profit figure we have £135,000.

$$\begin{aligned} \text{EP (equity)} &= \text{Operating profits after interest and tax} - (\text{Invested equity} \\ &\quad \text{capital} \times \text{Required return on equity}) \\ &= £135,000 - (£500,000 \times 0.15) \\ &= £60,000 \end{aligned}$$

*Performance spread approach:*

$$\begin{aligned} \text{EP (equity)} &= (\text{Return on equity} - \text{Required return on equity}) \times \\ &\quad \text{Invested equity capital} \\ &= (27\% - 15\%) \times £500,000 \\ &= £60,000 \end{aligned}$$

The return on equity<sup>5</sup> is 27% (£135,000/£500,000).

### A short history of economic profit

The principles behind economic profit have a long antecedence. For at least a century economists have been aware of the need to recognize the minimum return to be provided to the finance provider as a 'cost' of operating a business. Enlightened chief executives have for decades, if not centuries, taken account of the amount of capital used by divisional managers when setting targets and measuring performance, with some sort of implicit, or explicit, cost being applied. David Solomons (1965) formalized the switch from return on capital employed (ROCE) and other accounting rates of return measures to 'the excess of net earnings over the cost of capital as the measure of managerial success'. But even he drew on practical innovation that had taken place in a number of large US companies.

### The use of economic profit is becoming more widespread

For over a decade major US firms, including Walt Disney, Quaker Oats and AT&T, have been switching to using economic profit as a guiding concept. The focus of economic profit on the productive use of capital can have profound consequences. Roberto Goizueta, CEO of Coca-Cola, put the basic philosophy this way: 'We raise capital to make concentrate, and sell it at an operating profit. Then we pay the cost of that capital. Shareholders pocket the difference'.\* Barclays Bank adopted the technique in 2000 declaring their aim to double economic profit every four years.† Bass stated that 'any acquisition must clear three hurdles: create value in net present value terms; enhance earnings in year one; and produce returns above the weighted average cost of capital by year three'.\*\*

Sources:\* Quoted in Tully (1993), p. 93. † *The Economist*, London, 18 November 2000.

\*\* *Financial Times*, 8 December 2000.

### Usefulness of economic profit

A focus on EP rather than the traditional accounting profit has the advantage that every manager down the line is encouraged (rewarded) for paying close attention to the cost associated with using capital in a business unit, project, product line or the entire corporation. The introduction of EP targets has resulted in some dramatic reductions in money tied-up wastefully in assets such as raw material stocks, and to significant reductions in requests for major fixed capital expenditure. Managers who are judged on profits may not be as keen to reduce capital employed as those judged on EP.

Economic profit can be used to evaluate strategic options which produce returns over a number of years. For example, Spoe plc is considering the investment of £2m in a new division that is expected to produce a constant operating profit after tax of £300,000 per year to infinity without the need for any further investment in fixed capital or working capital in subsequent years. The company has a required rate of return on capital of 13 percent. The extra value created on top of the initial investment of £2m is:

$$\begin{aligned} \text{Economic profit (entity) per year} &= (\text{Return on capital} - \text{WACC}) \times \\ &\quad \text{Invested capital} \\ &= (15\% - 13\%) \times \text{£}2,000,000 \\ &= \text{£}40,000 \end{aligned}$$

The present value of this perpetuity is:

$$\text{£}40,000/0.13 = \text{£}307,692$$

This £307,692 is the additional value, in present terms, of operational cash flow. To obtain the total value of this division we add to this the initial investment:

$$\begin{aligned} \text{Value of new division} &= \text{Present value of economic profit} + \text{Initial investment} \\ &= \text{£}307,692 + \text{£}2,000,000 = \text{£}2,307,692 \end{aligned}$$

Having expressed the new strategy in terms of EP, in implementing it EP targets can be set annually and rewards granted for achieving (exceeding) those targets.

Economic profit has an advantage over shareholder value analysis in that it can be used to look back at how the firm (unit) has performed relative to the amount of capital used each year as well as creating future targets in terms of EP. (Shareholder value analysis is generally used only in forward-looking mode. Having said that however, once the shareholder value analysis estimates have been made for a strategy it is possible to set interim targets, which, as time passes, are examined for deviation. So, in this sense it can be used in backward looking mode, i.e. within a plan.) With EP it is possible to go to a firm and examine past performance from scratch, without the need for established EP targets within a plan.

Economic profit per unit can be calculated. For example, economic profit per square foot or economic profit per unit of output. Economic profit sends a more powerful signal because it is expressed in absolute amounts of money generated for shareholders above the minimum required, e.g. £1.20 EP per unit sold, rather than a percentage, e.g. profit margin of 14 percent. Profit margins fail to allow for the size of the capital commitment.

### **Difficulties with economic profit**

There are, however, some disadvantages to the use of economic profit.

#### **The balance sheet does not reflect invested capital**

Balance sheets are not designed to provide information on the present economic value of assets being used in a business. Assets are generally recorded at original cost less depreciation, amortization (reduction in intangibles) and depletion (e.g. reduction in oil reserves). With or without inflation it does not take many years for these balance sheet values to deviate dramatically from the theoretically correct capital employed figures for most firms. Generally balance sheets significantly understate the amount of capital employed, and this understatement causes EP to appear high. Moreover, many businesses invest in assets that never find their way to a balance sheet. For example, some firms pour vast sums into building up brand images and do so with the, often correct, belief that shareholders' money is being well invested, with the pay-off arising years later. Nevertheless, accounting convention insists on such expenditures being written off against profits rather than being taken into the balance sheet. The same problem applies to other 'investments' such as business reputation and management training. The early theorists in value measurement suggested using current values of assets. Following them I would be tempted in certain circumstances to use the either (a) the sum of the resale value of individual assets, or (b) replacement cost. Much depends on the objective of the analysis:

- If the objective is to monitor past performance in terms of examining the efficiency with which money was invested the historic amount invested seems somewhat relevant as the ‘capital’ figure. However, there will be many circumstances where a distinctly unsatisfactory capital figure is derived from a balance sheet, e.g. when assets were acquired decades before the current period.
- If you are monitoring current (this year) performance perhaps the current replacement value or the sum of the resale value of individual assets may be most useful. (Sometimes the resale value is very low when the assets are highly specific with little secondary market, so relying on the resale value alone would give an artificially low asset value. In other circumstances the replacement value is clearly way above the level that any manager would actually replace at and so a more informed decision can be made by using resale value as it represents the opportunity cost of using the assets this year.)
- If the asset value is needed to make future oriented decisions about where to invest assets presently owned by the firm then the sum of the resale value of the individual assets would be most useful because this would capture the opportunity cost – the firm could sell off these assets as an alternative. The sunk costs associated with past investment are not relevant in such a decision and so balance sheet values are not very useful.
- If the decision concerns the obtaining of new assets to implement a project/strategy then the cost of obtaining them is relevant.

Note that we use the ‘sum of the resale value of individual assets’ rather than the current market value of all-the-assets-when-welded-together-as-a-coherent-whole for the corporation/SBU because to use the latter would eliminate any value by definition. For example, if a firm starts up with £1m of capital and a brilliant idea, immediately the strategy is put in place to exploit the idea the resale value of the firm as an operating entity rises to, say, £10m. That is, the resale value of the firm is equal to the initial capital plus the present value of the future cash flows or EP. The £10m current market value of all-the-assets-when-welded-together-as-a-coherent-whole includes £9m of value, but the value of the sum of the individual assets is in the region of £1m.

### **Manipulation and arbitrariness**

The difficulties caused by relying on accounting data are exacerbated by the freedom available to manipulate such figures as well as the degree of subjectivity involved in arriving at some of the figures in the first place. For example, if a business has sold goods on credit some customers are likely to fail to pay on the due date. The problem for the accountant (and managers) is to decide when to accept that particular debts will never be paid; is it after three months, six months or a year? Until they are declared ‘bad debts’ they are recorded as an asset – perhaps they will turn out to be worth something, perhaps they won’t. At each balance sheet date judgment is required to establish an estimate of the value of the debtor balance to the firm. Similar problems of ‘flexibility’ and



potential for manipulation are possible with the estimate of the length of life of an asset (which has an effect on annual depreciation), and with R&D expenditure or inventory valuation.

Having a wide range of choice of treatment of key inputs to the profit and loss account and balance sheets makes comparability over time, and between companies, very difficult.

### **High economic profit and negative NPV can go together**

There is a danger of over-reliance on EP. For example, imagine a firm has become a convert to economic profit and divisional managers are judged on annual economic profit. Their bonuses and promotion prospects rest on good performance spreads over the next 12 months. This may prompt a manager to accept a project with an impressive EP over the short term whether or not it has a positive NPV over its entire life. Projects that produce poor or negative EPs in the first few years, for example biotechnology investments, will be rejected even if they will enhance shareholder wealth in the long term.

Also, during the life of a project, managers may be given specific EP targets for a particular year. They may be tempted to ensure the profit target is met by cutting down on certain expenditures such as training, marketing and maintenance. The target will be achieved but long-term damage may be inflicted.

A third value-destroying use of EP occurs when managers are demotivated by being set EP targets. For example, if managers have no control over the capital employed in their part of the business, they may become resentful and cynical of value-based management if they are told nevertheless to achieve certain EP targets.

Care must be taken by external observers when examining the EP (or EVA) to judge performance, particularly in annual league tables. Misleading impressions are frequent over periods as short as one year because some firms that are on a high value creating path often have years where EP is low (or nil). Then there are firms on a value destructive path which report high current year EP. You can only judge performance over a number of years. When EP is used internally, however, it frequently does make sense to produce annual (or even six-monthly) EP figures to compare with a plan to see if the value creation strategy is on target. Within the plan there will probably be periods of negative EP (e.g. in the start-up phase), as well as periods of high surpluses over the cost of capital.

### **Difficult to allocate revenues, costs and capital to business units, products, etc.**

To carry out EP analysis at the sub-firm level it is necessary to measure profit and capital invested separately for each area of the business. Many costs and capital assets are shared between business units, product lines and customers. It is very difficult in some situations to identify the proportion of the cost, debt or asset that is attributable to each activity. It can also be expensive. Consultants tend to be overoptimistic about the ability of accountants and managers to do this in a theory-compliant and precise manner.

## Economic value added (EVA®)

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EVA, developed and trademarked by the US consultants Stern Stewart and Co., is a variant of EP that attempts to overcome some of the problems outlined above. Great energy has been put into its marketing and it is probably the most widely talked about value metric.

$$\text{EVA} = \text{Adjusted invested capital} \times (\text{Adjusted return on capital} - \text{WACC})$$

or

$$\text{EVA} = \text{Adjusted operating profits after tax} - (\text{Adjusted invested capital} \times \text{WACC})$$

The adjustments to profit and capital figures are meant to refine the basic EP. Stern Stewart suggest that up to 164 adjustments to the accounting data may be needed. For example, spending on marketing and R&D helps build value and so these are added back to the balance sheet as assets (and amortized over the period expected to benefit from these expenditures). Goodwill on acquisitions previously written off is also returned and is expressed as an asset, thus boosting both profits and the balance sheet.

There are a number of difficulties with these adjustments – for example, over what period should these reconstituted ‘assets’ be amortized? Should you make adjustments for events up to five years ago, ten years ago, or the whole life of the firm?

EVA, like the generic EP, has the virtue of being based on familiar accounting concepts and it is arguably more accurate than taking ordinary accounting figures. However, critics have pointed out that the adjustments can be time-consuming and costly, and many are based on decisions that are as subjective as the original accountant’s numbers. There also remains the problem of poorly, if enthusiastically, implemented EVA reward systems producing results that satisfy targets for EVA but which produce poor decisions with regard to NPV. Furthermore, the problem of allocating revenue, costs and capital to particular business units and products is not solved through the use of EVA.

Despite the outstanding problems companies are seeing benefits from introducing EVA.

It’s not rocket science, but it is good lingua franca that does indeed get everyone back to basics, makes them understand better the cash consequences of their own actions and, further, makes them address other departments’ problems, not just their own. Within each of our businesses we don’t incentivise, for example, the sales director on sales and we don’t incentivise the finance director on cash generation. The whole management team is incentivised on EVA and that means they are all pulling in the same direction and have to liaise better. (Mike Ashton, Finance Director of BWI).<sup>6</sup>

At Burtons, the UK clothing retailer (now Arcadia), Martin Clifford-King said:

We see it [EVA] as an operational tool. In the past, stores used to be targeted on sales, then we moved to profit, and EVA is a further refinement of this approach, taking into account the cost of capital tied up in the business.<sup>7</sup>

The use of EVA is spreading around the world. Sony, in Japan, has invited Stern Stewart to work with the company. In Germany Volkswagen has attempted to align managerial interests with those of shareholders by making up to 40 per cent of their annual bonuses dependent on achieving EVA targets – see Exhibit 8.1 (excuse the mistake in the article on the meaning of ‘E’).

## VW to alter management focus

By James Mackintosh, Motor Industry Editor, in Wolfsburg

Volkswagen, Europe’s largest manufacturer of motor vehicles, is shaking up executive pay in an attempt to make managers more cautious about investment and increase loyalty to the group rather than the seven individual brands.

VW will base up to 40 per cent of this year’s bonus on returns above the cost of capital, a big step in an industry renowned for destroying capital.

The move to earnings value added (EVA) measures to determine pay is part of an attempt by Bernd Pischetsrieder, chief executive, and Hans Dieter Pötsch, incoming finance director, to make managers think harder before making investments.

The group has abandoned return on sales targets in favour of measuring return on invested capital and is clamping down on investment and research and development spending, seen as out of control. ...

In addition to EVA, the bonus structure adds group performance measures

to the individual and brand measures already used in an attempt to make the brands work with each other, rather than competing. ...

Last year VW made a return on invested capital of 7.4 per cent, below its 7.7 per cent cost on capital – equivalent to destroying €134m (\$164m) of value. It paid an average bonus of €1.31m last year to the nine managers and board members.

To start with directors will have only 40 per cent of bonuses determined by EVA measures, a similar level to more junior managers. Base salary is unaffected. But Mr. Pötsch said: ‘Eventually a substantial part of payments will be based on EVA.’

Investment was already expected to fall, with more than €3bn cut from capital spending, 10 per cent of the 2002 five-year plan. Mr Pötsch said ‘a similar amount’ could be saved from the R&D budget.

### EXHIBIT 8.1 VW to alter management focus

Source: *Financial Times* 1 September 2003

## Cash flow return on investment (CFROI)

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The CFROI approach is a more complicated version of the internal rate of return (IRR) method employed in Chapter 2. There it was used for investment projects, CFROI expands the principle to a larger scale, even to the entire firm. To calculate the CFROI for a strategic business unit you would need to obtain the amount of capital (including debt) currently devoted to it and then estimate the operating cash flows. After a few complicating adjustments you calculate the rate of return that causes cash outflows (including initial capital value) to equal cash inflows to arrive at the CFROI.

The promoters of this approach recommend that assets in the balance sheet be restated to their current price equivalent value to achieve a proper estimate of the sacrifice finance providers to the company are making in the SBU (or product line, or entire company). For example, accumulated depreciation is added back to the balance sheet value for fixed assets. Inventory values and fixed asset values may be raised by the amount of inflation since purchase to be at 'current prices'. Goodwill from acquired companies previously written off is added back. The value of future lease obligations are also added back.

CFROI suffers from the same problems of IRR such as the tendency to favour projects with a high percentage gain over those with a high absolute gain in shareholder wealth – see Chapter 2.

There is a degree of imprecision and arbitrariness in adding back depreciation and making an inflation adjustment, e.g. are the assets the firm is using five or 20 years old?

It is also a relatively complicated method to use, particularly in circumstances where assets and costs are shared between SBUs, projects or product lines.

## Conclusion

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This chapter has described a number of value-based metrics used to guide organizations. This is field dominated by consultancy organizations each with a particular approach to sell. The foundation for all of them is discounted cash flow allowing for a suitable return on the money shareholders contribute to the business. I suggest that, rather than selecting one internal value metric, a better approach, for both strategic investment discussion and performance targeting and measurement, is to set both cash flow and economic profit targets. This would counter a number of problems of using each separately and would help to alleviate the tendency of managers to take action to achieve particular short-term targets at the expense of long-term wealth.

## Notes

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- 1 Discussed in Chapter 6.
- 2 Operating profit margin on sales is sales revenue *less* cost of sales and all selling and administrative expenses before deduction of tax and interest.
- 3 The meaning of the word 'capital' used here is different from its meaning in accounting. 'Capital' in accounting is a part of the shareholders' equity of the company ('capital issued', 'paid-in capital', etc.). 'Capital' in the present context means the sum of shareholders' equity (and of the borrowings of the company in the first version of EP).
- 4 There are a few technical complications ignored here, but this is the essence of EP. For more detail consult McTaggart *et al.* (1994) or Stewart (1991).
- 5 The entity EP and the equity EP give the same annual EP figures but can give different equity values if calculated with a WACC determined by the initial proportions of debt and equity (i.e. those amounts put into the business by shareholders and debt holders). This is apparent in the following illustration (to be read after absorbing the fundamentals of WACC in Chapter 10). Valucrazee plc is set up with £50m from shareholders and £50m of debt capital. Equity at this risk level requires a rate of return of 20 percent, while debt requires 10 percent, therefore the WACC (based on initial proportions of debt and equity) = 15 percent. The company is expected to produce cash flow available for all the finance providers (i.e. before deduction of interest but after tax) of £25m per year to infinity.

*Value under the entity approach:*

$$\begin{array}{lcl} \text{Annual EP} & = & \text{Profit after tax before interest} - \text{Capital} \times \text{Required rate of return} \\ \text{Annual EP} & = & \text{£25m} \qquad \qquad \qquad - (\text{£100m} \times 15\%) \qquad \qquad = \text{£10m} \end{array}$$

$$\begin{array}{lcl} \text{Corporate value} & = & \text{Initial total capital} + \text{Present value of annual economic profit} \\ \text{Corporate value} & = & \text{£100m} \qquad \qquad \qquad + \text{£10m}/0.15 \qquad \qquad \qquad = \text{£166.67m} \end{array}$$

$$\text{Equity value} = \text{Corporate value} - \text{debt value} = \text{£166.67m} - \text{£50m} = \text{£116.67m}$$

*Value under the equity approach:*

$$\begin{array}{lcl} \text{Annual EP} & = & \text{Profit after tax and interest} - \text{Equity capital} \times \text{Required rate} \\ & & \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \text{of return} \end{array}$$

$$\text{Annual EP} = (\text{£25m} - \text{£5m}) \qquad \qquad \qquad - (\text{£50m} \times 20\%) \qquad \qquad \qquad = \text{£10m}$$

$$\text{Equity value} = \text{Initial equity} + \text{Present value of annual equity economic profit}$$

$$\text{Equity value} = \text{£50m} + \text{£10m}/0.20 \qquad \qquad \qquad = \text{£100m}$$

The reason for the £16.67m difference is that the surplus cash flow above the minimum required is discounted at different rates. In the first case the £10m surplus cash flow (which must all be attributable to shareholders as the debt holders are satisfied with the 'required rate of return' deduction) is discounted at 15 percent, whereas in the second case it is discounted at 20 percent.

To make the two equity values equal we need to follow the rule when calculating WACC of using market value weights for debt and equity (i.e. what the total value of the shares in the company are after going ahead) rather than original book (balance sheet) values. The market value of debt remains the same if a value-enhancing project is accepted – that is, £50m. However, the market value of the equity is significantly higher than the amount first put in by the shareholders.

The annual cash flow to equity of £20m when discounted at 20 percent is £100m. Therefore, the weights used to calculate the WACC are:

Debt	£50m	Weight: £50m/£150m = 0.333
Equity	£100m	Weight: £100m/£150m = 0.667
Total capital	£150m	

$$\text{WACC} = K_e W_E + K_D W_D = 0.2 \times 0.667 + 0.1 \times 0.333 = 16.67\%$$

This changes the valuation under the entity approach:

Annual EP	=	Profit after tax before interest	–	Capital × Required rate of return
Annual EP	=	£25m	–	(£100m × 16.67%) = £8.33m

Corporate value = Initial total capital + Present value of annual economic profit

$$\text{Corporate value} = £100\text{m} + £8.33\text{m}/0.1667 = £150\text{m}$$

Equity value = Corporate value – debt value = £150m – £50m = £100m (the same as under the equity approach)

Under the WACC-adjusted-for-market-value-of-equity approach we observe a fall in the annual EP when using the entity approach from £10m to £8.33m because we, correctly, require 20 percent return on two-thirds (£100m) of capital employed out of a total of £150m (at market values).

What is the practical manager to do? In theory you should be using the market value proportions of debt and equity that are optimal for your firm for all projects, SBUs and for valuing the entire firm. That is, the firm should have target levels of debt relative to the equity base that produces the lowest WACC (see Chapter 10).

The reality in most firms is that the optimum mix of debt and equity is unlikely to be known with any precision as the factors determining the optimum are, at base, can only be quantified through subjective probability estimates, e.g. the chance of financial distress (see Chapter 18). So, it is reasonable to think of the optimum proportions of debt and equity as a range rather than a pin-point percentage. For most firms the reasonable range is quite large. It could easily run from 50:50 gearing to 33:66 gearing. The advice to think in terms of a range for the WACC is reinforced by the many difficulties in other inputs to the WACC calculation, from the cost of equity (what is the risk premium? Is beta the appropriate adjustment for risk?) to the risk free rate of return – see Chapter 10.

Given the complications with the WACC under the entity approach many analysts would simply plump for the equity approach in the first place.

6 Quoted in *Management Today*, January 1997, p. 45.

7 *Ibid.*



# ENTIRE FIRM VALUE MEASUREMENT

Introduction

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Total shareholder return

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Wealth Added Index

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Market Value Added

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Market to Book Ratio

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Conclusion

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## Introduction

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This chapter describes four ‘market-based’ measures of value performance. The feature common to all these measures is the focus on the stock market’s valuation of the company. Total shareholder return (TSR) measures the rise or fall in the capital value of a company’s shares combined with any cash payment, e.g. dividends, received by shareholders over particular periods of time, be it one year, three years or ten years. This gets to the heart of the issue for owners of companies – what return do I get on my shares from the activities of the managers hired to steward the resources entrusted to them?

The Wealth Added Index (WAI<sup>1</sup>) examines the change in share values after allowance for the required rate of return over the period of time examined. The other two metrics, Market Value Added (MVA<sup>2</sup>) and Market to Book Ratio (MBR) also examine the current share price in the market (together with the value of debt). However, rather than track share return performance through time these metrics relate the current market values to the amount of capital put into the business by the share owners (and lenders) since its foundation. If the company’s strategic and operational actions have been robust in the pursuit of shareholder value then the current market value of the equity and debt should be significantly greater than the amount placed in the directors’ hands by the purchasers of shares, through the retention of profits and the lending of debt capital. If, however, the market currently values the shares and the debt at less than the amount put in we know for sure that value has been destroyed.

The observation of a positive difference between current valuation and amount injected may or may not mean value has been generated. This depends on whether the investment made by shareholders and debt holders produced a sufficient *rate* of return given the time period over which the money was held in the stewardship of the directors. So, for example, if a firm founded 15 years ago with £1m of shareholder capital and £1m of debt paid out no dividends and received no more funds from finance providers is now valued at £3.56m for its shares and £1m for its debt we need to know the required rate of return on equity for this risk class given the shareholders’ opportunity cost to judge whether the annual rate of return of around 8.8 percent is sufficient. (Chapter 10 discusses how to calculate required rates of return.)

These four metrics can only be used for ‘entire firm’ assessments for a select group of companies – those with a stock market price quote (around 2000 UK companies). Also note that these metrics cannot be used for analysis of parts of the business, such as a strategic business unit, due to the absence of a share price for a section of a company.

The metrics discussed in the previous chapter, on the other hand, can be used both for disaggregated analysis and for the entire firm. So it makes sense to think in terms of there being at least eight whole-firm value metrics available. These should not be thought of as mutually exclusive but complementary if calculated and viewed with sufficient informed thought.

## Total shareholder return (TSR)

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Shareholders are interested in the total return earned on their investment relative to general inflation, a peer group of firms, and the market as a whole. Total returns includes dividend returns and share price changes over a specified period. For one-period TSR:

$$\text{TSR} = \frac{\text{Dividend per share} + (\text{Share price at end of period} - \text{Initial share price})}{\text{Initial share price}} \times 100$$

Consider a share that rises in price over a period of a year from £1 to £1.10 with a 5p dividend paid at the end of the year. The TSR is 15 percent.

$$\text{TSR} = \frac{d_1 + (P_1 - P_0)}{P_0} \times 100$$

$$\text{TSR} = \frac{0.05 + (1.10 - 1.00)}{1.00} \times 100 = 15\%$$

When dealing with multi-period TSRs we need to account for the dividends received in the interim years as well as the final dividend. The TSR can be expressed either as a total return over the period or as an annualized rate.

So, for example if a share had a beginning price of £1, paid annual dividends at the end of each of the next three years of 9p, 10p and 11p and had a closing price of £1.30, the total return (assuming dividends are reinvested in the company's shares immediately on receipt) is calculated via internal rate of return (see Chapter 2 for an introduction to IRR):

Time	0	1	2	3
Price/cash flow (p)	-100	9	10	11+130

$$-100 + \frac{9}{1+r} + \frac{10}{(1+r)^2} + \frac{141}{(1+r)^3} = 0$$

At:

$$r = 19\%: -1.7037$$

$$r = 18\%: 0.6259$$

$$\text{The internal rate of return} = 18 + \frac{0.6259}{0.6259 + 1.7037} = 18.27\%$$

The annualized TSR is 18.27%.

$$\text{The total shareholder return over the three years} = (1 + 0.1827)^3 - 1 = 65.4\%.$$

TSRs for a number of periods are available from financial data organizations, such as Datastream.

TSR (often referred to simply as 'total return') has become an important indicator of managerial success:

Performance against this type of measure is now used as the basis for calculating the major component of directors' bonuses in over half of FTSE 100 companies . . . TSR reflects the measure of success closest to the hearts of a company's investors: what they have actually gained or lost from investing in one set of executives rather than in another.

(*Management Today*, March 1997, p. 48.)

In Table 9.1 the TSRs of the ten largest UK companies are shown for one year and for five years. Some perform better over one year relative to the others in the group, others perform better over five. The 'dividend yield plus capital gain' metric needs to be used in conjunction with a benchmark to filter out economy-wide or industry-wide factors. So, it would make sense to compare the TSR for HSBC with the TSR for the Banking sector to be able to judge whether a particular performance is due to factors lifting the entire sector or is attributable to good management in the firm.

**TABLE 9.1**

**TSRs for the ten largest UK quoted companies over one year and five years to December 2003**

	TSR 1 year %	TSR 5 years %
Shell T&T	-7	29
BP Amoco	2	17
Vodafone	16	-34
GlaxoSmithKline	15	-34
HSBC	29	90
AstraZeneca	14	3
Royal Bank of Scotland	9	82
HBOS	4	19
Barclays	19	74
Lloyds TSB	-16	-24

Source: Datastream

TSR has taken off as a key performance measure. For example, in 1999 HSBC announced that its 'overall aim is to beat the average total shareholder returns of a peer group of nine leading international financial institutions – such as rival Citigroup – with a minimum objective of doubling shareholder returns over five years'<sup>3</sup> and Ford said it was 'setting a new objective of providing a total shareholder return – dividend plus share price appreciation – in the top quartile of the S&P500 group of companies over time'.<sup>4</sup> In 2000 Pilkington became the first UK company to pay its non-executive directors in shares only, in an attempt to align the management's interests to that of shareholders.

## Thoughtful use of TSR

There are three issues to be borne in mind when making use of TSR:

- *Relate return to risk class* Two firms may have identical TSRs and yet one may be subject to more risk due to the greater volatility of earnings as a result, say, of the economic cycle. The risk differential must be allowed for in any comparison. This may be particularly relevant in the setting of incentive schemes for executives. Managers may be tempted to try to achieve higher TSRs by taking greater risk.
- *Reliance on TSR assumes efficient share pricing* It is difficult to assess the extent to which share return outperformance is due to management quality and how much is due to exaggerated (or pessimistic) expectations of investors at the start and end of the period being measured. If the market is not efficient in pricing shares and is capable of being swayed by irrational optimism and pessimism then TSRs can be an unreliable guide to managerial performance.
- *TSR is dependent on the time period chosen* A TSR over a three-year period can look very different from a TSR measured over a one-year or ten-year period. Consider the annual TSRs for Company W in Table 9.2. Measured over the last two years the TSR of company W is very good. However over five years a £1m investment grows to only £1,029,600, an annual rate of return of 0.6 percent.

**TABLE 9.2**  
**Annual TSRs for company W**

	Annual TSR	Value of £1m investment made at the end of 1999
2000	+10%	£1,100,000
2001	-20%	£880,000
2002	-40%	£528,000
2003	+30%	£686,400
2004	+50%	£1,029,600

TSRs must be used carefully. Fund managers are increasingly wary of using them in managerial incentive schemes because performance bonuses dependent on one-year TSRs may result in managers being rewarded for general stock market movements beyond their control – see Exhibit 9.1. Even worse would be the encouragement of the selective release of information to boost short-term TSR so that managers can trigger higher bonuses.

## Investor warns companies on measures for executive pay

Tony Tassell

One of the country's leading institutional investors has warned companies to avoid using share price-based performance measures in setting executive pay.

Standard Life, which has about £70bn of assets under management and owns about 2 per cent of the UK stock market, said it would oppose say packages solely based on share price-based performance targets such as total shareholder return – the share price movement of a company plus dividend payments.

The fund manager, one of the most activist in the UK market, said in its new corporate governance guidelines that pay schemes should be underpinned by

challenging performance targets of underlying financial performance such as earnings. 'We expect executive bonus and share incentive schemes to use challenging performance conditions that are neither too easy nor too tough to achieve,' said Guy Jubb, head of corporate governance. 'We continue to have reservations about the use of total shareholder return and other share price performance schemes.'

Some shareholders believe share price-based targets are influenced too much by factors outside management control such as general stock market sentiment.

### EXHIBIT 9.1 Investor warns companies on measures for executive pay

Source: *Financial Times* 2 December 2003

## Wealth Added Index (WAI)

The Wealth Added Index, developed by consultant firm Stern Stewart, measures the increase in shareholders' wealth through dividends received and share capital gains (or losses) over a period of time, say five years, after deducting the 'cost of equity', defined as the return required for shares of that risk class. It thus addresses one of the key criticisms of TSR by checking whether an impressive looking TSR has actually produced a return greater than the investor's opportunity cost given the length of time over which the TSR is measured.

To calculate the WAI first observe the rise in market capitalization (value of all the shares) over say five years. Deduct the rise that is due to the firm obtaining more money from shareholders in this period, for example from a rights issue. Then add back cash returned to shareholders in the form of dividends and share buy-backs. Then deduct the required return on the money shareholders committed to the company for the relevant period – this is the equity opportunity cost. (See Chapter 10 for a discussion on how this might be calculated.)

Under WAI analysis those companies whose share values grow more than the return required by investors create value. Those that return less than the required return destroy value. Take the case of Vodafone over the five years to December 2001 as shown in Exhibit 9.2. It increased market capitalization (+debt) by \$184,305m (that is \$57,588m + \$126,717m). However, according to WAI it

## Search for an index that can be counted on

Andrew Balls

Falling share prices remind investors of basic rules that may have been overlooked in the bull market. It is dangerous to focus on only one 'metric', be it earnings per share or earnings before interest, tax, depreciation and amortisation. Accounting numbers should be treated with caution. Mergers do not always work out as planned. Stock options do not necessarily align management and shareholder interests.

... Now, in response to the latest round of scandals and disappointment, Stern Stewart has come up with a new measure of performance: the wealth added index (WAI), which aims to measure corporate performance from the shareholder's perspective.

The new index judges a company's return on equity against its cost of equity, using the Capital Asset Pricing Model, the foundation of modern portfolio theory. While EVA is based on accounts, the simple WAI is based on share price performance. This allows cross-border comparisons between companies – and hence a global ranking.

To create wealth for shareholders, a company must provide returns that exceed the cost of equity. Earnings may go up, quarter after quarter, or following an acquisition. But that does not guarantee that a company is creating wealth. Rather, supranormal returns, above the cost of equity, create wealth; sub-par returns destroy wealth.

The WAI equation, put simply, measures the change in market capitalisation plus dividends, minus shareholders' required returns and net shares issued. To see what this means in practice look at the tables, which show the top and bottom 40 companies in the WAI.

Between 1997–2001. Wal-Mart's enterprise value increased by \$215bn and

Vodafone's enterprise value increased by \$184bn. Yet, according to Stern Stewart's measure, Wal-Mart created almost \$150bn (£97bn) of wealth for its shareholders while Vodafone destroyed \$105bn of shareholder wealth.

The difference is largely explained by capital Vodafone raised to deliver the growth in enterprise value – a total of almost \$242bn. This included roughly \$170bn of shares issued to acquire Mannesman and the debt raised to buy third-generation mobile phone licences ...

According to Erik Stern, managing director of Stern Stewart in Europe, the real value of the WAI comes in the analysis of the four pillars of wealth added represented on the table – and what this tells you about the company.

The first column measures what Stern Stewart calls the change in the value of profits. This takes the current level of profits, measured by net operating profit after tax, and values it as if this level of profits were to be earned indefinitely, using a simple formula. The change over the period measures the difference in the perpetuity value of the level of profits prevailing at the start and the end of the period.

The second column subtracts the value of profits from the company's enterprise value. This represents the value embedded in the share price for future growth – called the value of prospects. Again, comparing 1997 and 2001 gives the change in the market's valuation of the company's future growth prospects. Since profits tend to be fairly stable, most of the observed change reflects changes in the value of prospects, which amounts to a re-rating or de-rating of the stock.

## Wealth added index

Companies that have created the most wealth in the last five years ...

Dec 2001 (\$m)	Change in value of profitability	Change in value of prospects	Financing	Required return	WAI
Wal Mart Stores	45,809	168,482	2,616	62,013	<b>149,662</b>
Microsoft	42,822	188,267	11,875	125,435	<b>93,780</b>
IBM	16,034	109,261	-34,090	66,294	<b>93,092</b>
General Electric	109,881	242,896	96,949	163,971	<b>91,857</b>
Citigroup	n.a.	n.a.	n.a.	n.a.	<b>82,682</b>
Nokia	27,103	78,373	-9,494	32,814	<b>82,156</b>
Home Depot	22,814	70,566	4,732	29,269	<b>59,378</b>
Johnson & Johnson	30,396	77,377	5,048	46,708	<b>56,017</b>
Dell Computer	11,539	47,954	-1,788	25,929	<b>35,352</b>
Nestlé	25,050	32,684	3,418	19,707	<b>34,609</b>
Pfizer	74,097	123,125	105,149	61,362	<b>30,712</b>
Royal Bank of Scotland	51,542	10,987	21,831	11,585	<b>29,114</b>
Amgen	7,105	35,927	-520	14,470	<b>29,082</b>
Sanofi Synthelabo	10,587	32,309	6,727	8,770	<b>27,399</b>
Abbott Laboratories	8,683	43,232	-407	25,694	<b>26,627</b>
Shell Transport & Trading	52,199	-3,311	-25,581	49,678	<b>24,792</b>
Oracle	16,148	28,092	-10,101	30,535	<b>23,806</b>
Siemens	-6,041	53,333	5,533	18,693	<b>23,066</b>
Bristol Myers Squibb	23,397	20,686	-19,720	42,035	<b>21,768</b>
Lowe's	8,608	23,420	4,216	6,318	<b>21,494</b>
Wyeth	13,059	33,194	-1,338	26,439	<b>21,152</b>
Phillips Electronics	-20,190	50,820	-1,689	11,462	<b>20,858</b>
HSBC	23,938	35,870	16,714	22,330	<b>20,765</b>
Lilly, Eli	13,673	31,293	-6,786	31,025	<b>20,728</b>
Medtronic	6,016	41,925	11,672	15,880	<b>20,389</b>
Target	9,974	21,890	3,540	8,846	<b>19,479</b>
Barclays	30,387	2,397	-1,364	15,117	<b>19,031</b>
L'Oréal	8,288	22,492	-719	12,689	<b>18,810</b>
Total Fina Elf	97,128	-3,195	54,649	20,480	<b>18,803</b>
Telecom Italia	-461	55,816	16,503	20,715	<b>18,136</b>
Taiwan Semiconductor Man'	-1,081	39,621	10,845	10,289	<b>17,406</b>
Samsung Electronics	9,478	24,149	6,711	9,759	<b>17,158</b>
Takeda Chemical Industries	16,323	5,348	-3,106	8,677	<b>16,100</b>
Pepsico	15,973	19,431	-4,170	23,484	<b>16,089</b>
Novartis	9,768	30,181	-6,340	30,927	<b>15,362</b>
Kohl's	5,116	16,078	1,722	4,142	<b>15,330</b>
Ford Motor	-68,288	77,309	-29,829	23,929	<b>14,921</b>
Walgreen	5,335	19,878	1,117	9,340	<b>14,756</b>
Anheuser Busch	9,647	12,789	-3,974	12,064	<b>14,346</b>
British American Tobacco	17,619	-17,560	-20,984	6,878	<b>14,164</b>

### How the Wealth Added Index is calculated

The WAI builds on Total Shareholder Return. TSR measures capital appreciation plus dividends re-invested in the company's stock), making two adjustments. First it subtracts external capital raised (equity and debt raised but not retained profits). Second, it subtracts a capital charge, the cost of equity multiplied by the market capitalisation at the start of the period, to give a dollar sum. If new shares are issued, say to finance an acquisition, they are recognised at the date of issue.

## ... and those that have destroyed the most wealth

Dec 2001 (\$m)	Change in value of profitability	Change in value of prospects	Financing	Required return	WAI
Vodafone	57,588	126,717	241,671	47,207	-104,574
NTT	72,338	-123,667	281	39,252	-90,861
Lucent Technologies	-93,280	87,371	38,614	42,072	-86,594
AT&T	-69,731	99,949	53,403	54,468	-77,653
JDS Uniphase	-170	10,918	73,210	9,021	-71,483
Coca Cola	9,670	-23,250	-8,161	62,793	-68,211
WorldCom	51,683	-940	81,712	36,859	-67,827
Sumitomo Banking	-47,900	32,062	21,001	13,351	-50,190
Nortel Networks	-47,636	58,761	29,180	29,956	-48,011
Motorola	-13,737	12,335	16,233	23,146	-40,781
Deutsche Telekom	-16,253	69,336	51,213	41,739	-39,868
SBC Communications	48,638	65,317	97,565	50,550	-34,160
Boeing	22,055	-17,179	16,995	20,531	-32,651
Walt Disney	11,128	-16,627	-1,695	27,710	-31,515
Compaq Computer	-6,011	4,573	11,969	16,154	-29,651
Pacific Century Cyberworks	6,977	4,385	37,432	2,789	-28,860
Cisco Systems	-7,979	93,635	41,851	68,897	-24,092
Toyota Motor	51,063	-74,914	-27,566	27,068	-23,353
AOL Time Warner	80,054	81,419	150,434	34,160	-23,120
Eastman Kodak	-4,234	-10,606	-1,820	9,437	-22,457
Gillette	-96	-6,736	-4,139	19,616	-22,309
Asahi Bank	-46,506	30,028	1,653	3,892	-22,022
Bank One	35,492	-8,335	24,329	24,544	-21,716
British Telecommunication	-17,828	32,936	9,847	26,475	-21,214
Du Pont	-26,581	8,970	-22,589	25,846	-20,869
Corning	-1,524	610	10,126	9,765	-20,804
Verizon Communications	49,141	97,670	122,114	44,768	-20,072
Xerox	-5,208	-4,184	-422	10,543	-19,514
Pharmacia	10,665	20,495	32,954	17,429	-19,222
Cable & Wireless	-10,753	4,760	1,903	10,924	-18,820
Bank of America	35,640	35,303	41,469	47,857	-18,383
Roche	7,871	-1,796	-3,621	27,979	-18,284
Waste Management	20,941	1,439	32,419	8,003	-18,043
Singapore Telecommunications	2,098	-4,738	6,455	8,844	-17,939
KDDI	8,773	-5,050	17,683	3,916	-17,876
Mitsubishi Heavy Industries	-9,423	1,088	5,466	3,747	-17,548
Honeywell International	13,938	-1,465	16,674	12,568	-16,769
Yahoo!	63	8,759	13,415	11,978	-16,571
Sun Hung Kai Properties	n.a.	n.a.	n.a.	n.a.	-16,029
Alcatel	-32,421	43,679	14,156	12,735	-15,633

The first two columns of the table measure the change in a company's enterprise value (its market capitalisation plus its net debt) during the five years to December 2001. Add them together, and subtract the third column which is financing – capital raised, net of cash returned to shareholders as dividends and share buybacks – and then subtract the fourth column, the capital charge. The result is the wealth created or destroyed, in dollars.

**EXHIBIT 9.2** Search for an index that can be counted on

Source: *Financial Times* 9 October 2002



destroyed shareholder wealth because this rise was more than accounted for by the extra money taken from shareholders (and debt holders), e.g. \$170bn of shares issued to acquire Mannesman, during the five years. It raised an amazing total of \$241.7bn. If this is deducted from the increase in investors pot of wealth in Vodafone we end up with a negative number. And this is before we deduct the required rate of return on the amount of shareholders' money over the five years. This takes the wealth added down a further \$47bn into negative territory.

### Points to consider when using WAI

- Stern Stewart rely on the capital asset pricing model to calculate the required return on share capital. There are serious problems with this – see Chapter 10 for a discussion of the subject.
- There is an assumption that stock markets price shares correctly given company prospects at both the start and end dates. The experience of the tech bubble around the turn of the millennium should have raised a doubt here, let alone the evidence of share mispricing in the academic literature. So, one has to be skeptical as to whether outperformance is due to managerial skill or market movements. Volatile markets can turn a 'wealth creator' into a 'wealth destroyer'.
- Because the WAI measures in cash terms rather than percentages, the biggest companies appear at the top (and bottom) of the league tables pushing out smaller companies with higher percentage rates of return on shareholders' capital.

### Market Value Added (MVA)

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Stern Stewart & Co. has also developed the concept of Market Value Added (MVA). This looks at the difference between the total amount of capital put into the business by finance providers (debt and equity) and the current market value of the company's shares and debt. It provides a measure of how executives have performed with the capital entrusted to them. A positive MVA indicates value has been created. A negative MVA indicates value has been destroyed.

$$\text{MVA} = \text{Market value} - \text{Capital}$$

where:

Market value = Current value of debt, preference shares and ordinary shares.

Capital = All the cash raised from finance providers or retained from earnings to finance new investment in the business, since the company was founded.

Managers are able to push up the conventional yardstick, total market value of the business, simply by investing more capital. MVA, by subtracting capital injected or retained from the calculation, measures net value generated for shareholders.

### Illustration

MerVA plc was founded 20 years ago with £15m of equity finance. It has no debt or preference shares. All earnings have been paid out as dividends. The shares in the company are now valued at £40m. The MVA of MerVA is therefore £25m:

$$\text{MVA} = \text{Market value} - \text{Capital}$$

$$\text{MVA} = \text{£40m} - \text{£15m} = \text{£25m}$$

If the company now has a rights issue raising £5m from shareholders the market value of the firm must rise to at least £45m for shareholder wealth to be maintained. If the market value of the shares rose to only £44m because shareholders are doubtful about the returns to be earned when the rights issue money is applied within the business (that is, a negative NPV project) shareholders will lose £1m of value. This is summarized below:

	<i>Before rights issue</i>	<i>After rights issue</i>
Market value	£40m	£44m
Capital	£15m	£20m
MVA	£25m	£24m

According to Stern Stewart if a company pays a dividend both the 'market value' and the 'capital' parts of the equation are reduced by the same amount and MVA is unaffected. Imagine an all-equity financed company with an equity market value of £50m at the start of the year, which increased to £55m by the end of the year after generating £10m of post-tax profit in the year and the payment of a £6m dividend. The capital put into the firm by shareholders over the company's life by purchasing shares and retained earnings amounted to £20m at the start of the year.

	<i>Start of year</i>	<i>End of year</i>
Market value	£50m	£55m
Capital	£20m	£20m
	plus earnings	£10m
	less dividend	<u>-£6m</u>
		£24m
MVA	£30m	£31m

If the company had not paid the dividend then, according to Stern Stewart both the market value and the capital rise by £6m and MVA would remain at £31m. Thus:

	<i>Start of year</i>	<i>End of year</i>
Market value	£50m	£61m
Capital	£20m	£30m
MVA	£30m	£31m

This dividend policy irrelevance argument is challenged in Chapter 14, where it is shown that increasing or decreasing the dividend may add value. The point to take from this section is that profits produced by the business are just as much part of the ownership capital as money raised through the sale of shares to owners at the foundation of the business or in later years. If £1 is to be retained rather than paid out to shareholders then market capitalization should rise by £1 to avoid loss of shareholder value. If it does not, then that £1 can be put to a better use outside of the firm.

### A short cut

In the practical application of MVA analysis it is often assumed that the market value of debt and preference shares equals the book value of debt and preference shares. This permits the following version of MVA, cutting out the necessity to obtain data for the debt levels (market value or balance sheet value) or the preference share values:

$$\text{MVA} = \text{Ordinary shares market value} - \text{Capital supplied by ordinary shareholders}$$

### Judging managerial performance by MVA

The absolute level of MVA is perhaps less useful for judging performance than the change in MVA over a period. Alistair Blair, writing in *Management Today*,<sup>5</sup> is quite scathing about crude MVA numbers:

An MVA includes years old and now irrelevant gains and losses aggregated on a pound-for-pound basis with last year's results and today's hope or despair, as expressed in the share price. Surely, what we are interested in is current performance, or if we're going to be determinedly historic, performance since the current top management team got its hands on the controls.

What Alistair Blair seems to be proposing is that we convert MVA into a period (say five years) measure of performance so we can isolate the value-creating contribution of a particular span of years under the leadership of a team of managers.

## Points to consider when using MVA

There are a number of problems with MVA.

### Estimating the amount of cash invested

Measuring the amount of capital put into and retained within a business after it has been trading for a few years is fraught with problems. For example, does R&D expenditure produce an asset (i.e. become part of shareholders' funds) or is it an expense to be written off the profit and loss account? How do you treat goodwill on acquisitions? The accountants' balance sheet is not designed for measuring capital supplied by finance providers, but at least it is a starting point. Stern Stewart make use of a proxy measure called 'economic book value'. This is based on the balance sheet capital employed figure, subject to a number of adjustments. It has been pointed out by critics that these adjustments are rather arbitrary and complex, making it difficult to claim that economic book value equals the theoretically correct 'capital' in most cases.

### When was the value created?

The fact that a positive MVA is produced is often of limited use when it comes to evaluating the quality of the current managers. For a company that is a few decades old the value drivers may have been put in place by a previous generation of directors and senior managers. The MVA measure can be considered crude in that it measures value created over the entire life of the firm but fails to pinpoint when it was created. Nor does it indicate whether value creation has stopped and the firm is living off accumulated fat in terms of strong market positions, patents, etc. Ideally we need to know whether new value creating positions are being constructed rather than old ones being eroded.

### Is the rate of return high enough?

If it is not specified when value is created, it is difficult to know whether the amount generated is sufficiently in excess of capital used to provide a satisfactory return relative to the risk-adjusted time value of money. Positive MVA companies can produce poor rates of return. Take company B in the following example. It has a much lower rate of return on capital than A and yet it has the same MVA.

	A	B
MVA	£50m	£50m
Market value	£100m	£100m
Capital	£50m	£50m
Age of firm	3 years	30 years

(Both firms have paid out profits each year as dividends, therefore the capital figure is the starting equity capital.)

### Inflation distorts MVA

If the capital element in the equation is based on a balance sheet figure then during times of inflation the value of capital employed may be understated. If capital is artificially lowered by inflation *vis-à-vis* current market value for companies where investment took place a long time ago then MVA will appear to be superior to that for a similar firm with recently purchased assets.

### MVA is an absolute measure

Judging companies on the basis of absolute amounts of pounds means that companies with larger capital bases will tend to be at the top (and bottom) of the league tables of MVA performance. Size can have a more significant impact on MVA than efficiency. This makes comparing firms of different sizes difficult. The next metric examined, the market to book ratio, is designed to alleviate this problem.

## Market to Book Ratio (MBR)

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Rather than using the arithmetical difference between the capital raised and the current value, as in MVA, the MBR is the market value divided by the capital invested. If the market value of debt can be taken to be the same as the book value of debt then a version of the MBR is the ratio of the market value of the company's ordinary shares to the amount of capital provided by ordinary shareholders (if preference share capital can be regarded as debt for the purpose of value-based management).

There is, of course, the problem of estimating the amount of capital supplied, as this usually depends on adjusted balance sheet net asset figures. For example, goodwill write-offs and other negative reserves are reinstated, as in MVA. It is also suggested that asset values be expressed at replacement cost so that the MBR is not too heavily distorted by the effects of inflation on historic asset figures.

### Illustration

MaBaR plc has an equity market value of £50m, its book debt is equal to the market value of debt, and the adjusted replacement cost of assets attributable to ordinary shareholders amounts to £16m.

Market value	£50m
Capital	£16m
MVA	£34m
MBR $\frac{£50m}{£16m}$	= 3.125

MaBaR has turned every pound put into the firm into £3.125.

The rankings provided by MBR and MVA differ sharply. The largest companies dominating the MVA ranks generally have lower positions when ordered in terms of MBR.

Care must be taken when using MBR for performance measurement and target setting because if it is wrongly applied it is possible for positive NPV projects to be rejected in order for MBR to be at a higher level. Take the case of a company with an MBR of 1.75 considering fundraising to make an investment of £10m in a project estimated to produce a positive NPV of £4m. Its market to book ratio will fall despite the project being shareholder wealth enhancing.

	<b>Before project</b>		<b>After project acceptance</b>	
Value of firm	£70m	(70 + 10 + 4)		£84m
Capital	£40m			£50m
MVA	£30m			£34m
MBR	70/40 =	1.75	84/50 =	1.68

The new project has an incremental MBR of 1.4 (14/10 = 1.4). This is less than the firm's original overall MBR of 1.75, so this is dragged down by accepting of the project. This effect should be ignored by managers motivated by shareholder wealth enhancement. They will focus on NPV.

## Conclusion

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TSR, WAI, MVA and MBR should be seen not as competitors, but as complementary, especially as each has serious drawbacks. Relying on one indicator is unnecessarily restrictive. It is perfectly possible to use all these measures simultaneously, thereby overcoming many of the weaknesses of each individually. And don't forget that the measures described in the previous chapter may be used alongside these in the assessment of value creation by the entire firm.

## Notes

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- 1 Wealth Added Index and WAI are both registered trademarks of the consulting firm Stern Stewart.
- 2 Market Value Added and MVA are both registered trademarks of the consulting firm Stern Stewart.
- 3 George Graham, 'HSBC's new guiding light aims to outshine peer group', *Financial Times*, 23 February 1999, p. 25.
- 4 Nikki Tait, 'Ford aims to slash \$1bn from cash base this year', *Financial Times*, 8 January 1999, p. 17.
- 5 Alistair Blair, *Management Today*, January 1997, p. 44.



## WHAT IS THE COMPANY'S COST OF CAPITAL?

Introduction

A word of warning

The required rate of return

Two sides of the same coin

The weighted average cost of capital

The cost of equity capital

The cost of retained earnings

The cost of debt capital

The cost of preference share capital

Hybrid securities

Calculating the weights

The WACC with three or more types of finance

Classic error

What about short-term debt?

Applying the WACC to projects and SBUs

What do managers actually do?

Implementations issues

Which risk-free rate?

Fundamental beta

Some thoughts on the cost of capital

Conclusion



## Introduction

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Until this point a cost of capital (required rate of return) has been assumed for, say, a project or a business unit strategy, but we have not gone into much detail about how an appropriate cost of capital is calculated. This vital issue is now addressed.

The objective set for management in a value-based organization is the maximization of long-term shareholder wealth. This means achieving a return on invested money that is greater than shareholders could obtain elsewhere for the same level of risk. Shareholders, and other finance providers, have an opportunity cost associated with putting money into your firm. They could withdraw the money placed with you and invest it in a comparable company's securities. If, for the same risk, the alternative investment offers a higher return than your firm's shares, then as a management team you are destroying shareholder wealth.

**The cost of capital is the rate of return that a company has to offer finance providers to induce them to buy and hold a financial security.**

The cost of capital is the rate of return that a company has to offer finance providers to induce them to buy and hold a financial security. This rate is determined by the returns offered on alternative securities with the same risk.

Using the correct cost of capital as a discount rate is important. If it is too high investment will be constrained, firms will not grow as they should and shareholders will miss out on value-enhancing opportunities. There can be a knock-on effect to the macro-economy and this worries politicians. For example, the one-time President of the Board of Trade, Michael Heseltine, complained:

Businesses are not investing enough because of their excessive expectations of investment returns ... The CBI tells me that the majority of firms continue to require rates of return above 20 per cent. A senior banker last week told me his bank habitually asked for 30 per cent returns on capital.<sup>1</sup>

This chapter focusses on the question of how to measure the returns available on a variety of financial securities at different risk levels. This will be developed into an overall cost of capital for the firm and provide a method for calculating the benchmark rate for the firm, SBUs and projects.

## A word of warning

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Too often, the academics and consultants give the impression of scientific preciseness when calculating a firm's cost of capital. The reality is that behind any final number generated lies an enormous amount of subjective assessment or, worse, opinion. Choices have to be made between competing judgments on a range of issues, including the appropriate risk premium, financial gearing level and risk measure. Good decision-making comes from knowing the limitations of the input variables to the decision. Knowing where informed judgment has been

employed in the cost of capital calculation is required to make value-enhancing decisions and thus assist the art of management. In short, the final number for the required rate of return is less important than knowledge of the factors behind the calculation and the likely size of the margin of error. Precision is less important than knowledge of what is a reasonable range.

## The required rate of return

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The capital provided to large firms comes in many forms. The main forms are equity and debt capital, but there are a number of hybrids, such as convertible bonds. When a finance provider chooses to supply funds in the form of debt finance, there is a deliberate attempt to reduce risk. This can be achieved in a number of ways: by imposing covenants on management which, for example, restrict the gearing (proportion of debt to share capital) level or maintain an interest cover ratio (e.g. annual profit must remain four times greater than annual interest); accept assets as security; by ensuring that the lenders are ahead of other finance providers (particularly ordinary and preference holders) in terms of annual pay-outs and in the event of liquidation.

A lender to a corporation cannot expect to eliminate all risk and so the required rate of return is going to be above that of lending to a reputable State such as the USA or the UK. Placing your savings with the UK government by buying its bonds in return for the promise of regular interest and the payment of a capital sum in a future year is the closest you are going to get to risk-free lending. The rate of return offered on government bonds and Treasury bills (lending that is repaid in a few months) is the bedrock rate that is used to benchmark other interest rates. It is called the risk-free rate of return, or given the symbol  $r_f$ .

A stable well-established company with a relatively low level of borrowing and low risk operations might have to pay a slightly higher rate of return on debt capital than the UK government. Such a company, if it issued a corporate bond with a high credit rating (low risk of default), would pay, say, an extra 100 basis points (i.e. 1%) per year. This is described as the risk premium (RP) on top of the risk-free rate. Then, the cost of debt capital,  $k_D$ , is:

$$k_D = r_f + \text{RP}$$

If the current risk free rate is 6 percent, then  $k_D = 7$  percent.

If the firm already has a high level of debt and wishes to borrow more it may need to offer as much as 800 basis points above the risk-free rate. The credit rating is likely to be below investment grade (below BBB- by Standard and Poor's and Baa3 by Moody's – see Chapter 16 for more details) and therefore will be classified as a high-yield (or junk) bond. So the required return might be 14 percent.

$$k_D = r_f + \text{RP} = 6 + 8 = 14\%$$

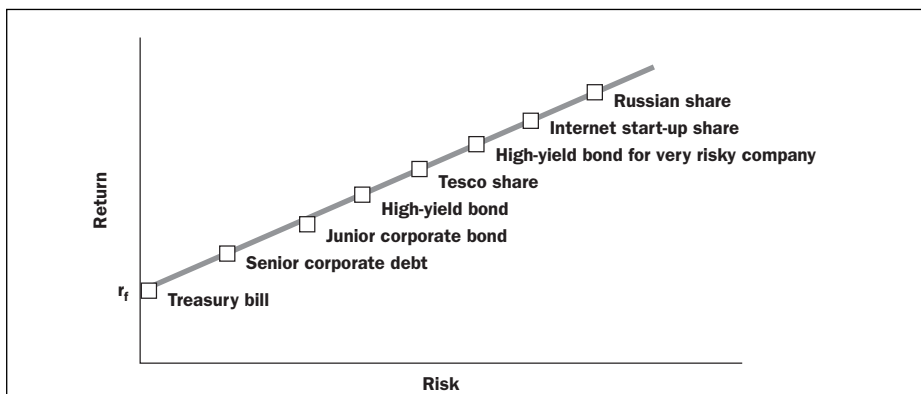
If the form of finance provided is equity capital then the investor is accepting a fairly high probability of receiving no return at all on the investment. The firm has no obligation to pay annual dividends, and other forms of capital have prior claims on annual cash flows. If the firm does less well than expected then it is, generally, ordinary shareholders who suffer the most. If the firm performs well very high returns can be expected. It is the expectation of high returns that causes ordinary shareholders to accept high risk – a large dispersion of returns.

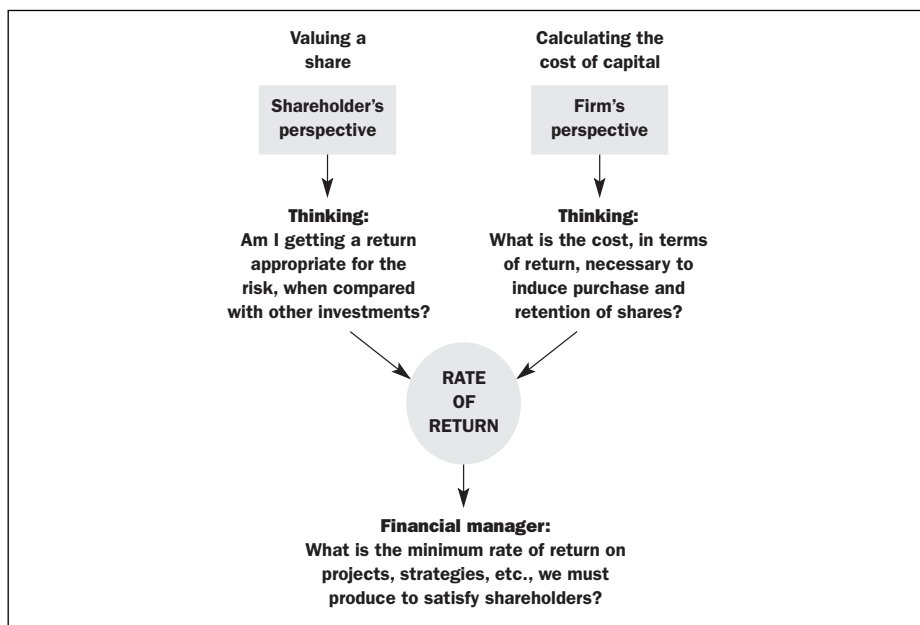
Different equities have different levels of risk, and therefore returns. A shareholder in Tesco is likely to be content with a lower return than a shareholder in, say, an internet start-up, or a company quoted on the Russian Stock Exchange. Thus we have a range of financial securities with a variety of risk and associated return – see Figure 10.1.

## Two sides of the same coin

The issues of the cost of capital for managerial use within the business and the value placed on a share (or other financial security) are two sides of the same coin. They both depend on the level of return. The holders of shares make a valuation on the basis of the returns they estimate they will receive. Likewise, from the firm's perspective, it estimates the cost of raising money through selling shares as the return that the firm will have to pay to shareholders to induce them to buy and hold the shares. The same considerations apply to bondholders, preference shareholders and so on. If the future cash flowing from the form of finance is anticipated to fall from a previously assumed level then the selling price of the share, bond, etc. goes down until the return is at the level dictated by the returns on financial securities of a similar type and risk. If a company fails to achieve returns that at least compensate finance providers for their opportunity cost it is unlikely to survive for long. Figure 10.2, taking shares as an example, illustrates that valuing a share and the cost of equity capital are two sides of the same coin.

**FIGURE 10.1**  
Risk-return – hypothetical examples



**FIGURE 10.2****Two sides of the same coin****The weighted average cost of capital (WACC)**

We have established that firms need to offer returns to finance providers commensurate with the risk they are undertaking. The amount of return is determined by what those investors could get elsewhere at that risk level (e.g. by investing in other companies). If we take a firm that is financed entirely by share capital (equity) then the required rate of return to be used in value analysis, e.g. a project or SBU appraisal, is the required return demanded by investors on the company's shares. However, this is only true if the new project (or division) has the same level of risk as the existing set of projects.

The stock market prices shares on the basis of the current riskiness of the firm. This is determined by the activities it undertakes. A company can be seen as merely a bundle of projects from the perspective of ordinary shareholders. If these projects are, on average, of high risk then the required return will be high. If the proposed project (or division) under examination has the same risk as the weighted average of the current set then the required return on the company's equity capital is the rate appropriate for this project (if the company received all its capital from shareholders and none from lenders). If the new project has a lower risk, the company-wide cost of capital needs to be adjusted down for application to this project.

If, however, we are dealing with a company that has some finance in the form of debt and some in the form of equity the situation becomes a little more com-

plicated. Imagine that a corporation is to be established by obtaining one-half of its £1,000m of capital from lenders, who require an 8 percent rate of return for an investment of this risk class, and one-half from shareholders, who require a 12 percent rate of return for the risk they are accepting. Thus we have the following facts:

Cost of debt,		$k_D = 8\%$
Cost of equity,		$k_E = 12\%$
Weight of debt	£500m / £1bn	$W_D = 0.5$
Weight of equity	£500m / £1bn	$W_E = 0.5$

The weighted average cost of capital (WACC) must be established to calculate the minimum return needed on an investment within the firm, that will produce enough to satisfy the lenders and leave just enough to give shareholders their 12 percent return. Anything less than this WACC and the shareholders will receive less than 12 percent. They will recognize that 12 percent is available elsewhere for that level of risk and remove money from the firm.

Weighted Average Cost of Capital,  $WACC = k_E W_E + k_D W_D$

$$WACC = 12 \times 0.5 + 8 \times 0.5 = 10\%$$

### Illustration

Take a firm that produces a 10 percent return on money invested in a project, the same as its WACC. If the firm invested £100,000 in a project that produced a net cash flow per year of £10,000 to infinity (assuming a perpetuity makes the example simple), the first call on that cash flow is from the debt holders, who effectively supplied £50,000 of the funds. They require £4,000 per annum. That leaves £6,000 for equity holders – an annual return of 12 percent on the £50,000 they provided.

If things go well and a return of £11,000 (i.e. 11%) is generated then debt holders still receive the contracted amount of £4,000, but the equity holders get a return significantly above the minimum they require at 14 percent return: £7,000 is left to pay out to shareholders on their £50,000 capital input to this project.

### Lowering the WACC and increasing shareholder returns

Examining the WACC formula we see an apparently simple way of reducing the required rate of return, and thus raise the value of a project, division or the entire firm: change the weights in the formula in favor of debt. In other words, alter the capital structure of the firm by having a higher proportion of its capital in the form of cheaper debt.

For example, if the company is expected to produce £100m cash flow per year (to infinity) and its WACC is 10 percent its total corporate value ('enterprise' value that is, the value of the debt and equity) is:

$$£100\text{m} / 0.10 = £1,000\text{m}$$

Let us try to lower the WACC.

Imagine that instead of the firm being established with 50 percent debt in its overall capital, it is set up with 70 percent debt. The proportion of total capital in the form of equity is therefore 30 percent. *If* (a big if) the equity holders remain content with a 12 percent return while the debt holders accept an 8 percent annual return the WACC will fall, and the value of the firm will rise.

$$\text{WACC} = k_E W_E + k_D W_D$$

$$\text{WACC} = 12 \times 0.3 + 8 \times 0.7 = 9.2\%$$

$$\text{Firm value} = £100\text{m} / 0.092 = £1,086.96\text{m}$$

Why don't all management teams increase the proportion of debt in the capital structure and magic-up some shareholder value? The fly in the ointment for many firms is that equity investors are unlikely to be content with 12 percent returns when their shares have become more risky due to the additional financial leverage. The key question is: how much extra return do they demand? The financial economists and Nobel laureates Franco Modigliani and Merton Miller (MM) presented the case that in a perfect capital market (all participants such as shareholders and managers have all relevant information, all can borrow at same interest, etc.) the increase in  $k_E$  would exactly offset the benefit from increasing the debt proportion, to leave the WACC constant so increasing the debt proportion does not add to shareholder value – the only factor that can add value is the improvement in the underlying performance of the business, i.e. its cash flows. According to this view (that there is no optimal capital structure that will maximize shareholder wealth) there is no point in adjusting the debt or equity proportions.

In this stylized world  $k_D$  remains at 8 percent, but  $k_E$  moves to 14.67 percent, leaving WACC, firm value, and shareholder value constant.

$$\text{WACC} = k_E W_E + k_D W_D$$

$$\text{WACC} = 14.67 \times 0.3 + 8 \times 0.7 = 10\%$$

However, there is hope for managers trying to improve shareholder wealth by adjusting the capital structure because in constructing a perfect world Modigliani and Miller left out at least two important factors: tax and financial distress.<sup>2</sup>

## The benefit of tax

First tax. A benefit of financing through debt is that the annual interest can be used to reduce taxable profit thus lowering the cash that flows out to the tax authorities. In contrast, the annual payout on equity (dividends) cannot be used

to reduce the amount of profit that is taxed. The benefits gained from being able to lower the tax burden through financing through debt reduces the effective cost of this form of finance.

To illustrate: Firm A is a company in a country that does not permit interest to be deducted from taxable profit. Firm B is in a country that does permit interest to be deducted. In both companies the interest is 8 percent on £500m. Observe the effect on the amount of profit left for distribution to shareholders:

	Firm A £m	Firm B £m
Profits before interest and tax	100	100
Interest	—	-40
Taxable profit	<u>100</u>	<u>60</u>
Amount taxed @ 30%	-30	-18
Interest	-40	—
Amount available for distribution shareholders	<u>30</u>	<u>42</u>

The extra £12m for Firm B reduces the effective cost of debt from 8 percent to only  $8(1 - T)$ , where  $T$  = the corporation tax rate, 30 percent. The cost of debt capital falls to  $8(1 - 0.3) = 5.6$ , or £28m on £500m of debt. The taxman, by taking £12m less from the company purely because the tax rules allow the deductibility of interest from taxable profit, lowers the effective cost of the debt.

So including the ‘tax shield’ effect we find a reduction in the WACC that leads to an increase in the amount available for shareholders. In our example, if we assume tax on corporate profits at 30 percent then the effective cost of debt falls to 5.6 percent. Resulting in the WACC becoming 8.8 percent.

So, if:

$$k_{\text{DBT}} = \text{cost of debt before tax benefit} = 8\%$$

$$k_{\text{DAT}} = \text{cost of debt after tax benefit} = 8(1 - T) = 8(1 - 0.30) = 5.6\%$$

If we assume a 50:50 capital structure the WACC is:

$$\text{WACC} = k_E W_E + k_{\text{DAT}} W_D$$

$$\text{WACC} = 12 \times 0.5 + 5.6 \times 0.5 = 8.8\%$$

Investment project cash flows discounted at this lower rate will have a higher present value than if discounted at 10 percent. Given that the debt holders receive only their contractual interest and no more this extra value flows to shareholders.

### **But, financial distress constrains gearing**

The introduction of the tax benefit strongly pushes the bias towards very high gearing levels to obtain a lower WACC and higher value. However, such extreme gearing is not observed very often in real world companies. There are a number

of reasons for this, the most important of which is the increasing risk to the finance providers (particularly equity capital holders) of financial distress and, ultimately, liquidation. (See Chapter 18 for more reasons.)

As gearing rises so does the probability of equity investors receiving a poor (no) return. So they demand higher expected returns to compensate. At first, the risk premium rises slowly, but at high gearing levels it rises so fast that it more than offsets the benefit of increasing debt in the capital structure. This is demonstrated in Figure 10.3, in which the WACC at lower levels of debt is primarily influenced by the increasing debt proportion in the capital structure, and at higher levels by the rising cost of equity (and eventually debt).

The conclusion drawn from the capital structure literature is that there is an optimal gearing level that achieves the lowest WACC and highest firm value – discussed in more detail in Chapter 18. When companies are calculating their WACC they should use this target gearing ratio and not a gearing ratio they happen to have at the time of calculation.

So, if in our example case the required return on equity rises from 12 percent to 13 percent when the proportion of the debt in the capital structure rises to 65 percent from 50 percent and the effective rate of return payable on debt is 5.6 percent after the tax shield benefit (i.e. remaining at 8 percent before the tax benefit) then the WACC falls and the value available for shareholders rises.

$$\text{WACC} = k_E W_E + k_{\text{DAT}} W_D$$

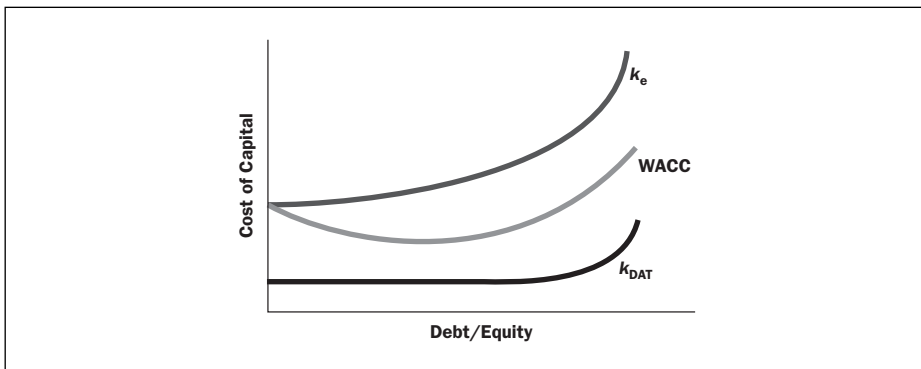
$$\text{WACC} = 13 \times 0.35 + 5.6 \times 0.65 = 8.19\%$$

### Taking financial gearing too far

For this particular company we will assume that 65 percent gearing is the optimum debt/equity ratio. If we go to 80 percent debt we find this reduces shareholder wealth because the firm's projects (in aggregate) are now discounted at a higher rate of return reducing their present value. The reason the

**FIGURE 10.3**

**Cost of capital with different capital structures**





discount rate rises significantly is that the required return on shares rises to, say, 30 percent as investors fear massive potential loss due to the large commitment of the firm to pay out interest whether or not the firm is doing well (for simplicity we assume that the cost of debt remains the same – in reality, at high gearing levels it would rise pushing up the WACC even further).

$$\begin{aligned} \text{WACC} &= k_E W_E + k_{\text{DAT}} W_D \\ \text{WACC} &= 30 \times 0.2 + 5.6 \times 0.8 = 10.48\% \end{aligned}$$

### Worked example 10.1

#### Poise plc

The rate of return offered to debt holders before considering the benefit to shareholders of the tax shield,  $k_{\text{DBT}}$ , is 10%, whereas the required return on equity is 20%. The total amount of capital in use (equity + debt),  $V$ , is £2m. Of that, £1.4m represents the market value of its equity,  $V_E$ , and £600,000 equals the market value of its debt,  $V_D$ . These are the optimum proportions of debt and equity.

Thus:

$$\begin{aligned} k_{\text{DBT}} &= 10\% \\ k_E &= 20\% \\ V &= \text{£}2\text{m} \\ V_E &= \text{£}1.4\text{m} \\ V_D &= \text{£}0.6\text{m} \end{aligned}$$

The weight for equity capital is:

$$W_E = \frac{V_E}{V} = \frac{1.4}{2.0} = 0.7$$

The weight for debt is:

$$W_D = \frac{V_D}{V} = \frac{0.6}{2.0} = 0.3$$

The corporate tax rate is 30% and therefore the after-tax cost of debt is:

$$\begin{aligned} k_{\text{DAT}} &= k_{\text{DBT}} (1 - T) \\ k_{\text{DAT}} &= 10 (1 - 0.30) = 7\% \end{aligned}$$

The weighted average cost of capital for Poise is:

$$\begin{aligned} \text{WACC} &= k_E W_E + k_{\text{DAT}} W_D \\ &= 20\% \times 0.7 + 7\% \times 0.3 \\ &= \mathbf{16.1\%} \end{aligned}$$

This is the rate of return Poise needs to achieve on new business projects if they are of the same risk as the average risk of current set of projects. If the new projects are of higher or lower risk an adjustment needs to be made to the discount rate used – this is discussed later in the chapter.

For example, if Poise is considering a project that requires an investment of £1m at time 0 and then produces after tax annual cash flows before interest payments of £161,000 as a perpetuity (i.e. it achieves a 16.1% rate of return) then the net cost of satisfying the debt holders after the tax shield benefit is £21,000. (The debt holders supplied 30% of the £1m invested, i.e. £300,000; and the cost to the firm of satisfying them is £300,000 × 7% = £21,000.) The remainder of the annual cash flows go to the shareholders; so they receive £140,000 per year which is a 20% return on the £700,000 they supplied.

If the project produces a much lower annual cash flow of £100,000 (a rate of return of 10%) then the debt holders still receive £21,000, leaving only £79,000 for the shareholders. These investors could have achieved a return of 20% by investing in other companies at this level of risk. An annual return of £79,000 represents a mere 11.3% return (£79,000/£700,000). Thus shareholders suffer a loss of wealth relative to the forgone opportunity.

## The cost of equity capital

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A shareholder has in mind a minimum rate of return determined by the returns available on other shares of the same risk class. Managers, in order to maximize shareholder wealth, must obtain this level of return for shareholders from the firm's activities. If a company does not achieve the rate of return to match the investor's opportunity cost it will find it difficult to attract new funds and will become vulnerable to take-over or liquidation.

With debt finance there is generally a specific rate payable for the use of capital. In contrast, ordinary shareholders are not explicitly offered specific payments. However, an implicit rate of return must be offered to attract investors – it is the expectation of high returns that causes ordinary shareholders to accept high risk.

Investors in shares require a return that provides for two elements. First, they need a return equal to the risk-free rate (usually taken to be that on government securities). Second, there is the risk premium, which rises with the degree of systematic risk (systematic risk is explained below).

Rate of return on shares = Risk-free rate + Risk premium

$$k_E = r_f + RP$$

The risk-free rate gives a return sufficient to compensate for both impatience to consume and inflation (see Chapter 2).<sup>3</sup> To estimate the relevant risk premium on a company's equity there are two steps.

- Step one estimates the average extra return demanded by investors above the risk-free return to induce them to buy a portfolio of average-risk level shares. We look back at the returns shareholders have actually received on average-risk shares above the risk-free return in the past and make the assumption that this is what they also demanded before the event – *ex ante* in the jargon. The average annual risk premium actually obtained by shareholders can only be calculated over an extended period of time (many decades) as short-term returns on shares can be distorted (they are often negative for a year, for example). This is expressed as the difference between the market return,  $r_m$ , and the risk-free return,  $r_f$  that is  $(r_m - r_f)$ .
- Step two adjusts the risk premium for a typical (average-risk level) share to suit the risk level for the particular company's shares under consideration. If the share is more risky than the average then  $(r_m - r_f)$  is multiplied by a systematic risk factor greater than 1. If it is less risky it may be multiplied by a systematic risk factor of, say, 0.8 to reduce the risk premium.

To understand the origin of the most popular method of calculating the cost of equity capital, the capital asset pricing model, it is necessary to first of all deal with the issues of shareholder diversification, the elimination of unsystematic risk and the focus on the variable called beta.

## Diversification

If an investor only has one company's shares in his 'portfolio' then risk is very high. Adding a second reduces risk. The addition of a third and fourth continues to reduce risk but by smaller amounts. This sort of effect is demonstrated in Figure 10.4. The reason for the risk reduction is that security returns generally do not vary with perfect positive correlation. That is, returns do not go up together and down together by the same percentages at the same time. At any one time the good news about one share is offset to some extent by bad news about another.

Generally within a portfolio of shares if one is shooting up, others are stable, going down or rising. Each share movement depends mostly on the particular news emanating from the company. News is generally particular to companies and we should not expect them each to report good (or bad) news on the same day. So, if on a day one share in the portfolio reports the resignation of brilliant chief executive we might expect that share to fall. But, because the portfolio owner is diversified the return on the portfolio will not move dramatically downward. Other companies are reporting marketing coups, big new contracts, or whatever, pushing up their share prices. Others (the majority?) are not reporting any news and their share prices do not move much at all. The point is that by

not having all your eggs in one basket you reduce the chance of the collective value of your investments falling off a cliff. The risk, or volatility, of the value of the portfolio, as measured by standard deviation, is reduced. The greater the extent of diversification, the lower the standard deviation (see Chapter 5 for a discussion of standard deviation).

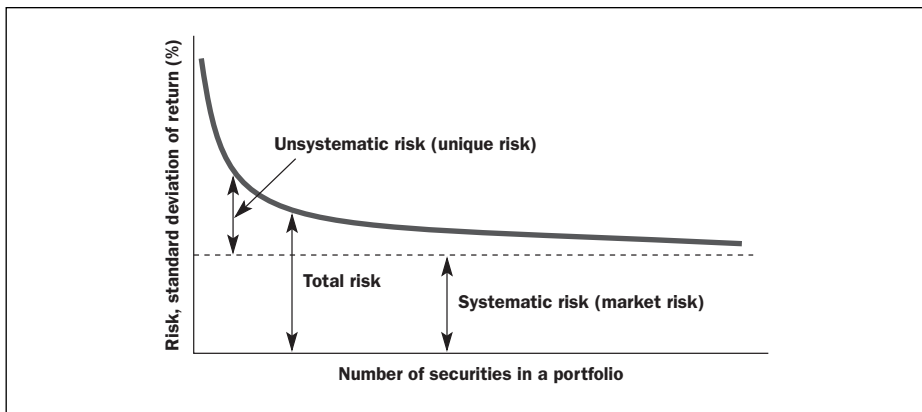
So, despite the fact that returns on individual shares can vary dramatically a portfolio will be relatively stable. The type of risk being reduced through diversification is referred to as unsystematic (unique, or specific) risk. This element of variability in a share's return is due to the specific circumstances of the individual firms. In a portfolio these individual ups and downs tend to cancel out. Another piece of jargon applied to this type of risk is that it is 'diversifiable'. That is, it can be eliminated simply by holding a sufficiently large portfolio.

### Systematic risk

However, no matter how many shares are held there will always be an element of risk that cannot be canceled out by broadening the portfolio. This is called systematic (or market) risk. There are some risk factors common to all firms to a greater or lesser extent. These include macroeconomic movements such as economic growth, inflation and exchange rate changes. No firm is entirely immune from these factors. For example, a deceleration in GDP growth or a rise in tax rates is likely to impact on the returns of all firms within an economy.

Note, however, that while all shares respond to these system-wide risk factors they do not all respond equally. Some shares will exhibit a greater sensitivity to these systematic risk elements than others. The revenues of the luxury goods sectors, for example, are particularly sensitive to the vicissitudes of the economy. Spending on electrical goods and sports cars rises when the economy is in a strong growth phase but falls off significantly in recession. On the other hand,

**FIGURE 10.4**  
Systematic and unsystematic risk



some sectors experience limited variations in demand as the economy booms and shrinks; the food producing and food retailing sectors are prime examples here. People do not cut down significantly on food bought for home consumption despite falling incomes.

It is assumed, quite reasonably, that investors do not like risk. If this is the case then the logical course of action is going to be to eliminate as much unsystematic risk as possible by diversifying. Most of the shares in UK companies are held by highly diversified institutional investors. While it is true that many small investors are not fully diversified it is equally true that the market, and more importantly, market returns are dominated by the actions of fully diversified investors. These investors ensure that the market does not reward investors for bearing some unsystematic risk.

To understand this imagine that by some freak accident a share offered a return of say 50 percent per annum which includes compensation for both unsystematic and systematic risk. There would be a mad scramble to buy these shares, especially by the major diversified funds which don't care about the unsystematic risk on this share – they have other share returns to offset the oscillations of this new one. The buying pressure would result in a rise in the share price. This process would continue until the share offered the same return as other shares with that level of systematic risk (the cash flows, e.g. dividends, expected from the company remain constant but the share price rises therefore returns on the purchase price of the share fall).

Let us assume that the price doubles and therefore the return offered falls to 25 percent. The undiversified investor will be dismayed that he can no longer find any share that will compensate for what he perceives as the relevant risk for him, consisting of both unsystematic and systematic elements.

In the financial markets the risk that matters is the degree to which a particular share tends to move when the market as a whole moves. This is the only issue of concern to the investors that are fully diversified because ups and downs due to specific company events do not affect the return on the portfolio – only market-wide events affect the portfolio's return.

This is leading to a new way of measuring risk. For the diversified investor the relevant measure of risk is no longer standard deviation of returns, it is its systematic risk.

## Beta

The capital asset pricing model (CAPM) defined this systematic risk as beta.<sup>4</sup> Beta,  $\beta$ , measures the covariance between the returns on a particular share with the returns on the market as a whole (usually measured by a market index, FTSE All Share index). That is, the beta value for a share indicates the sensitivity of that share to general market movements. A share with a beta of 1.0 tends to have returns that move broadly in line with the market index. A share with a beta greater than 1.0 tends to exhibit amplified return movements compared to

the index. For example, BT has a beta of 1.62 and, according to the CAPM, when the market index return rises by say 10 percent the returns on BT's shares will tend to rise by 16.2 percent. Conversely if the market falls by 10 percent then BT's shares' returns will tend to fall by 16.2 percent.

Shares with a beta of less than 1.0, such as M&S with a beta of 0.50, will vary less than the market as a whole. So, if the market is rising shares in M&S will not enjoy the same level of upswing. However should the market ever suffer a downward movement for every 10 percent decline in shares generally M&S will give a return decline of only 5 percent, it is therefore less risky than a share in BT according to CAPM. (*Note:* These co-movements are to be taken as statistical expectations rather than precise predictions – thus over a large sample of return movements M&S's returns will move by 5 percent for a 10 percent market movement, if beta is a correct measure of company to market returns. On any single occasion the co-movements may not have this relationship.) Table 10.1 displays the betas for some large UK companies.

**TABLE 10.1**  
**Betas as measured in 2003**

Share	Beta	Share	Beta
BOC Group	0.79	Barclays Bank	1.11
BT	1.62	Marks and Spencer	0.50
Sainsburys (J)	0.80	Great Universal Stores	0.97

Source: Datastream

The basic features of beta are:

When

- $\beta = 1$  A 1% change in the market index return leads to a 1% change in the return on a specific share
- $0 < \beta < 1$  A 1% change in the market index return leads to a less than 1% change in the returns on a specific share
- $\beta > 1$  A 1% change in market index return leads to a greater change than 1% on a specific company's share.

### The security market line (SML)

Risk has been defined for a fully diversified investor in an efficient market as systematic risk because this is the risk that cannot be diversified away and so a higher return is required if an investor is to bear it. In the CAPM the relationship between risk as measured by beta and expected return is shown by the *security market line* as in Figure 10.5. Shares perfectly correlated with the market return ( $r_m$ ) will have a beta of 1.0 and are expected to produce an annual return of 10.4 percent in the circumstances of a risk-free rate of return at 6 percent and the

risk-premium on the market portfolio of shares over safe securities at 4.4 percent (we will examine the origin of this number later). Shares that are twice as risky, with a beta of 2, will have an expected return of 14.8 percent (that is the risk-free return of 6 percent plus two times the risk premium on averagely risky shares of 4.4 percent). Shares that vary half as much as the market index are expected to produce a return of 8.2 percent (which is 6 percent plus one-half of 4.4 percent) *in this particular* hypothetical risk-return line.

To find the level of return expected for a given level of beta risk the following equation can be used:

Expected return	=	risk-free rate	+	beta ×	Expected return on the market minus the risk-free rate (the average risk premium for a typical share)
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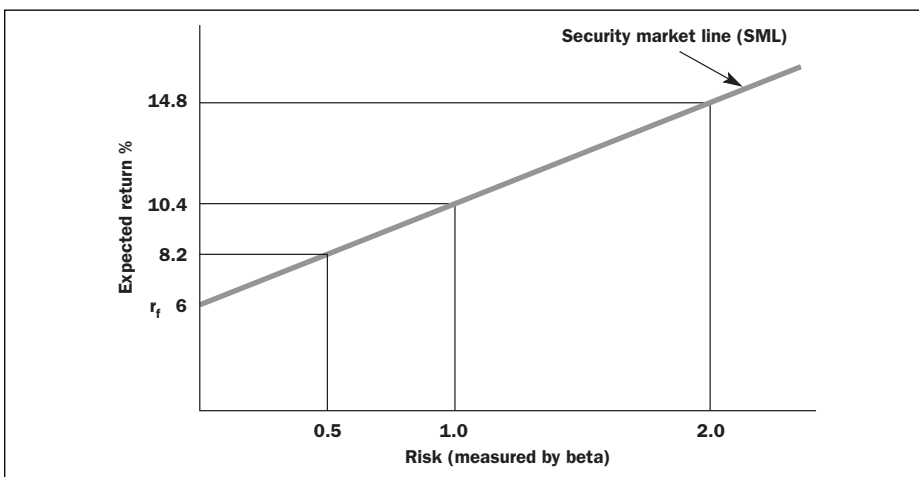
or 
$$k_E = r_f + \beta (r_m - r_f)$$

For a share with a beta of 1.55 when the risk-free return is 6 percent the expected return will be:

$$k_E = 6 + 1.55 (10.4 - 6) = 12.8\%$$

The better way of presenting this is to place the risk premium in the brackets rather than  $r_m$  and  $r_f$  separately because this reminds us that what is important in the risk premium is the required extra return over the risk-free rate as revealed by investors over many years – not the current market returns and risk-

**FIGURE 10.5**  
A hypothetical security market line (SML)



free rate. It is amazing how often financial journalists get this wrong and fixate on recent and current  $r_m$  and  $r_f$  rather than the long-term historical difference between the two. Taking a short period to estimate this would result in wild fluctuations from year to year none of which would reflect the premiums investors demand for holding a risky portfolio of shares compared with a risk-free security.

Thus the better presentation is:

$$k_E = r_f + \beta(RP)$$

$$k_E = 6 + 1.55(4.4) = 12.8\%$$

### Shifting risk-return relationships

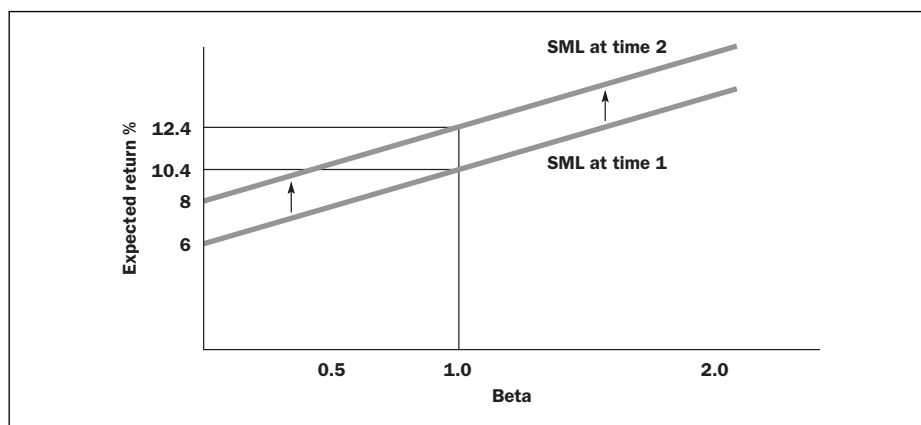
At any one time the position of the SML depends primarily on the risk-free rate of return. If the interest rate on government securities rises by say two percentage points the SML lifts upwards by 2 percent (see Figure 10.6).

### Risk premiums across the world

Table 10.2 shows estimates of the extra annual return received by investors for holding a portfolio of shares compared with government bonds over various time periods. It is clear that the extra return over periods as short as one year can give a distorted picture – we cannot possibly assume that the negative return on shares in 2002 represents the normal ‘additional’ return demand by investors above a risk-free investment. Notice that the risk premium received for holding shares rather than government bonds has generally been in the range of 3 percent to 6 percent for the 16 countries listed. This gives us a strong indication of the likely future risk premium demanded by investors today. Therefore using a risk premium in this range for cost of

**FIGURE 10.6**

**Shifts in the SML – a two percent point rise in the risk-free rate**





equity capital calculation could be defended on these grounds. But note the assumption you would be making: that the returns investors actually received after the event (e.g. over the twentieth century) reflect the return they would have been demanding before the event (e.g. start of the twentieth century) for investing in shares rather than bonds.

### Estimating some expected returns

To calculate the returns investors require from particular shares you need to obtain three numbers using the CAPM: (i) the risk-free rate of return,  $r_f$ , (ii) the

**TABLE 10.2**  
**Equity risk premiums**

	% per annum
<b>UK</b>	
101 years 1900–2000	4.4
51 years 1950–2000	6.8
31 years 1970–2000	3.5
1 year 2002 <sup>1</sup>	–29.2
<b>Other countries</b>	
Australia 101 years 1900–2000	6.3
Belgium 101 years 1900–2000	2.9
Canada 101 years 1900–2000	4.5
Denmark 101 years 1900–2000	2.0
France 101 years 1900–2000	4.9
Germany 99 years 1900–2000 <sup>2</sup>	6.7
Ireland 101 years 1900–2000	3.2
Italy 101 years 1900–2000	5.0
Japan 101 years 1900–2000	6.2
Netherlands 101 years 1900–2000	4.7
South Africa 101 years 1900–2000	5.4
Spain 101 years 1900–2000	2.3
Sweden 101 years 1900–2000	5.2
Switzerland 90 years 1911–2000	2.7
USA 101 years 1900–2000	5.0
World 101 years 1900–2000	4.6

<sup>1</sup> Dimson, Marsh and Staunton, personal communication.

<sup>2</sup> For Germany the years 1922–23 are excluded

Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton, NJ: Princeton University Press, 2002. The risk premiums presented are relative to government bonds rather than government bills.

risk premium for the market portfolio,  $(r_m - r_f)$ , and (iii) the beta of the share. In 2004 the returns on UK government securities are about 4 to 5 percent. For the purpose of illustration we will take a risk premium of 4.4 percent – the average (post-event) risk premium over 101 years. We have to acknowledge our imprecision at this point (even though some consultants will give a cost of equity capital to a tenth of a percentage point). Looking at the figures in Table 10.2 we could go for a risk premium of, say, 6.9 percent to reflect the fact that shares returned a much higher premium to UK investors in the last 51 years of the twentieth century. On the other hand, we could plump for a much lower figure if we accept the argument that investors were surprised by the size of the premium they actually received; they weren't demanding it *a priori*, it was just that the optimists (share investors) were lucky and got it anyway – see Shiller (2000) and Dimson, Marsh and Staunton (2002) for this view – in future they will get a smaller return above the government bond rate. Table 10.3 calculates the returns required on shares of some leading UK firms using beta as the only risk variable influencing returns.

**TABLE 10.3**  
**Returns expected by investors based on CAPM**

Share	Beta ( $\beta$ )	Expected returns
		$r_f + \beta(r_m - r_f)$
BOC	0.79	$6 + 0.79(4.4) = 9.5$
BT	1.62	$6 + 1.62(4.4) = 13.1$
Sainsburys (J)	0.80	$6 + 0.80(4.4) = 9.5$
GUS	0.97	$6 + 0.97(4.4) = 10.3$
Barclays Bank	1.11	$6 + 1.11(4.4) = 10.9$
Marks and Spencer	0.5	$6 + 0.50(4.4) = 8.2$

### Calculating beta

To make CAPM work for making decisions concerning the future it is necessary to calculate the *future* beta. That is, how more or less volatile a particular share is going to be relative to the market. Investors want extra compensation for relative volatility over the period when they hold the share – i.e. time still to come. Obviously, the future cannot be foreseen, and so it is difficult to obtain an estimate of the likely co-movements of the returns on a share and the market portfolio. One approach is to substitute subjective probability beliefs, but this has obvious drawbacks. The most popular method is to observe the historic relationship between returns and to assume that this co-variance will persist into the future.

Figure 10.7 shows a simplified and idealized version of this sort of analysis. Twelve monthly observations for, say, 2003 are shown (commercially supplied beta calculations are often based on at least 60 monthly observations stretching back over five years). Each plot point in Figure 10.7 expresses the return on the market index portfolio  $r_m$  for a particular month and the return on the specific shares  $r_j$  being examined in that same month.

In such an analysis the market portfolio will be represented by some broad index containing many hundreds of shares. In this highly idealized example the relative returns plot along a straight line referred to as the *characteristic line*. The example shown here is a perfect statistical relationship, there is no statistical ‘noise’ causing the plot points to be placed off the line. The characteristic line has a form described by the following formula

$$r_j = a + \beta_j r_m$$

where:

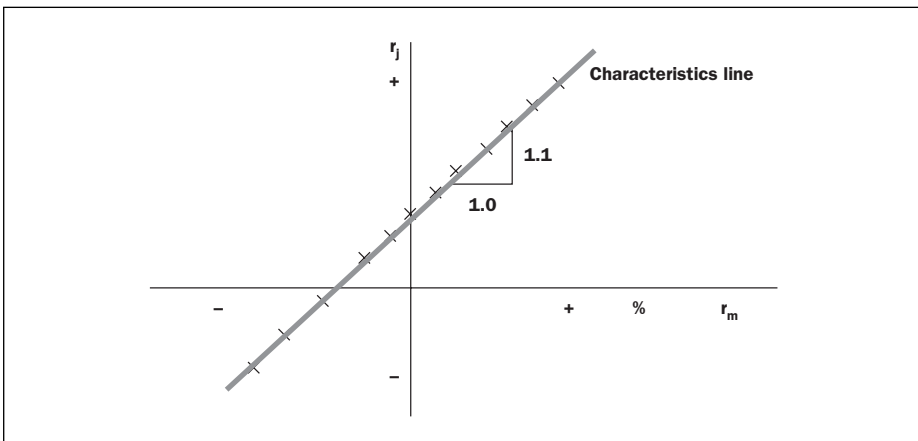
- $r_j$  = rate of return on the  $j$ th share
- $r_m$  = rate of return on the market index portfolio
- $a$  = alpha. The regression line intercept
- $\beta_j$  = the beta of security  $j$ .

The slope of the characteristic line is the beta for share  $j$ . That is:

$$\frac{\text{Change in } r_j}{\text{Change in } r_m} = \beta$$

In this case the slope is 1.1 and therefore  $\beta = 1.1$ .

**FIGURE 10.7**  
The characteristic line – no unsystematic risk



A more realistic representation of the relationship between the monthly returns on the market and the returns on a specific share are shown in Figure 10.8. Here very few of the plot points fall on the fitted regression line (the line of best fit). The reason for this scatter of points is because unsystematic risk effects in any one month may cause the returns on a specific share to rise or fall by a larger or smaller amount than it would if the returns on the market were the only influence. The slope of the best fit line is 1.2, therefore beta is 1.2.

### Gordon growth model method for estimating the cost of equity capital

The most influential model for calculating the cost of equity in the early 1960s (and one which is still used today) was created by Gordon and Shapiro (1956), and further developed by Gordon (1962). Suppose a company's shares priced at  $P$  produce earnings of  $E$  per share and pay a dividend of  $d$  per share. The company has a policy of retaining a fraction,  $b$ , of its earnings each year to use for internal investments. If the rate of return (discount or capitalization rate) required on shares of this risk class  $k_E$  then, under certain restrictive conditions, it can be shown that earnings, dividends and reinvestment will all grow continuously, at a rate of  $g = br$ , where  $r$  is the rate of return on the reinvestment of earnings, and we have:

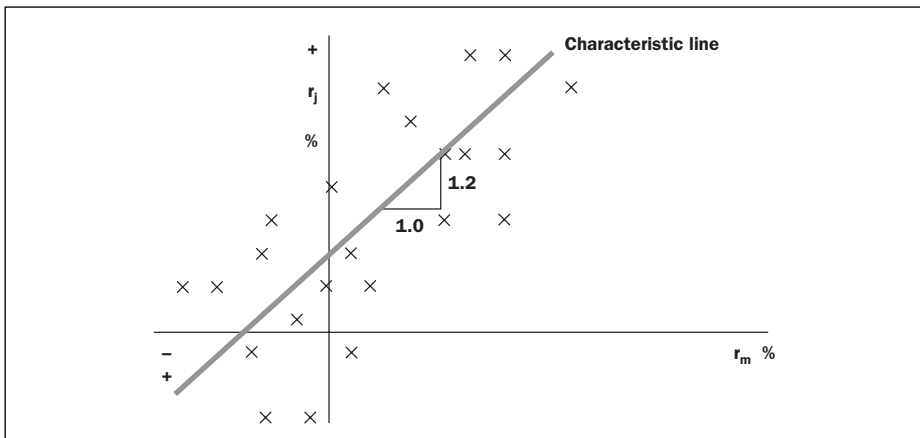
$$P = \frac{d_1}{k_E - g}$$

Solving for  $k_E$  we have:

$$k_E = \frac{d_1}{P} + g$$

where  $d_1$  is the dividend to be received next year.

**FIGURE 10.8**  
The characteristic line – with unsystematic risk



That is, the rate of return investors require on a share is equal to the prospective dividend yield *plus* the rate at which the dividend stream is expected to grow.

Gordon and Shapiro said that there are other approaches to the estimation of future dividends than the extrapolation of the current dividend on the basis of the growth rate explicit in  $b$  and  $r$ , so we can derive  $g$  in other ways and still the  $k_E$  formula remains valid,

A major problem in the practical employment of this model is obtaining a trustworthy estimate of the future growth rate of dividends to an infinite horizon. Gordon and Shapiro (1956) told us to derive this figure from known data in an objective manner, using common sense and with reference to the past rate of growth in a corporation's dividend. In other words, a large dose of judgment is required. The cost of equity capital under this model is very sensitive to the figure put in for  $g$ , and yet there is no reliable method of estimating it for the *future*, all we can do is make reasoned estimates and so the resulting  $k_E$  is based merely on an informed guess. Using past growth rates is one approach, but it means that it is assumed that the future growth of the company's earnings and dividends will be exactly the same as in the past – often an erroneous supposition. Professional analysts' forecasts could be examined, but their record of predicting the future is generally a poor one – especially for more than two years ahead. The rate of growth,  $g$ , is discussed further in Chapter 13, in the context of share valuation.

## The cost of retained earnings

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The most important source of long-term finance for most corporations is retained earnings. There are many large companies that rarely, if ever, go to their shareholders to raise new money, but rely on previous years' profits. There is a temptation to regard retained earnings as 'costless' because it was not necessary for the management to go out and persuade investors to invest by offering a rate of return.

However, retained earnings should be seen as belonging to the shareholders. They are part of the equity of the firm. Shareholders could make good use of these funds by investing in other firms and obtaining a return. These funds have an opportunity cost. We should regard the cost of retained earnings as equal to the expected returns required by shareholders buying new shares in a firm. There is a slight modification to this principle in practice because new share issues involve costs of issuance and therefore are required to give a marginally higher return to cover the costs of selling the shares.

## The cost of debt capital

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The cost of debt is generally determined by the following factors:

- the prevailing interest rates

- the risk of default
- the benefit derived from interest being tax deductible.

There are two types of debt capital. The first is debt that is traded, that is, bought and sold in a security market. The second is debt that is not traded.

### Traded debt

In the UK, bonds are normally issued by companies to lenders with a nominal value of £100. Vanilla bonds carry an annual coupon rate until the bonds reach maturity when the nominal or par value of £100 is paid to the lender (see Chapter 16 for more details). The rate of return required by the firm's creditors,  $k_D$ , is represented by the interest rate in the following equation which causes the future discounted cash flows payable to the lenders to equal the current market price of the bond  $P_D$ . We know the current price  $P_D$  of the bond in the market and the annual cash flow that will go to the lenders in the form of interest,  $i$ , and we know the cash to be received,  $R_n$ , when the bond is redeemed at the end of its life. The only number we don't yet have is the rate of return,  $k_D$ . This is found in the same way as the internal rate of return is found. (If IRR is alien to you, re-reading Chapter 2 may be beneficial.)

$$P_D = \sum_{t=1}^n \frac{i}{(1+k_D)^t} + \frac{R_n}{(1+k_D)^n}$$

where:

$i$  = annual nominal interest (coupon payment) receivable from year 1 to year  $n$ ;

$R_n$  = amount payable upon redemption;

$k_D$  = cost of debt capital (pre-tax).

$\sum_{t=1}^n$  means add up the results of all the  $\frac{i}{(1+k_D)^t}$  from next year (year 1) to the  $n$

number of years of the bond's life.

For example, Elm plc issued £100m of bonds six years ago carrying an annual coupon rate of 8 percent. They are due to be redeemed in four years for the nominal value of £100 each. The next coupon is payable in one year and the current market price of a bond is £93. The cost of this redeemable debt can be calculated by obtaining the internal rate of return, imagining that a new identical set of cash flows is being offered to the lenders from a new (four-year) bond being issued today. The lenders would pay £93 for such a bond (in the same risk class) and receive £8 per year for four years plus £100 at the end of the bond's life:

Year	0	1	2	3	4
	+£93	-£8	-£8	-£8	-£108

Thus the rate of return being offered is calculated from:

$$+93 - \frac{8}{1 + k_D} - \frac{8}{(1 + k_D)^2} - \frac{8}{(1 + k_D)^3} - \frac{108}{(1 + k_D)^4} = 0$$

With  $k_D$  at 11 per cent the discounted cash flow = + £2.307.

With  $k_D$  at 10 per cent the discounted cash flow = - £0.66.

Using linear interpretation the IRR can be found:

$$k_D = 10\% + \frac{0.66}{2.307 + 0.66} (11 - 10) = 10.22\%$$

The total market value of the bonds,  $V_D$ , is calculated as follows:

$$V_D = \text{£}100\text{m} \times \frac{\text{£}93}{\text{£}100} = \text{£}93\text{m}$$

We are concerned with finding the cost to a company of the various types of capital it might use to finance its investment projects, strategic plans, etc. It would be wrong to use the coupon rate of 8 percent on the bond. This was the required rate of return six years ago (assuming the bond was sold for £100). A rate of 10.22 percent is appropriate because this is the rate of return bond investors are demanding in the market today. The cost of capital is the best available return elsewhere for the bondholders for the same level of risk. Managers are charged with using the money under their command to produce a return at least equal to the opportunity cost. If the cash flows attributable to these lenders for a project or SBU are discounted at 8 percent then a comparison of the resulting net present value of the investment with the return available by taking the alternative of investing the cash in the capital markets at the same risk is not being made. However, by using 10.22 percent for the bond cost of capital we can compare the alternatives available to the lenders in the financial markets.

### Irredeemable bonds

The rate of return on irredeemable bonds (those that pay interest every year to an indefinite horizon) is easy. They have interest payments which form a perpetuity, therefore:

$$k_D = \frac{i}{P_D}$$

For example, a bond currently trading at £110 offering a £7 annual coupon is giving a rate of return of  $\text{£}7/\text{£}110 = 6.36$  percent.

### Tax effects

As explained earlier in the chapter, a firm is able to offset debt interest against a corporation tax liability. It is the cost of debt after the benefit of the tax shield

that is of interest to firms as this is the effective cost of this form of finance – assuming they have taxable profits which can be reduced by the interest charge.

In the calculation for Elm plc taxation has been ignored and so the above calculation of 10.22 percent should be properly defined as the cost of debt before tax,  $k_{\text{DBT}}$ . An adjustment is necessary to establish the true cost of the bond capital to the firm.

If  $T$  is the rate of corporate tax, 30 percent, then the cost of debt after tax,  $k_{\text{DAT}}$  is:

$$k_{\text{DAT}} = k_{\text{DBT}}(1 - T)$$

$$k_{\text{DAT}} = 10.22(1 - 0.30) = 7.15\%$$

### **A complication to be set aside in an introductory book**

We have calculated the yield to redemption on a very simple bond from first principles, to illustrate the key elements. In reality, most bonds offer coupon payments every six months – this complicates the type of analysis shown above. However, yields to redemption on bonds of different risk classes are available commercially, which avoids effort. The *Financial Times* displays the yields ('bid yield') offered on a range of frequently traded bonds of various risk classes (see 'Global Investment Grade' and 'High Yield and Emerging Market Bonds' tables). A useful website for bond yields is [www.ic-community.co.uk/bonds](http://www.ic-community.co.uk/bonds)

### **Untraded debt**

Most debt capital, such as bank loans, is not traded and repriced regularly on a financial market. We need to find the rate of interest that is the opportunity cost of lenders' funds – the current 'going rate' of interest for the risk class. The easiest way to achieve this is to look at the rate being offered on similar tradable debt securities.

### **Floating-rate debt**

Most companies have variable-rate debt in the form of either bonds or bank loans. Usually the interest payable is set at a margin over a benchmark rate such as bank base rate or LIBOR (see Chapter 15). For practical purposes the current interest payable can be taken as the before-tax rate of return ( $k_{\text{DBT}}$ ) because these rates are the market rates. There is a theoretical argument against this simple approach based on the difference between short- and long-term interest rates. For example, it may be that a firm rolls over a series of short-term loans – in this case the theoretically correct approach is to use the long-term interest rate.



## The cost of preference share capital

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Preference shares have some characteristics in common with debt capital (e.g. a specified annual payout of higher ranking than ordinary share dividends) and some characteristics in common with equity (dividends may be missed in some circumstances, and the dividend is not tax deductible) – see Chapter 17 for more details. If the holders of preference shares receive a fixed annual dividend and the shares are irredeemable the perpetuity formula may be used to value the security:

$$P_p = \frac{d_1}{k_p}$$

where  $P_p$  is the price of preference shares,  $d_1$  is the annual preference dividend,  $k_p$ , is the investors' required rate of return. Therefore, the cost of this type of preference share is given by:

$$k_p = \frac{d_1}{P_p}$$

## Hybrid securities

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Hybrid securities can have a wide variety of features – e.g. a convertible bond is a combination of a straight bond offering regular coupons and an option to convert the bond to shares in the company. It is usually necessary to calculate the cost of capital for each of the component elements separately. This can be complex and is beyond the scope of this chapter.

## Calculating the weights

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Book (accounting) values for debt, equity and hybrid securities should not be used in calculating the weighted average cost of capital. Market values should be used. For example if £100m was raised by selling perpetual bonds (coupons promised without a definite cease date) when interest rates were 5 percent, but these bonds now offer a 10 percent return and, therefore, are selling at half the original value, £50m, then this figure should be used in the weightings. The rationale for using market values is that we need to generate a return for the finance providers on the basis of their current contribution to the capital of the firm and in relation to the current opportunity cost – accounting values have little relevance to this. Investors in bonds right now are facing an opportunity cost of £50m (i.e. they could sell the bonds and release £50m of cash) so this is the figure that managers should see as the amount sacrificed by these finance providers, not the £100m that the bonds once traded at.

With equity capital it is correct to use the market capitalization figure (current share price multiplied by number of shares issued to investors). This is the amount that current investors are sacrificing to invest in this company today – the shares could be sold in the market-place at that value. The balance sheet value for equity shareholders funds is not relevant. It is likely to be very different to the market capitalization. Balance sheets consist of a series of historic accounting entries that bear little relation to the value placed on the shares by investors. Market capitalization figures are available in Monday editions of the *Financial Times* for quoted companies.

## The WACC with three or more types of finance

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The formula becomes longer, but not fundamentally more difficult when there are three (or more) types of finance. For example, if a firm has preference share capital as well as debt and equity the formula becomes:

$$\text{WACC} = k_E W_E + k_{\text{DAT}} W_D + k_p W_p$$

where  $W_p$  is the weight for preference shares.

The weight for each type of capital is proportional to market values – and, of course,  $W_E + W_D + W_p$  totals to 1.0.

## Classic error

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Managers are sometimes tempted to use the cost of the latest capital raised to discount projects, SBUs etc. This is wrong. Also do not use the cost of the capital you might be about to raise to finance the project.

The latest capital raised by a company might have been equity at, say, 12 percent, or debt at a cost of, say, 8 percent. If the firm is trying to decide whether to go ahead with a project that will produce an IRR of, say, 10.5 percent the project will be rejected if the latest capital-raising exercise was for equity and the discount rate used was 12 percent. On the other hand the project will be accepted if, by chance, the latest funds raised happen to be debt with a cost of 8 percent. The WACC should be used for all projects – at least, for all those of the same risk class as the existing set of projects. The reason is that a firm cannot move too far away from its optimum debt to equity ratio level. If it does its WACC will rise. So, although it may seem attractive for a subsidiary manager to promote a favored project by saying that it can be financed with borrowed funds and therefore it needs only to achieve a rate of return above the interest rate it must be borne in mind that the next capital-raising exercise after that will have to be for equity to maintain an appropriate financial gearing level.

## What about short-term debt?

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Short-term debt should be included as part of the overall debt of the firm when calculating WACC. The lenders of this money will require a return. However, to the extent that this debt is temporary or is offset by cash and marketable securities held by the firm it may be excluded.

## Applying the WACC to projects and SBUs

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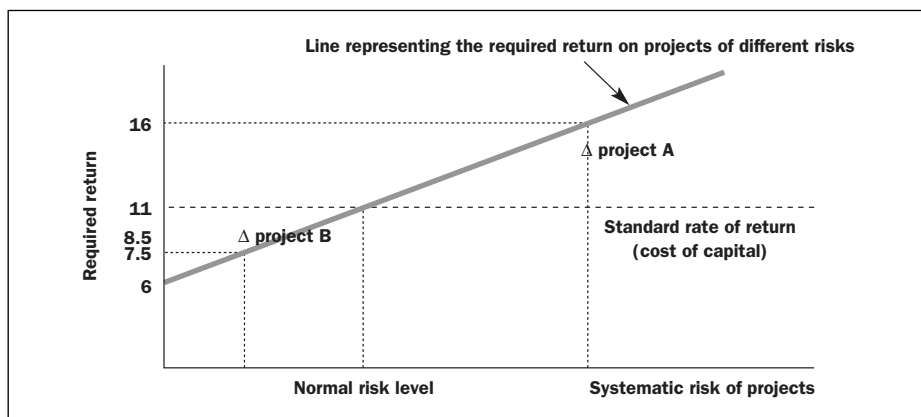
The overall return on the finance provided to a firm is determined by the portfolio of current projects. Likewise the risk (systematic) of the firm is determined by the collection of projects it is currently committed to. If a firm made an additional capital investment that has a much higher degree of risk than the average in the existing set then it is intuitively obvious that a higher return than the normal rate for this company will be required. On the other hand if an extraordinarily low risk activity is contemplated this should require a lower rate of return than usual.

Some multi-divisional firms make the mistake of demanding that all divisions achieve the same rate of return or better. This results in low risk projects being rejected when they should be accepted and high risk projects being accepted when they should be rejected.

Figure 10.9 is drawn up for an all-equity financed firm, but the principle demonstrated applies to firms financed by a mixture of types of capital. Given the firm's normal risk level the market demands a return of 11 percent. If another project is started with a similar level of risk then it would be reasonable to calculate NPV on the basis of a discount rate of 11 percent. This is the opportunity cost of capital for the shareholders – they could obtain 11 percent by investing their money in shares of other firms in a similar risk class. If however the firm invested in project A with a risk twice the normal level management would be doing their shareholders a disservice if they sought a mere 11 percent rate of return. At this risk level shareholders can get 16 percent on their money elsewhere. This sort of economic decision-making will result in projects being accepted when they should have been rejected. Conversely project B if discounted at the standard rate of 11 percent will be rejected when it should have been accepted. It produces a return of 8.5 percent when all that is required is a return of 7.5 percent for this risk class. It is clear that this firm should accept any project lying on or above the sloping line and reject any project lying below this line.

The rule discussed earlier (that a firm should accept any project that gives a return greater than the opportunity cost of capital) now has to be refined. This rule can only be applied if the marginal project has the same risk level as the existing set of projects. Projects with different risk levels require different levels of return.

Just how high the discount rate has to be is as much a matter for managerial judgment as it is based on the measures of risk and return developed by theo-

**FIGURE 10.9****Rates of return for projects of different systematic risk levels**

risks. The CAPM provides a starting point, a framework for thinking about risk premiums, but judging the viability of a project or division is still largely an art which requires experience and perceptive thought, not least because it is very difficult to quantify the likely risk of, say, a SBU developing an internet business. It may be possible to classify projects into broad categories say, high, medium and low, but precise estimation is difficult. What is clear is that the firm should not use a single discount rate for all its activities.

## What do managers actually do?

Academic literature promotes forcefully the use of the WACC. But to what extent have UK firms adopted the recommended methods? In 1983 Richard Pike expressed a poor opinion of the techniques used by businessmen to select the cost of capital: 'the methods commonly applied in setting hurdle rates are a strange mixture of folk-lore, experience, theory and intuition'. In 1976 Westwick and Shohet reported that less than 10 percent of the firms they studied used a WACC. The position has changed significantly over the last two decades. Arnold and Hatzopoulos (2000), in a study of 96 UK firms, found that the majority now calculate a WACC – see Table 10.4.

Despite years of academic expounding on the virtues of WACC and extensive managerial education, a significant minority of firms do not calculate a WACC for use in capital investment appraisal. Furthermore, as Tables 10.5 and 10.6 show, many firms that calculate a WACC do not follow the prescribed methods. Further evidence of a light grasp of textbook procedure was demonstrated in some of the statements made by respondents: 'Above is a minimum [WACC]. A hurdle rate is also used which is the mid-point of the above [WACC] and the lowest rate of return required by venture capitalists.' 'WACC + safety margin'

**TABLE 10.4**

**Replies to the question: How does your company derive the discount rate used in the appraisal of major capital investments? (percentage of respondents)**

Method used	Category of company			
	Small (%)	Medium (%)	Large (%)	Composite (%)
WACC	41	63	61	54
The cost of equity derived from the capital asset pricing model is used	0	8	16	8
Interest payable on debt capital is used	23	8	1	11
An arbitrarily chosen figure	12	4	3	6
Dividend yield on shares plus estimated growth in capital value of share	0	0	3	1
Earnings yield on shares	3	0	0	1
Other	12	8	11	10
Blank	9	8	5	7

Source: Arnold and Hatzopoulos (2000). The 'large' category represents the largest 100 companies in the UK as measured by capital employed. The 'medium-sized' companies are ranked between 250 and 400, and the 'small' firms are ranked 820–1000. The capital employed ranged between £1.3bn and £24bn for the large firms, £207m and £400m for the medium-sized firms and £40m and £60m for the small companies.

'Weighted average cost of capital plus inflation'.

**TABLE 10.5**

**Method of calculating the weighted average cost of capital (percentage of respondents that use WACC)**

Method	Category of company			
	Small (%)	Medium (%)	Large (%)	Composite (%)
Using the CAPM for equity and the market rate of return on debt capital	50	68	79	70
Cost of the equity calculated other than through the CAPM with the cost of debt derived from current market interest rates	50	32	18	29
Other	0	0	3	1

Source: Arnold and Hatzopoulos (2000)

**TABLE 10.6**

**If the weighted average cost of capital is used, then how are the weights defined? (percentage of respondents)**

Method of defining weights	Category of company			
	Small (%)	Medium (%)	Large (%)	Composite (%)
A long-term target debt and equity ratio	19	26	39	30
The present market values of debt and equity	44	47	42	44
Balance sheet ratios of debt and equity	37	26	19	26

Source: Arnold and Hatzopoulos (2000)

Gregory and Rutterford (1999) and Rutterford (2000) carried out a series of in-depth interviews with 18 FTSE-100 company finance directors or heads of corporate finance in 1996. They found that 14 of the companies made use of the capital asset pricing model to estimate the equity cost of capital, five used the dividend yield plus growth method (Gordon's growth model), four used the historic real rate of return on equity and five used more than one method.

### Risk-free rate and betas used

In terms of the risk-free rate most firms (12 out of 14 using the CAPM) used the yield on UK government bonds – they generally chose a bond with a maturity of between seven and 20 years. The remainder used a real (excluding inflation) rate of interest. None used the Treasury bill rate.

Betas were sourced from financial databases, such as that of the London Business School, or from financial advisers – most firms used more than one source. Many interviewees felt that any fine-tuning of the beta estimate would have less impact on the  $k_E$  estimate than would the choice of the equity risk premium.

### Risk premiums used

Two out of the 13 firms which estimated an equity risk premium chose a figure from a mid-1990s Barclays Capital Equity Gilt Study. This was based on a different time period to the study of Dimson, Marsh and Staunton. The Barclays studies published in the mid-1990s tracked returns from 1918 only rather than from January 1900 (the more recent Equity Gilt studies go back to 1900). The figures picked up by companies from these reports, at around 7.5 percent, are much higher than those used earlier in this chapter. The other 11 firms chose a number in a narrow range of 4.5 percent to 6 percent. The firms concerned admitted that

their estimates were a 'gut feel' choice 'that came from our planning manager. He's an MBA and a lot of his MBA work was on the cost of capital. Five percent is a figure he's plucked out of the air based on his experience and knowledge' (Company O: Gregory and Rutterford, 1999, p. 43). Alternatively, managers tended to rely on advice from their bankers that the current equity risk premium was lower than at any time in the past – this had the effect of reducing the WACC estimate by almost two percentage points (compared with using a risk premium of 7.5 percent) in most cases. This intuitive approach has subsequently been borne out by the downward revision of historic risk premiums in empirical studies.

### Cost of debt

All 11 firms that explicitly consider the cost of debt allowed for the corporate tax rate to reduce the effective cost. All the companies used the cost of long-term debt rather than the Treasury (three-month lending) rate advocated in some textbooks. The majority chose to base the cost of debt on the cost of government debt and either take this as the cost of debt or add a credit risk premium. Three companies took the yield on their own outstanding bonds and the remainder chose a long-term bond yield 'based on experience'. 'We do not put in our real cost of debt. There are certain, for example tax driven, vehicles which give us actually quite a low cost of debt . . . So we tend to ignore those. That does build up a nice margin of safety within the target (cost of capital) of course' (Company C: Gregory and Rutterford, 1999, p. 46).

### Debt/equity ratios

Ten out of 15 firms that calculated the WACC used a long-run target debt/equity ratio, five used the actual debt/equity ratio and one used both. For firms using a target ratio, this was taken as 20 percent, 25 percent or 30 percent, and was at least as high as the current actual debt/equity ratio, in some cases substantially higher – one firm with a cash surplus nevertheless chose a ratio of 20 percent.

Ten companies chose to estimate a nominal (including inflation) WACC (average value of 11.67 percent). Five used a real (excluding inflation) WACC (average value of 8.79 percent) and three used both a nominal and a real WACC. Rutterford (2000) comments: 'differences in data inputs for the equity risk premium (from 4 percent to 7.5 percent) and the choice of debt/equity ratio (from 0 percent to 50 percent) meant that the final WACC estimate was a fairly subjective estimate for each firm'.

### Hurdle rates

Corporations seem to make a distinction between WACC and the hurdle rate. Gregory and Rutterford found that the average *base* hurdle rate was 0.93 percent higher than the average WACC. The base hurdle rate is defined as the rate

for standard projects, before any adjustments for divisional differences in operating risk, financial risk or currency risk. Most of the firms had a range of hurdle rates, depending on project or the risk factors.

However, there was no consensus among the firms on how to adjust the differential project risk. Fourteen out of 18 made some adjustment for different levels of risk, with nine of those 14 making some adjustment for country risk or foreign exchange risk as well as for systematic risk. Note however that in 17 out of 18 cases the adjustment was made to the base hurdle rate and not to the more theoretically appropriate WACC. There was a general impression of sophistication in attaining the WACC in the first place, followed by a rule-of-thumb-type approach when making risk adjustments: 'The comment I make in terms of the hurdle rates for investment purposes is that we do it relatively simply in terms of low risk, high risk, country-specific risk' (Company P: Gregory and Rutterford, 1999, p. 53).

Methods range from adding two percentage point increments, to having two possible hurdle rates, say, 15 percent and 20 percent. Fifteen firms had premiums of 0 percent to 8 percent over the base hurdle rate, while three firms added more than ten percentage points for the highest-risk projects.

### **Some way to go yet**

Even when the textbook model is accepted a range of WACCs can be estimated for the same firm: 'for example, altering the choice of target debt/equity ratio or equity risk premium can have an impact of 2 percent or more on the resulting WACC figure. Furthermore, little work has yet been done to extend the complex analysis for the firm's WACC to the divisional level' (Rutterford, 2000, p. 149). This lack of sophistication was confirmed in another study, carried out by Francis and Minchington (2000) that discovered 24 percent of firms (of varied sizes) used a divisional cost of capital that reflects the cost of debt capital only significantly underestimating the cost of capital. Furthermore, 69 percent did not use a different rate for different divisions to reflect levels of risk.

## **Implementation issues**

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### **How large is the equity risk premium?**

To understand the controversy over the equity risk premium we need to appreciate that it can only ever be a subjective estimate. The reason for this is that we are trying to figure out how much additional annual return investors in an averagely risky share require above the risk-free rate today. Investors when deciding this are looking at the future, not the past. Each investor is likely to have a different assessment of the appropriate extra return compared with the risk-free investment. We need to assess the weighted average of investors' attitudes.



Using historical returns to see the size of the premium actually received may be a good starting point, but we must be aware that we are making a leap of faith to then assume that the past equity risk premium is relevant for today's analysis with its future focus. In using historic data we are making at least two implicit assumptions:

- there has been no systematic change in the risk aversion of investors over time,
- the index being used as a benchmark has had an average riskiness that has not altered in a systematic way over time.

### **Differing views**

Some City analysts believe that things have changed so radically in terms of the riskiness of ordinary shares for a fully diversified investor that the risk premium is now very small – some plump for 2 percent while extremists say that over the long run shares are no more risky than gilts, so say that the premium is zero. To justify their beliefs they point to the conquest of inflation, the lengthening of economic cycles, the long bull market (an argument weakened recently) and the increasing supply of risk capital as ageing industrial societies start to save more for retirement.

Even Barclays Capital dramatically revised the equity risk premium from over seven percentage points greater than gilts to around 4 percent. The Competition Commission tends to take a range of between 3.5 and 5 percent. OFWAT (the UK water industry regulator) prefers not to use historic premiums as they 'all significantly overstate the current expectations of actual equity investors'; OFWAT uses a range of between 3 and 4 percent. OFGEM (the UK gas and electricity regulator) states that a range of between 3 and 4.2 percent 'appears appropriate' (based on forward-looking averages of market predictions and average of past trends). Note that in their negotiating stance the regulators are likely to take a range that is as low as possible.<sup>5</sup>

### **An opinion**

In my view, equities have not become as safe as gilts. For equities the last two decades of the twentieth century were a charmed period. If long-term history is a guide shareholders will eventually learn the hard way that one can lose a great deal of money in stock markets. It is possible for returns to be negative for an entire decade or more. Turbulence and volatility will be as present in the twenty-first century as in the last. I believe the prudent investor needs to examine a long period of time, in which rare, but extreme, events have disrupted the financial system (wars, depressions, manias and panics) to gain an impression of the riskiness of shares.

What is clear is that obtaining the risk premium is not as scientific as some would pretend. The range of plausible estimates is wide and the effect of

choosing 2 percent rather than 4.4 percent, or even 7.5 percent can have a significant effect on the acceptance or rejection of capital investment projects within the firm, or the calculation of value performance metrics. One of the respondents to the Arnold and Hatzopoulos survey expressed the frustration of practitioners by pointing out that precision in the WACC method is less important than to have reliable basic data: 'The real issue is one of risk premium on equity. Is it 2% or 8%?!'

## Which risk-free rate?

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The risk-free rate is a completely certain return. For complete certainty two conditions are needed:

- the risk of default is zero,
- when intermediate cash flows are earned on a multi-year investment there is no uncertainty about reinvestment rates.

The return available on a zero coupon government bond<sup>6</sup> which has a time horizon equal to the cash flow (of a project, an SBU, etc.) being analyzed is the closest we are going to get to the theoretically correct risk-free rate of return.

Business projects usually involve cash flows arising at intervals, rather than all at the end of an investment. Theoretically, each of these separate cash flows should be discounted using different risk-free rates. So, for the cash flows arising after one year on a multi-year project, the rate on a one-year zero-coupon government bond should be used as part of the calculation of the cost of capital. The cash flows arising in year five should be discounted on the basis of a cost of capital calculated using the five-year zero-coupon rate and so on. However, this approach is cumbersome, and there is a practical alternative that gives a reasonable approximation to the theoretical optimum. It is considered acceptable to use a long-term government rate on all the cash flows of a project that has a long-term horizon. Furthermore, the return on a government bond with coupons, rather than a zero coupon bond, is generally taken to be acceptable. The rule of thumb seems to be to use the return available on a reputable government security having the same time horizon as the project under consideration – so for a short-term project one should use the discount rate which incorporates the short-term government security rate, for a 20-year project use the 20-year government bond yield-to-maturity.<sup>7</sup>

## How reliable is CAPM's beta?

There are many problems with the use of the CAPM's beta in the cost of equity capital calculation. We will consider two of them here:

### The use of historic betas for future analysis

The mathematics involved in obtaining an historic beta is straightforward enough; however it is not clear whether using weekly data is more appropriate than monthly, or whether the historical data on the returns on the market and the return on a particular share should be recorded over a one-, three-, five- or ten-year period. Each is likely to provide a different estimate of beta. Even if this is resolved the difficulty of using an historic measure for estimating a future relationship is very doubtful. Betas tend to be unstable over time. This was discovered as long ago as the early 1970s. Both Blume and Levy carried out extensive testing and discovered that the beta for a share tends to change significantly from one period to another. If the apparent risk on a share changes then the return that managers are required to obtain fluctuates unreasonably. If the requirement is to compensate investors for the risk class of the share they hold surely we need a measure of risk that is not volatile, otherwise managers will be rejecting projects in one year that they accept in another purely because of the different time period over which beta was measured (and whether weekly or monthly data are used). Table 10.7 gives an impression of the variability of the betas for some UK firms – some have been stable, while others have changed significantly.

**TABLE 10.7**

**Betas as measured for the five years to 1997, 2000 and 2004**

	1997	2000	2004
BOC	0.65	0.585	0.79
Barclays Bank	1.22	1.55	1.11
BT	0.91	0.94	1.62
GUS	0.59	0.39	0.97
Marks and Spencer	0.95	0.44	0.50
J. Sainsbury	0.60	0.19	0.80

Source: Datastream

One potential explanation for the shifting betas is that the risk of the security changes – firms change the way they operate and the markets they serve. A company that was relatively insensitive to general market change two years ago may now be highly responsive – but have the companies in Table 10.7 really changed the nature (riskiness) of their businesses that much over these periods? I doubt it. Alternatively, the explanation may lie in measurement error – large random errors cause problems in producing comparable betas from one period to another. To add to this problem we have a wide variety of market indices (such as FTSE-100, FTSE All Share) to choose from when calculating the historical co-variability of a share with the market (its beta).

### The breakdown in the relationship between beta and return

The fundamental point about the CAPM is that investors demand higher returns on shares that are more volatile relative to the market index. Investors require that a share with a beta of 1.5 should provide a higher return than a share with a beta of 1. When the model was first developed in the 1960s this was nothing more than an assertion based on theorizing. In the 1970s and 1980s tests were performed to see if, in practice, portfolios of shares having shown a high beta produce higher returns in future than portfolios of shares with a low beta. In theory, the returns on share portfolios with different betas would lie along the security market line (SML). So, if you purchased a portfolio made up of shares with a beta of 2.0 (historically these shares have been twice as volatile as the market) you would expect it to produce much higher returns over the next five years than a portfolio made up of shares that have shown a low beta in their historic relationship with market returns, say, a beta of 0.5. If beta is the only risk that investors care about (the nub of the CAPM) then this is the only factor for raising the equity cost of capital. If the historical evidence shows that investors have not received this extra return then one has to doubt whether beta risk is the only form of risk that investors require compensation for. And, if they don't require compensation for taking on this extra risk why should managers try to achieve higher returns for higher beta activities? So, are investors really bothered about beta risk?

The results of early studies generally showed a positive relationship between beta and subsequent returns. Investors got a higher return for bearing beta risk – it seems reasonable to presume that this is because they *demand*ed this premium. This demand was transmitted via the buying and selling of shares on the stock market. By influencing share prices investors influence returns – for shares with the same level of projected cash flows the high beta ones are bid down because investors are more reluctant to hold them.

However, the evidence of the early studies was not perfectly in support of the CAPM. The extent to which returns rose with beta was significantly less than the theoreticians expected. Low-risk shares tended to show rates of return higher than the theory would suggest, and high beta shares show lower returns than the CAPM predicts.

The debate moved in the late 1980s and 1990s to whether the CAPM and beta were any use at all. The question 'Is beta dead?' has caused heated debate in the academic world just at the time, ironically, of its greatest adoption by practitioners. Fischer Black (1993) discovered that while returns on US shares did vary in relation to beta in the period 1931–91, there appeared to be no relationship at all in the period 1966–91. His Portfolio 1 (consisting of those shares with the top 10 percent of betas, average beta of 1.50) showed the same return as portfolio 10 (average beta of 0.51).

The publication of Eugene Fama and Kenneth French's (1992) empirical study of US share returns over the period 1963–90 was a further blow to the

CAPM. They found ‘no reliable relation between  $\beta$  and average return’.<sup>8</sup> They continue: ‘The Sharpe-Lintner-Black model [CAPM] has long shaped the way academics and practitioners think about average return and risk ... In short, our tests do not support the most basic prediction of the SLB model, that average stock returns are positively related to market  $\beta$ s ... Our bottom-line results are: (a)  $\beta$  does not seem to help explain the cross-section of average stock returns, and (b) the combination of size and book-to-market equity [do].’ In other words, beta has not been able to explain returns whereas two other factors have. A firm’s total market value has had some effect on returns – the larger the firm the lower the return. Also the ratio of the firm’s book (balance sheet) value to its market value (total value of all shares issued) has had some explanatory power – if book value is high *vis-à-vis* market value then returns tend to be higher. This particular onslaught on CAPM has caused great consternation and reaction in the academic world.

Louis Chan and Josef Lakonishok (1993) breathed a little life into the now dying beta. They looked at share returns over the period 1926–91 and found a faint pulse of a relationship between beta and returns but were unable to show statistical significance because of the ‘noisy’ data. More vibrant life can be witnessed if the share return data after 1982 is excluded – but, then, shouldn’t it work in all periods? They also argued that beta may be a more valid determinant of return in extreme market circumstances, such as a stock market crash and therefore should not be written off as being totally ‘dead’.

Beta has been brought to its knees by the punches delivered by American researchers, it was kicked again while it was down by the damaging evidence drawn from the European share markets. For example Albert Corhay and co-researchers Gabriel Hawawini and Pierre Michel (1987) found that investors in stocks (shares) trading in the USA, the UK and Belgium were not compensated with higher average returns for bearing higher levels of risk (as measured by beta) over the 13-year sample period. Investors in stocks trading on the Paris Stock Exchange were actually penalized rather than rewarded – they received below average rates of return for holding stocks with above-average levels of risk. Strong and Xu (1997) show that for UK shares during the period 1973–92 displayed a *negative* relationship between average returns and beta!

It is plain that even if the CAPM is not dead, it has been severely wounded. Beta may or may not have some explanatory power for returns. That debate will rage for many years yet. What we can conclude from the evidence presented is that there appears to be more to risk than beta.

## Fundamental beta

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Instead of using historical betas calculated through a regression of the firm’s returns against a proxy for the market portfolio (eg. FTSE 100) some analysts calculate a ‘fundamental beta’. This is based on the intuitive underpinning of the

risk-return relationship: if the firm (or project) cash flows are subject to more (systematic) variability then the required return should be higher. What causes greater systematic variability? Three factors have been advanced:

- **The type of business that the company (SBU or project) is engaged in** Some businesses are more sensitive to market conditions than others. The turnover and profits of cyclical industries change a great deal with macro-economic fluctuations. So, for example, the sale of yachts, cars or designer clothes rises in a boom and crashes in decline. On the other hand, non-cyclical industries, such as food retailing or tobacco, experience less variability with the economic cycle. Thus, in a fundamental beta framework cyclical businesses would be allocated a higher beta than non-cyclical businesses. If the purchase of the product can be delayed for months, years or even indefinitely (i.e. it is discretionary) then it is more likely to be vulnerable to an economic downturn.
- **Degree of operating gearing** If the firm has high fixed costs compared with variable costs of production its profits are highly sensitive to output levels. A small percentage fall in output and revenue can result in a large percentage change in profits. The higher variability in profit means that a higher beta should be allocated.
- **Degree of financial gearing** If the company has high borrowings, with a concomitant requirement to pay interest regularly, then profits attributable to shareholders are likely to be more vulnerable to shocks. So the beta will rise if the company has higher financial gearing (or leverage). The obligation to meet interest payments increases the variability of after-interest profits. In a recession profits can more easily turn into losses. Financial gearing exacerbates the underlying business risk.

The obvious problem with using the fundamental beta approach is the difficulty of deriving the exact extent to which beta should be adjusted up or down depending on the strength of the three factors.

## Some thoughts on the cost of capital

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### Progress

There have been a number of significant advances in theory and in practice over the last 40 years. No longer do most firms simply use the current interest rate, or adjust for risk in an entirely arbitrary manner. There is now a theoretical base to build on, both to determine a cost of capital for a firm, and to understand the limitations (or qualities) of the input data and modeling.

It is generally accepted that a weighted average of the costs of all the sources of finance is to be used. It is also accepted that the weights are to be based on market values (rather than book values), as market values relate more closely to

the opportunity cost of the finance providers. Furthermore, it is possible that the WACC may be lowered and shareholder value raised by shifting the debt/equity ratio.

Even before the development of modern finance it was obvious that projects (or collections of projects, as firms are) that had a risk higher than that of investing in government securities require a higher rate of return. A risk premium must be added to the risk-free rate to determine the required return. However, modern portfolio theory (MPT) has refined the definition of risk, so the analyst need only consider compensation (additional return) for systematic risk.

### Outstanding issues

Despite the progress, considerable difficulties remain. Practitioners need to be aware of both the triumphs of modern financial theory as well as its gaps. The area of greatest controversy is the calculation of the cost of equity capital. In determining the cost of equity capital we start with the following facts.

- The current risk-free rate is the bedrock. It is acceptable to use the rate on a government bond with the same maturity as the project, SBU, etc.
- The return should be increased to allow for the risk of a share with average systematic risk. (Add a risk premium to the risk-free rate return.) As a guide, investors have received a risk premium of around 4 to 5 percent for accepting the risk level equivalent to that on the average ordinary share over the past 100 years.
- A particular company's shares do not carry average equity risk, therefore the risk premium should be increased or decreased depending on the company's systematic risk level.

So, if the project or SBU under examination has a systematic risk which is lower than that on the average share it would seem sensible that the returns attributable to shareholders on this project should be somewhere between the risk-free rate and the risk-free rate plus, say, 4.4 percent. If the project has a systematic risk greater than that exhibited by shares generally then the returns required for shareholders will be more than the risk-free rate plus, say, 4.4 percent.

The main difficulty is in calculating the systematic risk level. In the heyday of the CAPM this was simple: beta was all you needed. Today we have to allow for the possibility that investors want compensation for a multiplicity of systematic risk factors. Not unnaturally many business people are unwilling to adopt such a burdensome approach and fall back on their 'judgment' to adjust for the risk of a project. In practice it is extremely difficult to state precisely the riskiness of a project – we are dealing with future uncertainties about cash flows from day-to-day business operations subject to sudden and unforeseen shocks. The pragmatic approach is to avoid precision and simply place each proposed project into one of three risk categories: low, medium or high. This neatly bypasses the

complexities laid out by the theorists and also accurately reflects the fact that decisions made in the real world are made with less than complete knowledge. Mechanical decision-making within the firm based on over-simplistic academic models is often a poor substitute for judgment that recognizes the imperfections of reality.

One thing is certain: if anyone ever tells you that they can unequivocally state a firm's cost of capital to within a tenth of a percentage point, you know you are talking to someone who has not quite grasped the complexity of the issue.

## Conclusion

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A firm that asks an unreasonably high rate of return will be denying its shareholders wealth-enhancing opportunities and ceding valuable markets to competitors. One that employs an irrationally low cost of capital will be wasting resources, setting managers targets that are unduly easy to reach and destroying wealth.

This chapter has described the academic foundations (much of it Nobel prize winning) for calculating a company's cost of capital. It has also pointed out the practical difficulties of calculating real world discount rates. The difficulties are severe, but please don't throw your hands up and conclude that the economists and finance theorist have taken us on a long arduous road back to where we started. We are not at square one. We have a set of rules to provide a key management number. We now know that judgment is required at many stages in the process and where those particular points are. This allows us to view any number produced by our own calculations or those of the finance team, with the required amount of reasoned skepticism. And, when making decisions on whether to invest in that new factory or close down a division we have some grasp of the degree to which there is room for error in the value calculation. This part of the book reinforces that in this uncertain world we should think in terms of a range of possible outcomes, with all too imprecise subjective probabilities, not in terms of cut-and-dried pin-point precision. The arguments in this chapter should, I hope, allow you to estimate the boundaries for the range values you feel comfortable with. Returns falling below the acceptable range can be easily rejected, those with a good margin above are simple decisions. Management at these extremes is survivable even for the humdrum executive. Those projects that give returns lying in the middle require insightful judgment: that is the art of management and call for the leaders.

## Notes

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- 1 Quoted in Philip Coggan and Paul Cheeseright, *Financial Times*, 8 November 1994.
- 2 Modigliani and Miller did not ignore tax and financial distress in their work, but did down play them in the formulation of their early model.



- 3 This is assuming that future inflation is included in the projected cash flows. That is, we are using nominal cash flows and a nominal interest rate. An alternative method is to use real cash flows and a real discount rate (i.e. with inflation removed).
- 4 Other models of risk and return define systematic in other ways.
- 5 An excellent discussion of the calculation of the cost of capital by regulators is to be found in Lockett, M. (2001) Calculating the cost of capital for the regulated electricity distribution companies, Aston University MBA Project Dissertation and in a later paper: Lockett, M. (2002), Calculating the cost of capital for the regulated electricity distribution companies. *Power Engineering Journal*, October, pp. 251–63.
- 6 A zero-coupon bond is one that promises the owner a capital sum at the end of its life, say ten years down the line, but does not offer any income between now and then. These sell for much less than the amount promised at the end. So a ‘zero’ with ten years to run offering £100 on redemption might currently be selling for £40. As a holder you have no income, but you do receive a large capital gain.
- 7 Lockett (2002) describes the increasing popular approach of using the rate of return offered on a UK government index-linked gilt in a WACC calculation that is based on real rates of return and real cash flows. That is, with inflation removed from both. This would appear to be a method used by regulators such as OFGEM, OFWAT and the Competition Commission. This generally provides a figure of around 2.25–3.0 percent as the required return in the absence of inflation or risk. If you are conducting an analysis with actual projected cash flows (i.e. with inflation built into the assumptions) then you need to add an estimated inflation rate, which will take you back (approximately) to the rate on the conventional government bond of the same time to maturity.
- 8 There is some controversy over their interpretation of the data, but nevertheless this is a very serious challenge to the CAPM.

## MERGERS: IMPULSE, REGRET AND SUCCESS

Introduction

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The merger decision

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You say acquisition, I say merger

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Merger statistics

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What drives firms to merge?

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Do the shareholders of acquiring firms gain from  
mergers?

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Managing mergers

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Conclusion

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## Introduction

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The topic of mergers is one of those areas of finance that attracts interest from the general public as well as finance specialists and managers. There is nothing like an acrimonious bid battle to excite the press, where one side is portrayed as 'David' fighting the bullying 'Goliath', or where one national champion threatens the pride of another country by taking over a key industry. Each twist and turn of the campaign is reported on radio and television news broadcasts, and, finally, there is a victor and a victim. So many people have so much hanging on the outcome of the conflict that it is not surprising that a great deal of attention is given by local communities, national government, employees and trade unionists. The whole process can become emotional and over-hyped to the point where rational analysis is sometimes pushed to the side.

This chapter examines the reasons for mergers ranging from the gaining of economies of scale to managerial empire building. Then a major question is addressed: Do shareholders of acquiring firms gain from mergers? Evidence is presented which suggests that in less than one-half of corporate mergers do the shareholders of the acquiring firm benefit. To help the reader understand the causes of this level of failure the various managerial tasks involved in achieving a successful (that is, a shareholder wealth-enhancing) merger, including the 'soft' science issues, such as attending to the need to enlist the commitment of the newly acquired workforce, are discussed.

In the next chapter the merger process itself is described, along with the rules and regulations designed to prevent unfairness. Also discussed is the way in which mergers are financed.

## The merger decision

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Expanding the activities of the firm through acquisition involves significant uncertainties. Very often the acquiring management seriously underestimate the complexities involved in merger and post-merger integration.

Theoretically the acquisition of other companies should be evaluated on essentially the same criteria as any other investment decision, that is, using NPV. As Rappaport states: 'The basic objective of making acquisitions is identical to any other investment associated with a company's overall strategy, namely, to add value'.<sup>1</sup>

In practice, the myriad collection of motivations for expansion through merger, and the diverse range of issues such an action raises, means that mergers are usually extremely difficult to evaluate using discounted cash flow techniques. Consider these two complicating factors.

- The benefits from mergers are often difficult to quantify. The motivation may be to ‘apply superior managerial skills’ or to ‘obtain unique technical capabilities’ or to ‘enter a new market’. The fruits of these labors may be real, and directors may judge that the strategic benefits far outweigh the cost, and yet these are difficult to express in numerical form.
- Acquiring companies often do not know what they are buying. If a firm expands by building a factory here, or buying in machinery there, it knows what it is getting for its money. With a merger, information is often sparse – especially if it is a hostile bid in which the target company’s managers are opposed to the merger. Most of the value of a typical firm is in the form of assets which cannot be expressed on a balance sheet, for example the reservoir of experience within the management team, the reputation with suppliers and customers, competitive position and so on. These attributes are extremely difficult to value, especially from a distance, and when there is a reluctance to release information. Even the quantifiable elements of value, such as stock, buildings and free cash flow, can be miscalculated by an ‘outsider’.

## You say acquisition, I say merger

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Throughout this book the word merger will be used to mean the *combining of two business entities under common ownership*.

Many people, for various reasons, differentiate between the terms merger, acquisition and takeover – for example, for accounting and legal purposes. However, most commentators use the three terms interchangeably, and with good reason. It is sometimes very difficult to decide if a particular unification of two companies is more like a merger, in the sense of being the coming together of roughly equal-sized firms on roughly equal terms, in which the shareholders remain as joint owners and both teams of executives share the managerial duties, or whether the act of union is closer to what some people would say is an acquisition or takeover – a purchase of one firm by another with the associated implication of financial and managerial domination. In reality it is often impossible to classify the relationships within the combined entity as a merger or a takeover. The literature is full of cases of so-called mergers of equals that turn out to be a takeover of managerial control by one set of managers at the expense of the other.<sup>2</sup> Jürgen Schrempp, the chairman of DaimlerChrysler, shocked the financial world with his honesty on this point. At the time of the union of Chrysler with Daimler Benz in 1998 it was described as a merger of equals. However, in 2000 Schrempp said, ‘The structure we have now with Chrysler [as a standalone division] was always the structure I wanted. We had to go a round-about way but it had to be done for psychological reasons. If I had gone and said Chrysler would be a division, everybody on their side would have said: “There is no way we’ll do a deal.”’<sup>3</sup> Jack Welch, the well-respected industrialist, supports Schrempp: ‘This was a buy-out of Chrysler by Daimler. Trying to run it as a

merger of equals creates all kinds of problems ... There is no such thing as a merger of equals ... There has to be one way forward and clear rules.’<sup>4</sup> Lord Browne, chief executive of BP, following the mergers with Amoco and Arco, also has strong views on this subject: ‘There is a big cultural problem with mergers of equals ... in the end there has to be a controlling strain from the two companies.’<sup>5</sup> This book will use the terms merger, acquisition and takeover interchangeably.

## **Types of mergers**

Mergers have been classified into three categories: horizontal, vertical and conglomerate.

### **Horizontal**

In a horizontal merger two companies engaged in similar lines of activity are combined. Recent examples include the merger of Carlton with Granada to form ITV plc and Wm Morrison and Safeway. One of the motives advanced for horizontal mergers is that economies of scale can be achieved. But not all horizontal mergers demonstrate such gains. Another major motive is the enhancement of market power resulting from the reduction in competition. Horizontal mergers often attract the attention of government competition agencies such as the Office of Fair Trading and the Competition Commission in the UK.

### **Vertical**

Vertical mergers occur when firms from different stages of the production chain amalgamate. So, for instance, if a manufacturer of footwear merges with a retailer of shoes this would be a (downstream) vertical merger. If the manufacturer then bought a leather producer (an upstream vertical merger) there would be an even greater degree of vertical integration. The major players in the oil industry tend to be highly vertically integrated. They have exploration subsidiaries, drilling and production companies, refineries, distribution companies and petrol stations. Vertical integration often has the attraction of increased certainty of supply or market outlet. It also reduces costs of search, contracting, payment collection, advertising, communication and co-ordination of production. An increase in market power may also be a motivation: this is discussed later.

### **Conglomerate**

A conglomerate merger is the combining of two firms which operate in unrelated business areas. For example, Vivendi Universal, originally a water utility spent the late 1990s buying up companies in fields as diverse as film and music production and telecommunications. Some conglomerate mergers are motivated by risk reduction through diversification; some by the opportunity for cost reduction and improved efficiency. Others have more complex driving motivations – many of which will be discussed later.

## Merger statistics

The figures in Table 11.1 show that merger activity has occurred in waves, with peaks in the early 1970s, late 1980s, and late 1990s. The vast majority (over 95 percent) of these mergers were agreed ('friendly'), rather than opposed by the target (acquired) firm's management ('hostile'). Only a small, but often noisy, fraction enter into a bid battle stage. In the late 1990s shares became a more important means of payment as the stock market boomed. In the first part of the 1980s merger boom (1985–89) ordinary shares tended to be the preferred method of payment. However, after the October 1987 stock market decline there was a switch to cash. There was a similar pattern in the early 1970s: when share prices were on the rise (1970–72) shares were used most frequently. Following the collapse in 1973–74 cash became more common.

**TABLE 11.1**  
**UK merger activity, 1970–2002 (UK firms merging with UK firms)**

Year	Number of UK companies acquired	Expenditure (£m)	Method of payment		
			Cash (%)	Ordinary shares (%)	Preference shares and loan stock %
1970	793	1,122	22	53	25
1971	884	911	31	48	21
1972	1,210	2,532	19	58	23
1973	1,205	1,304	53	36	11
1974	504	508	68	22	9
1975	315	291	59	32	9
1976	353	448	72	27	2
1977	481	824	62	37	1
1978	567	1,140	57	41	2
1979	534	1,656	56	31	13
1980	469	1,475	52	45	3
1981	452	1,144	68	30	3
1982	463	2,206	58	32	10
1983	447	2,343	44	54	2
1984	568	5,474	54	33	13
1985	474	7,090	40	52	8
1986	842	15,370	26	57	17
1987	1,528	16,539	35	60	5

TABLE 11.1 (CONTINUED)

Year	Number of UK companies acquired	Expenditure (£m)	Method of payment		
			Cash (%)	Ordinary shares (%)	Preference shares and loan stock %
1988	1,499	22,839	70	22	8
1989	1,337	27,250	82	13	5
1990	779	8,329	77	18	5
1991	506	10,434	70	29	1
1992	432	5,939	63	36	1
1993	526	7,063	81	16	3
1994	674	8,269	64	34	2
1995	505	32,600	78	20	2
1996	584	30,457	63	36	1
1997	506	26,829	41	58	1
1998	635	29,525	53	45	2
1999	493	26,166	62	37	1
2000	587	106,916	38	61	1
2001	492	28,994	29	66	5
2002	430	25,236	70	26	4

Source: Office for National Statistics, *Financial Statistics*. © Crown Copyright 2001. Reproduced by the permission of the Controller of HMSO and the Office for National Statistics.

Note: The figures include all industrial and commercial companies (and financial institutions from 1995) quoted or unquoted which reported the merger to the press (small private mergers are excluded).

On a worldwide scale merger activity grew dramatically through the 1990s. In the early part of the decade the value of companies merging rarely totaled more than \$400bn during a year. However, in 1999 and 2000 a staggering \$3,300bn and \$3,500bn respectively was achieved – it has since subsided.

It is not entirely clear why merger activity has boom periods, but some relationships have been observed and ideas advanced: companies go through confident expansion phases organically (that is, by internal growth) and through acquisitions, as the economy prospers, and corporate profitability and liquidity are high; perhaps some managers become over-confident after a few good years, and, impatient with internal growth, decide to grow in big steps through acquisition. The hubris hypothesis and other managerial explanations of mergers are discussed in the next section.

## What drives firms to merge?

Firms decide to merge with other firms for a variety of reasons. Figure 11.1 identifies four classes of merger motives. This may not be complete but at least it helps us to focus.

**FIGURE 11.1**  
**Merger motives**

<b>Synergy</b>	<b>Bargain buying</b>	<b>Managerial motives</b>	<b>Third party motives</b>
<p>The two firms together are worth more than the value of the firms apart.</p> <ul style="list-style-type: none"> <li>• <math>PV_{AB} = PV_A + PV_B + \text{gains}</math></li> <li>• Market power</li> <li>• Economies of scale</li> <li>• Internalization of transactions</li> <li>• Entry to new markets and industries</li> <li>• Tax advantages</li> <li>• Risk diversification.</li> </ul>	<p>Target can be purchased at a price below the present value of the target's future cash flow when in the hands of new management.</p> <ul style="list-style-type: none"> <li>• Elimination of inefficient and misguided management</li> <li>• Under-valued shares.</li> </ul>	<ul style="list-style-type: none"> <li>• Empire building</li> <li>• Status</li> <li>• Power</li> <li>• Remuneration</li> <li>• Hubris</li> <li>• Survival: speedy growth strategy to reduce probability of being takeover target</li> <li>• Free cash flow: management prefer to use free cash flow for acquisitions rather than return it to shareholders.</li> </ul>	<ul style="list-style-type: none"> <li>• Advisers.</li> <li>• At the insistence of customers or suppliers.</li> </ul>

### Synergy

In the first column of Figure 11.1 we have the classic word associated with merger announcements – synergy. The idea underlying this is that the combined entity will have a value greater than the sum of its parts. The increased value comes about because of boosts to revenue and/or the cost base. Perhaps complementary skills or complementary market outlets enable the combined firms to sell more goods. Sometimes the ability to share sources of supply or production facilities improves the competitive position of the firm. Some of the origins of synergy are listed in the figure. Before discussing these we will look at the concept of synergy in more detail.

If two firms, A and B, are to be combined a gain may result from synergistic benefits to provide a value above that of the present value of the two independent cash flows:

$$PV_{AB} = PV_A + PV_B + \text{gains}$$

where:

$$PV_A = \text{discounted cash flows of company A;}$$

$$PV_B = \text{discounted cash flows of company B;}$$

$$PV_{AB} = \text{discounted cash flows of the merged firm.}$$

Synergy is often expressed in the form  $2 + 2 = 5$ .



Value is created from a merger when the gain is greater than the transaction costs. These usually comprise advisers' fees, underwriters' fees, legal and accounting costs, stock exchange fees, public relations bills and so on. So if we assume that A and B as separate entities have present values of £20m and £10m respectively, the transaction costs total £2m and the value of the merged firms is £40m (£42m before paying transaction costs), then the net (after costs) gain from merger is £10m:

$$£40m = £20m + £10m + \text{gain}$$

But who is going to receive this extra value? The incremental value may be available for the acquirer or the target, or be split between the two. If company A is the acquirer, it might pay a price for B which is equal to the PV of B's cash flows (£10m), in which case all of the gain from the merger will accrue to A. However, this is highly unlikely. Usually an acquiring firm has to pay a price significantly above the pre-bid value of the target company to gain control – this is called the acquisition premium, bid premium or control premium.

If it is assumed that before the bid B was valued correctly on the basis of its expected future cash flows to shareholders then the bid premium represents the transferring of some of the gains to be derived from the created synergy. For example, if A paid £15m for B (and absorbed the £2m of costs) then B's shareholders receive £5m of the gain. If A has to pay £20m to acquire B then A receives no gain.

In 2000 Royal Bank of Scotland (RBS) paid £20.7bn to take over NatWest. Prior to the bidding period NatWest was valued at £16bn (market capitalization). RBS expected to make annualized revenue gains of £120m – by 2001 it had delivered £147m. It promised that £550m of annualized cost savings would be made – it found £653m of savings. Qualitative benefits were greater than expected. NatWest gained retail and corporate customers, and customer complaints were down by 15 percent. Even allowing for the 'costs of integration' of £1.6bn, RBS is confident that it has generated shareholder value from the deal.

Also, note another possibility known as the 'winner's curse' – the acquirer pays a price higher than the combined present value of the target and the potential gain. The winner's curse is illustrated by Marks & Spencer's overpaying for Brooks Brothers (*see* Exhibit 11.1).

## Market power

One of the most important forces driving mergers is the attempt to increase market power. This is the ability to exercise some control over the price of the product. It can be achieved through either (a) monopoly, oligopoly or dominant producer positions, etc., or (b) collusion.

If a firm has a large share of a market it often has some degree of control over price. It may be able to push up the price of goods sold because customers have few alternative sources of supply. Even if the firm does not control the entire market, a reduction in the number of participating firms to a handful makes

## Burnt fingers prompt painful exit from US

**M&S plans to return to the international market. But investors will hope it has learnt from its past, writes Susanna Voyle**

M&S's attempts to become an international retailer – stretching back decades – have done little other than waste investor money and distract management from the core UK business. A study of the moves shows a trail of ego-driven deals, muddled strategic thinking and overpayment for assets.

Brooks Brothers, sold yesterday for less than a third of its purchase price 13 years after it was bought, is a perfect case in point.

The iconic US suit retailer, with its select band of Ivy League shoppers, never really sat comfortably within M&S and failed to flourish in spite of heavy investment.

'It was not just wrong to buy it at that price,' said one former M&S executive involved in the deal, 'it was wrong to buy it, full stop.' ...

Towards the end of 1986, M&S chairman Lord Rayner sent a small group of trusted staff to the US to identify whether the M&S brand would translate to the American market. The team, led by Alan Smith, now chairman of Mothercare, quickly decided that the answer was no.

M&S had already been burnt by an unsuccessful foray into the Canadian market that then-chairman Lord Sieff blamed on a failure to study the market properly before entry.

But Lord Rayner was set on entering the US and asked Mr Smith and his team to identify possible small acquisitions that could be used as a toe in the water.

The plan was to buy one small clothing business and one small food chain.

'Rayner was determined to trade in America because he saw the globalisation of retailing ahead of him and thought that if he didn't learn how to do it M&S would be eaten up,' said one man who worked with both Lord Rayner and Mr Smith at the time.

However, when Lord Rayner was presented with a list of about six potential targets, he rejected it because Brooks was not included and he had set his eye on the chain.

Lord Rayner then approached Robert Campeau, the Canadian businessman who owned Brooks. He had acquired it under the highly leveraged Allied Stores deal, but he refused to sell.

The next year, however, when he was working to buy Federated Department Store and needed some capital, he returned to Lord Rayner and offered him the chain for \$750m. Lord Rayner, advised by NM Rothschild and Warburgs, jumped at the opportunity without haggling over the price.

Although a few voices within M&S tried to persuade him that he was overpaying, he drove the sale through in the typically autocratic style of many M&S chairmen. 'It was very much the triumph of one man's vision and ambition,' said a person who worked on the deal.

'He said the cultures were identical and liked its distinctive brand position. But really, it came down to the fact that he shopped there and liked it.' ...

### EXHIBIT 11.1 Burnt fingers

Source: *Financial Times* 24/25 November 2001

collusion easier. Whether openly or not, the firms in a concentrated market may agree among themselves to charge customers higher prices and not to undercut each other. The regulatory authorities are watching out for such socially damaging activities and have fined a number of firms for such practices, for example in the cement, vitamins and chemicals industries.

Market power is a motivator in vertical as well as horizontal mergers. Downstream mergers are often formed in order to ensure a market for the acquirer's product and to shut out competing firms. Upstream mergers often lead to the raising or creating of barriers to entry or are designed to place competitors at a cost disadvantage.

Even conglomerate mergers can enhance market power. For example, a conglomerate may force suppliers to buy products from its different divisions under the threat that it will stop buying from them if they do not comply. It can also support each division in turn as it engages in predatory pricing designed to eliminate competitors. Or it may insist that customers buy products from one division if they want products from another.

According to the European Commission, General Electric, in trying to merge with Honeywell, was attempting to put competitors at a disadvantage. In the end the Competition Commissioner blocked the bid, much to the annoyance of GE and US politicians, including George W. Bush – see Exhibit 11.2.

## GE to face call for Gecas separation

### European Commission sees aircraft leasing arm as possible obstacle to Honeywell deal

Deborah Hargreaves

The European Commission is expected to press General Electric to separate the accounts and management of Gecas, its aircraft leasing arm, as a condition of giving the go-head to its \$41bn (£29bn) deal to buy Honeywell.

The Commission is also believed to be looking for some divestment of part of Honeywell's avionics business and its regional jet engines business . . .

Gecas offers aircraft financing, leasing and fleet management. Brussels has been concerned about GE's ability to bundle products when offering equipment to airlines – for example, by offering a cheaper engine if an airline agrees to take Honeywell avionics – and

its use of Gecas' market power to kit out airlines with GE products.

The Commission's statement of objections to the deal says: 'Gecas is therefore used by GE to influence the outcome of airlines' airframe purchasing decisions and act as a promoter of GE-powered airframes to the detriment of GE's engine manufacturer competitors and eventually results, through the use of its disproportionate power, in excluding competing engine sales.'

Gecas will specify the use of a GE engine in aircraft it wants buy. Brussels is worried that the leasing arm will do the same for Honeywell's avionics and other aircraft equipment.

## EXHIBIT 11.2 GE to face call for Gecas separation

Source: *Financial Times*, 6 June 2001

## Economies of scale

An important contributor to synergy is the ability to exploit economies of scale. Larger size often leads to lower cost per unit of output. Rationalizing and consolidating manufacturing capacity at fewer, larger sites can lead to economies of production utilizing larger machines. Economies in marketing can arise through the use of common distribution channels or joint advertising. There are also economies in administration, research and development and purchasing.

Even with mergers of the conglomerate type managers claim achievable economies of scale. They identify savings from the sharing of central services such as administrative activities and accounting. Also the development of executives might be better at a large firm with a structured program of training and access to a wider range of knowledgeable and experienced colleagues. Financial economies, such as being able to raise funds more cheaply in bulk, are also alluded to.

Many businesses possess assets such as buildings, machinery or people's skills that are not used to their full limits. For example, banks and building societies own high street sites. In most cases neither the buildings nor the employees are being used as intensively as they could be. Hence we have one of the motivating forces behind bank and building society mergers. Once a merger is completed, a number of branches can be closed, to leave one rather than two in a particular location. Thus the customer flow to the remaining branch will be, say, doubled, with the consequent saving on property and labor costs.

Another synergistic reason for financial service industry mergers is the ability to market successful products developed by one firm to the customers of the other. Also when two medium-sized banks or building societies become large, funds borrowed on the capital market are provided at a lower cost per unit of transaction and at lower interest rates.

Case study 11.1 on the oil industry demonstrates the importance of even greater size in an industry that already had giants.

### Case study 11.1

#### Economies of scale in oil

Around the turn of the millennium there was a great deal of merger activity in the oil industry. Exxon and Mobil merged; as did Chevron and Texaco; Total, Fina and Elf; and B.P., Amoco and Arco, to name a few. The financial markets encouraged the trend, seeing the benefits from economies of scale. Greater size allows the possibility of cutting recurring costs, particularly in overlapping infrastructure. It also means access to cheaper capital. However, the most important advantage it gives is the ability to participate in the difficult game of twenty-first-century exploration and production. The easily accessible oil of the world has long been tapped. Today's oil companies have to search in awkward places like the waters off West Africa and China. The capital costs are enormous and risks are high. Only large companies can put up the required money and absorb the risk of a series of failed explorations. In addition, bigger oil companies have more political clout, particularly in George W. Bush's Washington, but also in developing country capitals around the world.

## Internalization of transactions

By bringing together two firms at different stages of the production chain an acquirer may achieve more efficient co-ordination of the different levels. The focus here is on the costs of communication, the costs of bargaining, the costs of monitoring contract compliance and the costs of contract enforcement. Vertical integration reduces the uncertainty of supply or the prospect of finding an outlet. It also avoids the problems of having to deal with a supplier or customer in a strong bargaining position. Naturally, the savings have to be compared with the extra costs that may be generated because of the loss of competition between suppliers – managers of units may become complacent and inefficient because they are assured of a buyer for their output.

Across Europe the heavy building materials industry is vertically integrated. The manufacturers of cement also own ready-mix concrete divisions and/or aggregates businesses. 'Cement represents the main cost item in the production of ready mix concrete, so there are powerful incentives for ready mix suppliers to secure access to supplies of cement to add to their existing supplies of aggregates.'<sup>6</sup>

## Entry to new markets and industries

If a firm has chosen to enter a particular market but lacks the right know-how, the quickest way of establishing itself may be through the purchase of an existing player in that product or geographical market. To grow into the market organically, that is, by developing the required skills and market strength through internal efforts alone, may mean that the firm, for many years, will not have the necessary critical size to become an effective competitor. During the growth period losses may well be incurred. Furthermore, creating a new participant in a market may generate over-supply and excessive competition, producing the danger of a price war and thus eliminating profits. An example of a market-entry type of merger is Cadbury Schweppes' takeover of Adams in the USA. As a result Cadbury quickly established a position in the gum (Stimorol/Trident/Dentyne chewing gum) and cough sweet (Hall's) markets and captured an effective distribution operation without creating additional capacity.

Many small firms are acquired by large ones because they possess particular technical skills. The small firm may have a unique product developed through the genius of a small team of enthusiasts, but the team may lack the interest and the skills to produce the product on a large scale, or to market it effectively. The purchaser might be aware that its present range of products are facing a declining market or are rapidly becoming obsolescent. It sees the chance of applying its general managerial skills and experience to a cutting-edge technology through a deal with the technologically literate enthusiasts. Thus the two firms are worth more together than apart because each gains something it does not already have. Many biotechnology companies have been bought by pharmaceutical giants for this reason.

Another reason for acquiring a company at the forefront of technology might be to apply the talent, knowledge and techniques to the parent company's existing and future product lines to give them a competitive edge. Consider the Daewoo purchase of Lotus (*see* Exhibit 11.3).

### Daewoo ready to pay premium for Lotus

Daewoo, the Korean industrial group, is poised to pay a substantial premium to acquire Group Lotus, the UK sports car and engineering concern.

Daewoo urgently needs to double its motor vehicle engineering staff to 8,000. It has been determined to outbid other potential investors in the financially pressed UK concern to gain access to the 1,000-strong engineering staff at Lotus, considered among the world's most talented.

Daewoo is keen to expand its design and engineering capabilities to rush into production the much wider vehicle range needed to meet its ambitious target of joining the world's top 10 car makers ...

Daewoo is expected to pay some \$75m (£48m) to Mr Romano Artioli, the Italian entrepreneur and current owner of Lotus.

#### EXHIBIT 11.3 Daewoo ready to pay premium for Lotus

Source: *Financial Times*, 1 October 1996

### Tax advantages

In some countries, notably the USA, if a firm makes a loss in a particular year, this can be used to reduce taxable profit in a future year. More significantly, for this discussion about mergers, not only can past losses be offset against current profits within one firm in one line of business, past losses of an acquired subsidiary can be used to reduce present profits of the parent company and thus lower tax bills. There is an incentive to buy firms which have accumulated tax losses.

In the UK the rules are more strict. The losses incurred by the acquired firm before it becomes part of the group cannot be offset against the profits of another member of the group. The losses can only be set against the future profits of the acquired company. Also that company has to continue operating in the same line of business.

### Risk diversification

One of the primary reasons advanced for conglomerate mergers is that the overall income stream of the holding company will be less volatile if the cash flows come from a wide variety of products and markets. At first glance the pooling of unrelated income streams would seem to improve the position of shareholders. They obtain a reduction in risk without a decrease in return.

The problem with this argument is that investors can obtain the same risk reduction in an easier and cheaper way. They could simply buy a range of shares in the independent separately quoted firms. In addition, it is said that conglomerates lack focus – with managerial attention and resources being dissipated.

A justification on more solid theoretical grounds runs as follows. A greater stability of earnings will appeal to lenders, thus encouraging lower interest rates. Because of the reduced earnings volatility there is less likelihood of the firm producing negative returns and so it should avoid defaulting on interest or principal payments. The other group that may benefit from diversification is individuals who have most of their income eggs in one basket – that is, the directors and other employees.

### **Bargain buying**

The first column of Figure 11.1 (see p. 259) deals with the potential gains available through the combining of two firms' trading operations. The second column shows benefits which might be available to an acquiring company which has a management team with superior ability, either at running a target's operations, or at identifying undervalued firms which can be bought at bargain prices.

### **Inefficient management**

If the management of Firm X is more efficient than the management of Firm Y then a gain could be produced by a merger if X's management is dominant after the unification. Inefficient management may be able to survive in the short run but eventually the owners will attempt to remove them by, say, dismissing the senior directors and management team through a boardroom coup. Alternatively the shareholders might invite other management teams to make a bid for the firm, or simply accept an offer from another firm that is looking for an outlet for its perceived surplus managerial talent.

A variation on the above theme is where the target firm does have talented management but they are directing their efforts in their own interests and not in the interests of shareholders. In this case the takeover threat can serve as a control mechanism limiting the degree of divergence from shareholder wealth maximization.

### **Undervalued shares**

Many people believe that stock markets occasionally underestimate the true value of a share. It may well be that the potential target firm is being operated in the most efficient manner possible and productivity could not be raised even if the most able managerial team in the world took over. Such a firm might be valued low by the stock market because the management are not very aware of the importance of a good stock market image. Perhaps they provide little infor-

mation beyond the statutory minimum and in this way engender suspicion and uncertainty. Investors hate uncertainty and will tend to avoid such a firm. On the other hand, the acquiring firm might be very conscious of its stock market image and put considerable effort into cultivating good relationships with the investment community.

In many of these situations the acquiring firm has knowledge which goes beyond that which is available to the general public. It may be intimately acquainted with the product markets, or the technology, of the target firm and so can value the target more accurately than most investors. Or it may simply be that the acquirer puts more resources into information searching than anyone else. Alternatively they may be insiders, using private information, and may buy shares illegally.

### **Managerial motives**

The reasons for merger described in this section are often just as rational as the ones which have gone before, except, this time, the rational objective may not be shareholder wealth maximization.

One group which seems to do well out of merger activity is the management team of the acquiring firm. When all the dust has settled after a merger they end up controlling a larger enterprise. And, of course, having responsibility for a larger business means that the managers *have* to be paid a lot more money. Not only must they have higher monthly pay to induce them to give of their best, they must also have enhanced pension contributions and myriad perks. Being in charge of a larger business and receiving a higher salary also brings increased status. Some feel more successful and important, and the people they rub shoulders with tend to be in a more influential class.

As if these incentives to grow rapidly through mergers were not enough, some people simply enjoy putting together an empire – creating something grand and imposing gives a sense of achievement and satisfaction. To have control over ever-larger numbers of individuals appeals to basic instincts: some measure their social position and their stature by counting the number of employees under them. Warren Buffett comments, ‘The acquisition problem is often compounded by a biological bias: many CEO’s attain their positions in part because they possess an abundance of animal spirits and ego. If an executive is heavily endowed with these qualities – which, it should be acknowledged, sometimes have their advantages – they won’t disappear when he reaches the top. When such a CEO is encouraged by his advisors to make deals, he responds much as would a teenage boy who is encouraged by his father to have a normal sex life. It’s not a push he needs.’<sup>7</sup>

John Kay points out that many managers enjoy the excitement of the merger process itself:



For the modern manager, only acquisition reproduces the thrill of the chase, the adventures of military strategy. There is the buzz that comes from the late-night meetings in merchant banks, the morning conference calls with advisers to plan your strategy. Nothing else puts your picture and your pronouncements on the front page, nothing else offers so easy a way to expand your empire and emphasise your role.<sup>8</sup>

Exhibit 11.4 reproduces an article about a company which seems to have suffered from a badly executed merger strategy.

### Weaning Simon off an addiction

Colleagues of Mr Maurice Dixon say his hair was already white when he became chief executive of Simon Engineering.

What is surprising is that he has any hair at all, given the difficulties facing the storage, process engineering and mobile platform group.

For Mr Dixon, turning Simon round has been like trying to rehabilitate a drug addict. When he arrived three years ago, he found himself in charge of an acquisition junkie that had spent £124.4m on often unrelated businesses.

To feed that habit, Simon had run up debts of £145.3m and had breached its

banking covenants. Sales halved to £386.1m between 1989 and 1993 – the year in which losses reached £160.3m.

‘When I arrived this company had about £10m of net worth and almost £150m of debt. It was a great big mess,’ recalls Mr Dixon.

Three years into the treatment, Simon has been weaned off acquisitions and made more than a dozen disposals, raising some £40m.

It has abandoned the flawed diversification strategy and refocused on three core divisions: Simon Storage, Carves – mainly process engineering – and Access, making mobile platforms.

#### Exhibit 11.4 Weaning Simon off an addiction

Source: *Financial Times*, 12 November 1996

These first four managerial motives for merger – empire building, status, power and remuneration – can be powerful forces impelling takeover activity. But, of course, they are rarely expressed openly, and certainly not shouted about during a takeover battle.

### Hubris

The fifth reason, hubris, is also very important in explaining merger activity. It may help particularly to explain why mergers tend to occur in greatest numbers when the economy and companies generally have had a few good years of growth, and management are feeling rather pleased with themselves.

Richard Roll in 1986 spelt out his hubris hypothesis for merger activity. Hubris means over-weaning self-confidence, or less kindly, arrogance. Managers commit errors of over-optimism in evaluating merger opportunities due to excessive pride or faith in their own abilities. The suggestion is that some acquirers do not learn from their mistakes and may be convinced that they can

see an undervalued firm when others cannot. They may also think that they have the talent, experience and entrepreneurial flair to shake up a business and generate improved profit performance (*see* Exhibit 11.5).

### On toads and princesses

Many managements apparently were overexposed in impressionable childhood years to the story in which the imprisoned handsome prince is released from the toad's body by a kiss from the beautiful princess. Consequently, they are certain that the managerial kiss will do wonders for the profitability of Company T(arget). Such optimism is essential. Absent that rosy view, why else should the shareholders of Company A(cquisitor) want to own an interest in T at the 2X takeover cost rather than at the X market price they

would pay if they made direct purchases on their own? In other words, investors can always buy toads at the going price for toads. If investors instead bankroll princesses who wish to pay double for the right to kiss a toad, those kisses had better pack some real dynamite. We've observed many kisses, but very few miracles. Nevertheless, many managerial princesses remain serenely confident about the future potency of their kisses – even after their corporate backyards are knee-deep in unresponsive toads.

#### EXHIBIT 11.5 Warren Buffett on hubris

Source: Berkshire Hathaway, Annual Report, 1981. Reprinted by kind permission of Warren Buffett. © Warren Buffett.

Note that the hubris hypothesis does not require the conscious pursuit of self-interest by managers. They may have worthy intentions but can make mistakes in judgment.

### Survival

It has been noticed by both casual observers and empiricists that mergers tend to take place with a large acquirer and a smaller target. Potential target managements may come to believe that the best way to avoid being taken over, and then sacked or dominated, is to grow large themselves, and to do so quickly. Mergers can have a self-reinforcing mechanism or positive feedback loop – the more mergers there are, the more vulnerable management feel and the more they are inclined to carry out mergers. Firms may merge for the survival of the management team and not primarily for the benefit of shareholders.

### Free cash flow

Free cash flow is defined as cash flow in excess of the amount needed to fund all projects that have positive NPVs. In theory, firms should retain money within the firm to invest in any project which will produce a return greater than the investors' opportunity cost of capital. Any cash flow surplus to this should be returned to shareholders (*see* Chapter 14).

However Jensen (1986) suggests that managers are not always keen on simply handing back the cash which is under their control. This would reduce their power. Also, if they needed to raise more funds the capital markets will require justification concerning the use of such money. So instead of giving shareholders free cash flow the managers use it to buy other firms. Peter Lynch is more blunt: '[I] believe in the bladder theory of corporate finance, as propounded by Hugh Liedtke of Pennzoil: The more cash that builds up in the treasury, the greater the pressure to piss it away.'<sup>9</sup>

## Third party motives

### Advisers

There are many highly paid individuals who benefit greatly from merger activity. Advisers charge fees to the bidding company to advise on such matters as identifying targets, the rules of the takeover game, regulations, monopoly references, finance, bidding tactics, stock market announcements, and so on. Advisers are also appointed to the target firms.

Other groups with a keen eye on the merger market include accountants and lawyers. Exhibit 11.6 gives some impression of the level of fees paid.

### A lucrative business for some

The amount of money spent on advisers during merger battles is truly astonishing. In 2000 Klaus Esser, the chairman of Mannesmann, felt compelled to put an upper limit on the cost of advisers assisting the company trying to fend off a bid from Vodafone. What would you regard as a reasonable limit? £10m? or maybe £15m at a push? Surely that would buy a lot of merchant bankers', lawyers', and PR advisers' time? Well, Esser set the limit at €200m (£140m). Mannesmann employed four investment banks, four legal firms and a host of other consultants. The bidder spent even more – it was reckoned that the cost of the bid (including the transaction costs of setting up a joint venture with Bell Atlantic) amounted to £400m. Admittedly some of these costs are related to raising funds, but even so we are looking at handsome take-home pay for advisers.

Royal Bank of Scotland incurred £93m of advisory fees in bidding for NatWest. Bank of Scotland bid for NatWest at the same time. Even though it failed it spent £56m on advisory fees. In 2001 Bank of Scotland eventually found a partner in Halifax. The investment banks charged £40m to assist the marriage – and this was despite the fact that it was an agreed merger. The total cost of the deal was £76m, including financial advice, printing, postage and legal fees. This means that Barclays got a 'bargain' from its advisers: for its 2000 friendly merger with Woolwich the total transaction costs were a mere £30.5m, of which £21m went to advisers.

In 2003, total UK mergers and acquisition fees amounted to about £650m – and this is a year when the M&A market was at a low ebb! 'Typically, M&A fees average between 0.3 per cent and 0.5 per cent of the value of the target.'<sup>10</sup>

**EXHIBIT 11.6** Advisers don't come cheap

There is also the press, ranging from tabloids to specialist publications. Even a cursory examination of them gives the distinct impression that they tend to have a statistical bias of articles which emphasize the positive aspects of mergers. It is difficult to find negative articles, especially at the time of a takeover. They like the excitement of the merger event and rarely follow up with a considered assessment of the outcome. Also the press reports generally portray acquirers as dynamic, forward-looking and entrepreneurial.

It seems reasonable to suppose that professionals engaged in the merger market might try to encourage or cajole firms to contemplate a merger and thus generate turnover in the market. Some provide reports on potential targets to try and tempt prospective clients into becoming acquirers.

Of course, the author would never suggest that such esteemed and dignified organizations would ever stoop to promote mergers for the sake of increasing fee levels alone. You may think that, but I could not possibly comment.

### **Suppliers and customers**

In 1999 British Steel and Hoogovens merged to form Corus. One of the key drivers of the merger was the forecast that the major car producers would combine, meaning fewer buyers who would insist steel makers should supply car plants anywhere in the world. A similar logic applied to the mergers of Bosch with American Allied Signal and Lucas with Varity in the late 1990s. There was pressure from the customers – the car producers. They were intent on reducing the number of car-parts suppliers and to put increased responsibility on the few remaining suppliers. Instead of buying in small mechanical parts from dozens of suppliers and assembling them themselves into, say, a braking system, the assemblers wanted to buy the complete unit. To provide a high level of service Bosch, which is skilled in electronics, needed to team up with Allied Signal for its hydraulics expertise. Similarly Lucas, which specializes in mechanical aspects of braking, needed Varity's electronic know-how. Ford announced that it was intent on reducing its 1,600 suppliers to about 200 and is 'even acting as marriage broker to encourage smaller suppliers to hitch-up with bigger, first-tier suppliers'.<sup>11</sup> These suppliers would then be world players with the requisite financial, technical and managerial muscle.

An example of suppliers promoting mergers is at the other end of the car production chain. Motor dealers in the UK in the late 1990s were sent a clear message from the manufacturers that a higher degree of professionalism and service back-up is required. This prompted a flurry of merger activity as the franchisees sought to meet the new standards.

Figure 11.1 provided a long list of potential merger motives (see p. 259). This list is by no means complete. Examining the reasons for merger is far from straightforward. There is a great deal of complexity, and in any one takeover, perhaps half a dozen or more of the motives discussed are at play.

## Do the shareholders of acquiring firms gain from mergers?

*Some* of the evidence on the effects of acquisitions on the shareholders of the bidding firm is that in slightly over half of the cases shareholders benefit. However, most studies show that acquiring firms give their shareholders poorer returns on average than firms that are not acquirers. Even studies which show a gain to acquiring shareholders tend to produce very small average gains – see Table 11.2.

**TABLE 11.2**

**Summary of some of the evidence on merger performance from the acquiring shareholders' perspective**

Study	Country of evidence	Comment
Meeks (1977)	UK	At least half of the mergers studied showed a considerable decline in profitability compared with industry averages.
Firth (1980)	UK	Relative share price losses are maintained for three years post-merger.
Government Green Paper (1978) (A review of monopolies and mergers policy) (1978)	UK	At least half or more of the mergers studied have proved to be unprofitable.
Ravenscraft and Scherer (1987)	USA	Small but significant decline in profitability on average.
Limmack (1991)	UK	Long-run under-performance by acquirers.
Franks and Harris (1989)	UK and USA	Share returns are poor for acquirers on average for the two years under one measurement technique, but better than the market as a whole when the CAPM is used as a benchmark.
Sudarsanam, Holl and Salami (1996)	UK	Poor return performance relative to the market for high-rated (judged by price to earnings ratio) acquirers taking over low-rated targets. However some firms do well when there is a complementary fit in terms of liquidity, slack and investment opportunities.
Manson, Stark and Thomas (1994)	UK	Cash flow improves after merger, suggesting operating performance is given a boost.
Gregory (1997)	UK	Share return performance is poor relative to the market for up to two years post-merger, particularly for equity-financed bids and single (as opposed to regular) bidders.

TABLE 11.2 (CONTINUED)

Study	Country of evidence	Comment
Loughran and Vijh (1997)	USA	In the five post-merger years firms that offer shares as payment show negative returns relative to the market. Those that offer cash show positive market-adjusted returns.
Rau and Vermaelen (1998)	USA	Acquirers under-perform post-merger. This is due to over-optimism by investors leading to over-pricing of some acquirers regarded as glamour stocks at the time of the merger.
Sudarsanam and Mahate (2003)	UK	Generally acquirers under-perform. Cash acquirers generate higher returns than equity payment acquirers. High price to earnings ratio (and low book to market ratio) acquirers do not perform as well as low PER acquirers and low book to market ratio acquirers.
Powell and Stark (2004)	UK	Takeovers result in modest improvements in operating performance of acquirers.

KPMG sent a report to the Press in November 1999 showing the poor performance of cross-border mergers in terms of shareholder value. They then, embarrassed, tried to retrieve the report before it received publicity. Many commentators said that the evidence, that only 17 percent of cross-border mergers increased shareholder value, would not help KPMG win business assisting firms conducting such mergers.

Much of the recent research has drawn attention to differences in post-acquisition performance of acquirers that are highly rated by investors at the time of the bid ('glamour shares') and the post-acquisition performance of low rated acquirer ('value shares'), e.g. low price earnings ratios or low share price relative to balance sheet net asset value. This over-valuation of glamorous shares seems to be at least a partial explanation for subsequent under-performance. Over time investors reassess the price premium placed on the glamour shares bringing their prices down – whether they are acquirers or not.

## Managing mergers

Many mergers fail to produce shareholder wealth and yet there are companies that pursue a highly successful strategy of expansion through mergers. This section highlights some of the reasons for failure and some of the requirements for success.

## The three stages

There are three phases in merger management. It is surprising how often the first and third are neglected while the second is given great amounts of managerial attention. The three stages are:

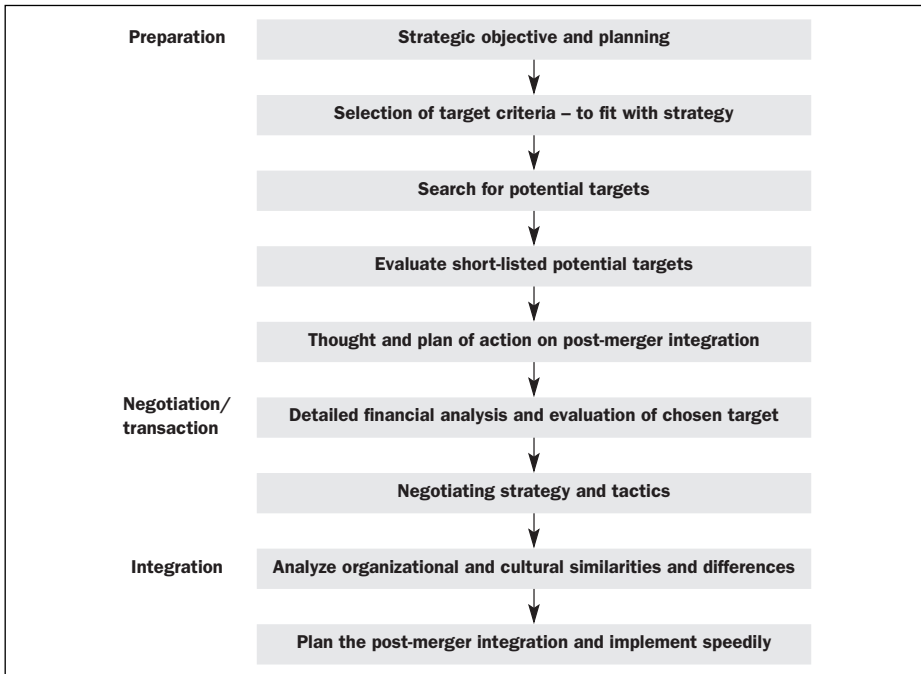
- preparation
- negotiation and transaction
- integration.

In the preparation stage strategic planning predominates. A sub-set of the strategic thrust of the business might be mergers. Targets need to be searched for and selected with a clear purpose – shareholder wealth maximization in the long term. There must be a thorough analysis of the potential value to flow from the combination and tremendous effort devoted to the plan of action which will lead to the successful integration of the target. The negotiation and transaction stage has two crucial aspects to it.

- *Financial analysis and target evaluation* This evaluation needs to go beyond mere quantitative analysis into fields such as human resources and competitive positioning.
- *Negotiating strategy and tactics* It is in the area of negotiating strategy and tactics that the specialist advisers are particularly useful. However the acquiring firm's management must keep a tight rein and remain in charge.

The integration stage is where so many mergers come apart. It is in this stage that the management need to consider the organizational and cultural similarities and differences between the firms. They also need to create a plan of action to obtain the best post-merger integration. The key elements of these stages are shown in Figure 11.2.

Too often the emphasis in managing mergers is firmly on the 'hard' world of identifiable and quantifiable data. Here economics, finance and accounting come to the fore. There is a worrying tendency to see the merger process as a series of logical and mechanical steps, each with an obvious rationale and a clear and describable set of costs and benefits. This approach all but ignores the potential for problems caused by non-quantifiable elements, for instance, human reactions and interrelationships. Matters such as potential conflict, discord, alienation and disloyalty are given little attention.<sup>12</sup> There is also a failure to make clear that the nature of decision-making in this area relies as much on informed guesses, best estimates and hunches as on cold facts and figures.

**FIGURE 11.2****The progression of a merger****The organizational process approach**

The organizational process approach takes into account the ‘soft’ aspects of merger implementation and integration. Here the acquisition process, from initial strategic formulations to final complete integration, is perceived as a complex, multi-faceted program with the potential for a range of problems arising from the interplay of many different hard and soft factors. Each merger stage requires imaginative and skilled management for the corporate objective to be maximized (Sudarsanam (2003) is an excellent guide).

**Problem areas in merger management**

We now examine some of the areas where complications may arise.

**The strategy, search and screening stage**

The main complicating element at the stage of strategy, search and screening is generated by the multitude of perspectives regarding a particular target candidate. Each discipline within a management team may have a narrow competence and focus, so there is potential for a fragmented approach to the evaluation of targets. For example, the marketing team may focus exclusively on the potential for marketing economies and other benefits, the research and development team on



the technological aspects and so on. Communication between disparate teams of managers can become complicated and the tendency will be to concentrate the communication effort on those elements which can be translated into the main communicating channel of business: quantifiable features with 'bottom lines' attached. This kind of one-dimensional communication can, however, all too easily fail to convey the full nature of both the opportunities and the problems. The more subtle aspects of the merger are likely to be given inadequate attention.

Another problem arises when senior managers conduct merger analysis in isolation from managers at the operating level. Not only may these 'coal-face' managers be the best informed about the target, its industry and the potential for post-merger integration problems; their commitment is often vital to the integration program.

There is an obvious need to maximize the information flow effort, both to obtain a balanced, more complete view of the target, and to inform, involve and empower key players in the successful implementation of a merger strategy. An example of an incomplete view of the target prior to merger which led to an underestimation of the potential for cannibalization of sales of the acquirer and the tying up of managerial time is the case of the combination of JD Sports and First Sports – see Exhibit 11.7.

## Warning hurts John David shares

Maija Pesola

Shares in John David Group lost a sixth of their value yesterday as the sporting goods retailer, which owns the JD Sports brand, warned that this year's profits were likely to fall 'significantly below' expectations.

The warning – the third in eight months – came as the company admitted it had underestimated the problems involved in integrating the First Sport chain of stores it bought last year. ...

The group bought the 209 First Sport stores from Blacks Leisure in May 2002 to take them upmarket. But it has struggled with the revamp, as attempts to rebrand First Sport into a football-focused retailer have foundered.

Roger Best, chairman, yesterday admitted the lengthy integration process had led to too many of the senior management being 'distracted' from their

primary duties, leading to poor purchasing and merchandising decisions.

He said First Sport stores had cannibalised sales at existing JD Sports shops more than expected. 'There are a large number of cross-over sites. It is something that we underestimated, and it is only in the last few months that we have realised the true extent of the problem,' Mr Best said.

The company is to close a larger number of First Sports stores than anticipated. Some 15 have already gone, with a further 38 planned to go by March 2005. ...

Analysts, who have branded the First Sports acquisition as 'disastrous' for the group, yesterday downgraded their forecasts for this year's profits to between £8.5 and £9m, compared with previous consensus estimates of £18m. ...

### EXHIBIT 11.7 Warning hurts

Source: *Financial Times* 7 August 2003

### **The bidding stage**

Once a merger bid is under way a strange psychology often takes over. Managers seem to feel compelled to complete a deal. To walk away would seem like an anticlimax, with vast amounts of money spent on advisers and nothing to show for it. Also they may feel that the investment community will perceive this management as being one unable to implement its avowed strategic plans. It may be seen as 'unexciting' and 'going nowhere' if it has to retreat to concentrate on its original business after all the excitement and promises surrounding a takeover bid.

Managers also often enjoy the thrill of the chase and develop a determination to 'win'. Pay, status and career prospects may hinge on rapid growth. Additionally, acquirers may be impelled to close the deal quickly by the fear of a counter-bid by a competitor, which, if successful, would have an adverse impact on the competitive position of the firm.

Thus mergers can take on a momentum that is difficult to stop. This is often nurtured by financial advisers keen on completing a transaction.

These phenomena may help to explain the heavy emphasis given to the merger transaction to the detriment of the preparation and integration stages. They may also go some way to explaining merger failure – in particular, failure to enhance shareholder value as a result of the winner's curse.

### **Expectations of the acquiring firm's operational managers regarding the post-merger integration stage**

Clarity and planning are needed to avoid conflict and disappointment among managers. For example, the integration strategy may outline a number of different tasks to be undertaken in the 12–24 months following an acquisition. These may range from disposal of assets and combining operating facilities to new product development and financial reconstruction. Each of these actions may be led by a different manager. Their expectations regarding the speed of implementation and the order in which each of these actions will be taken may be different. A clear and rational resource-planning and allocation mechanism will reduce ambiguity and improve the co-ordination of decision-making.

### **Aiming for the wrong type of integration**

There are different degrees of integration when two firms come together under one leadership. At one extreme is the complete *absorption* (or *integration*) of the target firm and the concomitant fusing of two cultures, two operational procedures and two corporate organizations. At the other, is the *holding company, preservation* or *portfolio approach* where the degree of change of the acquired subsidiary may amount merely to a change in some financial control procedures, but otherwise the target firm's management may continue with their own systems, unintegrated operations and culture.

The complete absorption approach is usually appropriate in situations where production and other operational costs can be reduced through economies of scale and other synergies, or revenues can be enhanced through, say, combined

marketing and distribution. The preservation approach is most suitable when it is recognized that the disbenefits of forcing organizations together outweigh the advantages, for example when the products and markets are completely different and the cultures are such that a fusion would cause an explosive clash. These arm's-length mergers are typical of the acquisitive conglomerates. In such mergers general management skills are transferred along with strict financial performance yardsticks and demanding incentive schemes, but little else has changed.

With *symbiosis-based* mergers there is a need to keep a large degree of difference, at least initially, in culture, organization and operating style, but at the same time to permit communication and cross-fertilization of ideas. There may also be a need to transfer skills from one part of the combined organization to another, whether through training and teaching or by personnel reassignment. An example might be where a book publisher acquires an internet service provider; each is engaged in a separate market but there is potential for profitable co-operation in some areas. As well as being aware of the need for mutual assistance, each organization may be jealous of its own way of doing things and does not want its *esprit de corps* disrupted by excessive integration.

Exhibit 11.8 expresses the failure of some acquirers to allow adequately for the complicating human factor.

### **Why do mergers fail to generate value for acquiring shareholders?**

A definitive answer as why mergers fail to generate value for acquiring shareholders cannot be provided, because mergers fail for a host of reasons. However there do appear to be some recurring themes.

#### **The strategy is misguided**

History is littered with strategic plans that turned out to be value destroying rather than value creating. Daimler-Benz in combining Mercedes with Fokker and Dasa tried to gain synergies from an integrated transport company then it tried to become a global car producer by merging with Chrysler. Marconi sold off its defense businesses to concentrate on telecommunication equipment. It spent a fortune buying companies at the forefront of technology only to slam into the hi-tech recession in 2001 – its shares lost 98 percent of their value. At the turn of the millennium, Time Warner thought it needed to pay a very high price to merge with AOL so that it could take a leading part in the convergence of media and information/communication technology. Building societies, banks and insurance companies in the UK bought hundreds of estate agents in the 1980s in the belief that providing 'one-stop shopping' for the house-owner would be attractive. Many of these agency chains were sold off in the 1990s at knock-down prices. Fashion also seems to play its part, as with the conglomerate mergers of the 1960s, the cross-border European mergers of the early 1990s prompted by the development of the single market and the dot.com merger frenzy around the turn of the millennium.

## Marrying in haste

**Mergers and acquisitions continue apace in spite of an alarming failure rate and evidence that they often fail to benefit shareholders, writes**

Michael Skapinker

A long list of studies have all reached the same conclusion: the majority of takeovers damage the interests of the shareholders of the acquiring company. They do, however, often reward the shareholders of the acquired company, who receive more for their shares than they were worth before the takeover was announced ...

Why do so many mergers and acquisitions fail to benefit shareholders? Colin Price, a partner at McKinsey, the management consultants, who specialises in mergers and acquisitions, says the majority of failed mergers suffer from poor implementation. And in about half of those, senior management failed to take account of the different cultures of the companies involved.

Melding corporate cultures takes time, which senior management does not have after a merger, Mr Price says. 'Most mergers are based on the idea of "let's increase revenues", but you have to have a functioning management team to manage that process. The nature of the problem is not so much that there's open warfare between the two sides. It's that the cultures don't meld quickly enough to take advantage of the opportunities. In the meantime, the marketplace has moved on.'

Many consultants refer to how little time companies spend before a merger thinking about whether their organisations are compatible. The benefits of mergers are usually couched in financial or commercial terms: cost-savings can be made or the two sides have complementary businesses that will allow them to increase revenues ...

Mergers are about compatibility, which means agreeing whose values will prevail and who will be the dominant partner. So it is no accident that managers as well as

journalists reach for marriage metaphors in describing them. Merging companies are said to 'tie the knot'. When mergers are called off, as with Deutsche Bank and Dresdner Bank, the two companies fail to 'make it up the aisle' or their relationship remains 'unconsummated'.

Yet the metaphor fails to convey the scale of risk companies run when they launch acquisitions or mergers. Even in countries with high divorce rates, marriages have a better success rate than mergers. And in an age of frequent pre-marital cohabitation, the bridal couple usually know one another better than the merging companies do.

A more appropriate comparison might be with second marriages, particularly where children are involved. This was the description used by John Reed, former chairman of Citicorp, which merged with Travelers Group in 1998 to create Citigroup. Mr Reed and Sandy Weill, head of Travelers, agreed to be joint chairmen of the merged company, a relationship that ended this year when Mr Reed retired.

Speaking to the US Academy of Management last year, before his departure, Mr Reed said: 'The literature on putting together two families speaks volumes to me. The problems of step-parents, the descriptions of some children rejecting other parents, and all of the children being generally ticked off, is all meaningful ... Sandy and I both have the problem that our "children" look up to us as they never did before, and reject the other parent with equal vigour.'

But Prof Sirower, who has written a book on acquisitions called *The Synergy Trap*, rejects the view that the principal problem is post-merger implementation. 'Many large acquisitions are dead on arrival, no matter how well they

are managed after the deal is done,' he says. Prof Sirower asks why managers should pay a premium to make an acquisition when their shareholders could invest in the target company themselves. How sure are managers that they can extract cost savings or revenue improvements from their acquisition that match the size of the takeover premium?

Prof Sirower denies he is saying companies should never make acquisitions. If 65 per cent of mergers fail to benefit shareholders, 35 per cent are successful.

How can acquirers try to ensure they are among the successful minority? Ken Favaro, managing partner of Marakon, a consultancy that has worked for Coca-Cola, Lloyds TSB and Boeing, suggests two conditions for success. The first is to define what success means. 'The combined entities have to deliver better returns to the shareholders than they

would separately. It's amazing how often that's not the pre-agreed measure of success,' Mr Favaro says.

Second merging companies need to decide in advance which partner's way of doing things will prevail. 'Mergers of equals can be so dangerous because it is not clear who is in charge,' says Mr Favaro.

Prof Sirower adds that managers need to ask what advantages they will bring to the acquired company that competitors will find difficult to replicate ...

Given how heavily the odds are stacked against successful mergers, managers should consider whether their time and the shareholders' money would not be better employed elsewhere – improving customer service, for example. Above all, they need to ask whether they are launching a takeover because their acquisition will improve their performance or because they cannot think what else to do.

### EXHIBIT 11.8 Marrying in haste

Source: *Financial Times* 12 April 2000

#### Over-optimism

Acquiring managers have to cope with uncertainty about the future potential of their acquisition. It is possible for them to be over-optimistic about the market economics, the competitive position and the operating synergies available. They may underestimate the costs associated with the resistance to change they may encounter, or the reaction of competitors. Merger fever, the excitement of the battle, may lead to openness to persuasion that the target is worth more than it really is. A common mistake is to underestimate the investment required to make a merger work, particularly in terms of managerial time.

#### Failure of integration management

One problem is the over-rigid adherence to prepared integration plans. Usually plans require dynamic modification in the light of experience and altered circumstances. The integration program may have been based on incomplete information and may need post-merger adaptation to the new perception of reality.

Common management goals and the engendering of commitment to those goals is essential. The morale of the workforce can be badly damaged at the time of a merger. The natural uncertainty and anxiety has to be handled with under-

## On masquerading skimmed milk, lame horses and sexy deals

We believe most deals do damage to the shareholders of the acquiring company. Too often, the words from *HMS Pinafore* apply: 'Things are seldom what they seem, skim milk masquerades as cream.' Specifically, sellers and their representatives invariably present financial projections having more entertainment value than educational value. In the production of rosy scenarios, Wall Street can hold its own against Washington.

In any case, why potential buyers even look at projections prepared by sellers baffles me. Charlie and I never give them a glance, but instead keep in mind the story of the man with an ailing horse. Visiting the vet, he said: 'Can you help me? Sometimes my horse walks just fine and sometimes he limps.' The Vet's reply was pointed: 'No problem – when he's walking fine, sell him.' ...

Talking to *Time Magazine* a few years back, Peter Drucker got to the heart of things: 'I will tell you a secret: Dealmaking beats working. Dealmaking

is exciting and fun, and working is grubby. Running anything is primarily an enormous amount of grubby detail work ... dealmaking is romantic, sexy. That's why you have deals that make no sense.'

... I can't resist repeating a tale told me last year by a corporate executive. The business he grew up in was a fine one, with a long-time record of leadership in its industry. Its main product, however, was distressing glamorless. So several decades ago, the company hired a management consultant who – naturally – advised diversification, the then-current fad. ('Focus' was not yet in style.) Before long, the company acquired a number of businesses, each after the consulting firm had gone through a long – and expensive – acquisition study. And the outcome? Said the executive sadly 'When we started we were getting 100% of our earnings from the original business. After ten years, we were getting 150%.'

### EXHIBIT 11.9 Skimmed milk masquerades as cream

Source: Letter to shareholders, *Berkshire Hathaway Annual Report 1995*. © Warren Buffett

standing, tact, integrity and sympathy. Communication and clarity of purpose are essential as well as rapid implementation of change. Cultural differences need to be tackled with sensitivity and trust established. Lord Browne, of BP, advises quick integration: 'It's very important to mix the cultures early on. If the entities that existed previously still exist, then there is great reluctance to change anything.' He also suggests using a third party to help select the best managers. Following the merger with Amoco, BP sent 400 top executives to an independent recruitment agency for assessment. 'When you merge with a company, you basically play with half a deck [of cards] because you know all your people, and they know all theirs. So how do you find a way of actually knowing everything about everyone – the answer is get a third party in.'<sup>13</sup>

The absence of senior management commitment to the task of successful integration severely dents the confidence of target and acquired managers.

Coopers & Lybrand, the international business advisers, in 1992 conducted 'in-depth interviews with senior executives of the UK's top 100 companies covering 50 deals'. Some factors emerged which seem to contribute to failure, and others which are critical for raising the chances of success. These are shown in Figure 11.8.

**FIGURE 11.3****Survey on the reasons for merger failure and success – Coopers & Lybrand**

The most commonly cited causes of failure include:		The most commonly cited reasons for success include:	
Target management attitudes and cultural differences	85%	Detailed post-acquisition plans and speed of implementation	76%
Little or no post-acquisition planning	80%	A clear purpose for making acquisitions	76%
Lack of knowledge of industry or target	45%	Good cultural fit	59%
Poor management and poor management practices in the acquired company	45%	High degree of management co-operation	47%
Little or no experience of acquisitions	30%	In-depth knowledge of the acquiree and his industry	41%

The ten rules listed in Figure 11.4 are NOT recommended for shareholder wealth-oriented managers.

**FIGURE 11.4****Arnold's ten golden rules for alienating 'acquired' employees**

1. Sack people in an apparently arbitrary fashion.
2. Insist (as crudely as possible) that your culture is superior. Attack long-held beliefs, attitudes, systems, norms, etc.
3. Don't bother to find out the strengths and weaknesses of the new employees.
4. Lie to people – some old favourites are:
  - 'there will not be any redundancies';
  - 'this is a true merger of equals'.
5. Fail to communicate your integration strategy:
  - don't say why the pain and sacrifice is necessary, just impose it;
  - don't provide a sense of purpose.
6. Encourage the best employees to leave by generating as much uncertainty as possible.
7. Create stress, loss of morale and commitment, and a general sense of hopelessness by being indifferent and insensitive to employees' need for information.
8. Make sure you let everyone know that you are superior – after all, you won the merger battle.
9. Sack all the senior executives immediately – their knowledge and experience and the loyalty of their subordinates are cheap.
10. Insist that your senior management appear uninterested in the boring job of nuts-and-bolts integration management. After all, knighthoods and peerages depend upon the next high-public-profile acquisition.



Exhibit 11.10 highlights some aspects not yet covered, including:

- a management and personnel audit;
- an alternative to merger is a strategic alliance;
- acquirers that fail to deliver value often become targets themselves.

## A sometimes fatal attraction

Vanessa Houlder

The problems with takeovers go beyond faulty strategic logic or paying too high a price. Even good deals founder if they are poorly managed after the merger ...

The task of successfully implementing an acquisition or merger is formidable. If the acquiring company's shareholders are to make money from the deal, sales must be increased and costs reduced to a level that compensates for the premium over the share price paid for the company. This is rarely less than 20 per cent.

Unless there is a large overlap between the companies there are few easy savings. The targets of hostile bids are not necessarily poor performers, according to a study of takeovers in the mid-1980s by the London Business School ...

[Most] companies delude themselves about the scale and nature of the task. They focus on revenue-enhancement opportunities rather than cost reduction, according to David Wightman, global head of strategy practice at PA Consulting Group. 'In fact revenue synergies are not often achieved in any great quantity, and frequently not at all.'

Companies also often delude themselves about the speed at which they should act. The desire to respect the culture of the acquired company and prevent the defection of important staff often slows the pace of integration ...

The disadvantage with a slow approach to integration is that it tends to dissipate momentum and enthusiasm. Moreover, delays can dilute the financial benefits of a deal ...

Nonetheless, the practical difficulty of integrating companies with different cultures cannot be underestimated.

Recent research by London's Imperial College into European cross-border deals found that differences in management style – the formality of procedures, the adherence to job descriptions, the structure of communications – bore a strong correlation to deals' chances of failure ...

[Consultants] urge managers to adopt different styles of management for different types of deal. Bill Pursche of McKinsey argues that different styles are appropriate depending on the degree of business overlap, the relative size of companies, the companies' skills, the urgency and source of the expected returns and the style of leadership.

For example, if cost savings are the main rationale of the merger, targets should be set at the top and passed through the organisation. If the goal is to achieve revenue synergies or longer-term skill transfers, then a more participatory approach, drawing recommendations from the 'grass roots', is appropriate. Pursche calls this 'empowering the troops' and says it can result in strong morale. But it is more common in merging companies to find poor morale, rising staff turnover and falling productivity.

There is probably no easy solution to poor morale. Reassuring staff about job security may not be possible – and may be counterproductive if proved false. Even so, companies are invariably advised to try to reduce uncertainty and explain the merger's rationale, through newsletters and meetings between senior executives and employees.

Unsurprisingly, pay is one of the most marked influences on morale. A London Business School study in 1987



found that in two-thirds of successful takeovers, the acquired management reported either improved performance incentives, better pension entitlements, better career prospects, or the introduction of share options.

The same study highlighted another important influence on the ultimate success of the acquisition: a thorough audit of the target company before the takeover.

Whereas all the buyers in the LBS study conducted financial audits of the acquired companies before they bought them, only 37 per cent carried out a management or personnel audit. Moreover, although buyers stressed the importance of the purchased company's middle management, 70 per cent did not meet these managers before the takeover.

The paucity of pre-merger planning causes frustration, particularly among managers concerned with human resources. A seminar of directors and financiers involved in takeovers sponsored by People in Business, a consultancy, uncovered a strongly held view that deals were too focused on financial measures ...

However, institutional investors are imposing a tougher discipline on bidders than 10–15 years ago, according to Julian Franks of London Business School. 'People who acquire badly, frequently become targets themselves,' he says.

Another feature of the 1990s is the growth in strategic alliances as a cheaper, less risky route to a strategic goal than takeovers.

### EXHIBIT 11.10

Source: *Financial Times*, 11 September 1995

## Conclusion

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At a minimum this chapter should have made it clear that following a successful merger strategy is much more than simply 'doing the deal'. Preparation and integration are usually of greater significance to the creation of value than the negotiation and transaction stage. And yet, too often, it is towards this middle stage that most attention is directed.

Doubts have been raised about the purity of the motives for mergers but we should restrain ourselves from being too cynical as many mergers do create wealth for shareholders and society. Industries with a shifting technological or market base may need fewer larger firms to supply goods at a lower cost. The savings from superior managerial talent are genuine and to be praised in many cases. Restructuring, the sharing of facilities, talent and ideas, and the savings from the internalization of transactions are all positive outcomes and often outweigh the negative effects.

Like many tools in the armory of management, growth through mergers can be used to create or destroy.

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<a href="http://www.ft.com">www.ft.com</a>	Financial Times
<a href="http://www.londonstockexchange.com">www.londonstockexchange.com</a>	London Stock Exchange
<a href="http://www.thetakeoverpanel.org.uk">www.thetakeoverpanel.org.uk</a>	The Takeover Panel

## Notes

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## THE MERGER PROCESS

**Introduction**

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**The City Code on Takeovers and Mergers**

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**Actions before the bid**

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**The bid**

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**After the bid**

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**Defense tactics**

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**Paying for the target's shares**

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**Conclusion**

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## Introduction

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This chapter focusses on two aspects of mergers. It first covers the middle stage of the merger process: that is, the deal-making stage, particularly in the circumstances of a hostile takeover. We look at the restraining rules and regulatory bodies that attempt to prevent unfairness.

Second, the chapter examines the question of what type of payment to make for the shares of the target firm. Should the acquirer offer cash, shares in itself or some other form of payment?

## The City Code on Takeovers and Mergers

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The City Code on Takeovers and Mergers provides the main governing rules for companies engaged in merger activity. The actions and responsibilities of quoted and unlisted public companies have been laid down over a period of more than 30 years. The Code has been developed in a self-regulatory fashion by City institutions, notably the London Stock Exchange, the Bank of England, the investment institutions, companies, banks, self-regulatory organizations (SROs) and the accounting profession. It is administered on a day-to-day basis by the Panel Executive of the City Panel on Takeovers and Mergers. The UK government formally recognizes the Takeover Panel's authority in the Financial Services and Markets Act 2000.

Statutory law is relatively unimportant in the regulation of mergers; its main contribution is to require that directors carry out their duty without prejudice in a fiduciary manner. That is, that they show trustworthy and faithful behavior for the benefit of shareholders equally.

The self-regulatory non-statutory approach is considered superior because it can provide a quick response in merger situations and be capable of regular adaptation to changed circumstances. There are frequent occurrences where companies try to bend or circumvent the rules and it is useful to have a system of regulation that is capable of continual review and is updated as new loopholes are discovered and exploited. Exhibit 12.1 gives some indication of the way in which the Takeover Panel responds to the changing types of unfairness by changing the rules. Statutory law would not have the same degree of flexibility. (Note that 'creeping' means achieving control of a company by buying up to 1 percent per year even though over 30 percent of the shares are already held and a formal bid has not been made.)

## Flexibility is takeover body's key to escaping EU hangman

A review of the 'creeper' rule may stave off a threat from Brussels, says Jane Martinson

Plans by the Takeover Panel, the UK's acquisitions watchdog, to review the 'creeping' provision of its rulebook come at the same time as the threat of encroachment from the European Commission.

Flexibility and speedy answers to members' concerns are key weapons in the panel's fight against further legislation and government intervention.

Action on the creeper provision – which allows shareholders slowly to gain control of a company without launching a bid would follow a relative flurry of activity from a body keen to demonstrate the adaptability of its system of voluntary agreement.

Few in the City support more legislation or much change to the 'regulation by club rules' that underpins the Takeover Panel, a self-regulatory organisation staffed largely by secondees from City firms.

But the panel's recent decision to modernise its rules follows criticism that it was not doing enough to ensure fair play.

'If the panel does not show itself to be flexible it's putting its head in the

noose of European regulation,' said one institutional investor ...

The decision of Alistair Defriez, the body's director-general, to raise the creeper provision at the next panel meeting comes less than a month after the High Court rejected an unprecedented legal action based on it. Minority shareholders in Astec, the electronic power supply group, went to the High Court after Emerson, the US group, increased steadily its stake in Astec to 51 per cent by using the creeper provision ....

This decision, to be put to the 18-strong panel in July, has pleased several institutional investors ...

Mr Defriez is adamant that extra legislation should be avoided. 'The great thing about the code is that it isn't legislation carved in stone which nobody can change for 20 years. If we believe it [the panel] isn't working to the highest standards we change it,' he said. He added that a simple statement is enough to signal a change in the code.

Action using legislation, in contrast, 'could keep a court case going for years'.

### EXHIBIT 12.1 Flexibility is the key

Source: *Financial Times*, 29 May 1998

The Code may not have the force of law but the Panel does have some powerful sanctions. These range from public reprimands to the shunning of Code defiers by the regulated City institutions – the Financial Services Authority, FSA, requires that no regulated firm (such as a bank, a broker or an adviser) should act for client firms that seriously break the Panel's rules. Practitioners in breach of the Code may be judged not fit and proper persons to carry on investment business by the FSA so there is considerable leverage over the City institutions who might otherwise be tempted to assist a rule breaker. The FSA may also take legal action under market abuse legislation – e.g. when there is share price manipulation. In rare cases the Panel may temporarily remove share-voting rights for particular shareholders.

The fundamental objective of the Takeover Panel regulation is to ensure fair and equal treatment for all shareholders. The main areas of concern are:

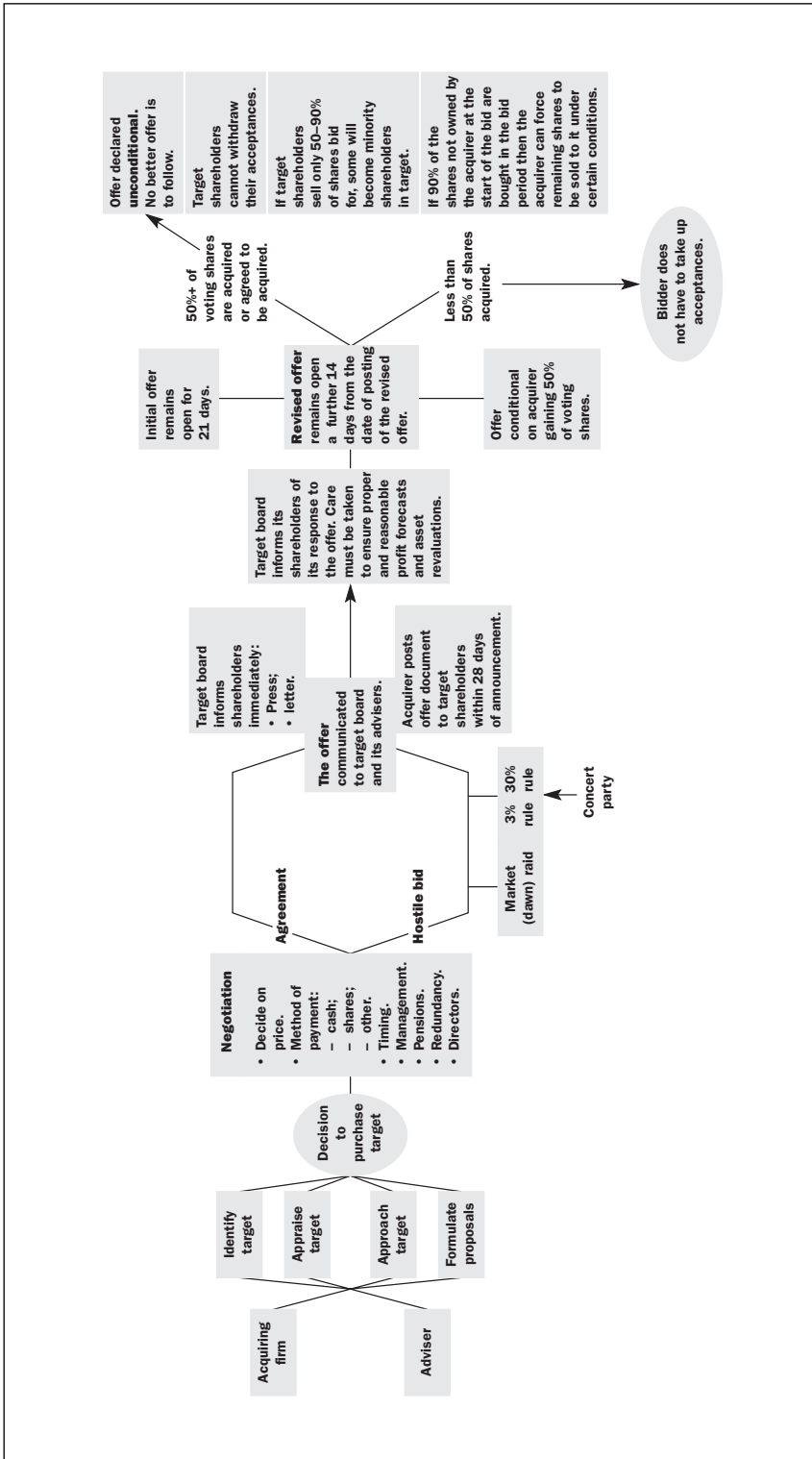
- shareholders being treated differently, for example large shareholders getting a special deal;
- insider dealing (control over this is assisted by statutory rules);
- target management action that is contrary to its shareholders' best interests; for example, the advice to accept or reject a bid must be in the shareholders' best interest, not that of the management;
- lack of adequate and timely information released to shareholders;
- artificial manipulation of share prices; for example an acquirer offering shares cannot make the offer more attractive by getting friends to push up its share price;
- the bid process dragging on and thus distracting management from their proper tasks.

The Office of Fair Trading (OFT) also takes a keen interest in mergers to ensure that they do not produce 'a substantial lessening of competition'. The OFT has the power to clear a merger. A small minority of proposed mergers may, after an OFT initial screening, be followed by a Competition Commission (CC) investigation. The CC is the ultimate arbiter in deciding if a substantial lessening of competition is likely. It conducts full detailed investigations and can insist on major changes to the merged entity. For example William Morrison was required to sell a number of Safeway supermarkets following their merger in 2004.<sup>1</sup> A CC inquiry may take several months to complete, during which time the merger bid is put on hold. Currently (2004) there is some confusion as to where the jurisdiction boundaries of the OFT and the CC lie because competitors of the merging firms can ask a tribunal (Competition Appeal Tribunal) to overturn a clearance by the OFT and insist on a CC referral, casting doubt on the power of the OFT. Another hurdle in the path of large intra-European Union mergers is their scrutiny by the European Commission in Brussels. This is becoming increasingly influential.

## Action before the bid

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Figure 12.1 shows the main stages of a merger. The acquiring firm usually employs advisers to help make a takeover bid. Most firms carry out mergers infrequently and so have little expertise in-house. The identification of suitable targets may be one of the first tasks of the advisers. Once these are identified there would be a period of appraising the target. The strategic fit would be considered and there would be a detailed analysis of what would be purchased. The product markets and types of customers could be investigated and there would be a financial analysis showing sales, profit and rates of return history. The assets and liabilities would be assessed and non-balance sheet assets such as employees' abilities would be considered.



**FIGURE 12.1**  
The merger process



If the appraisal stage is satisfactory the firm may approach the target. Because it is often cheaper to acquire a firm with the agreement of the target management, and because the managers and employees have to work together after the merger, in the majority of cases discussions take place designed to produce a set of proposals acceptable to both groups of shareholders and managers.

During the negotiation phase the price and form of payment need to be decided upon. In most cases the acquirer has to offer a bid premium. This tends to be in the range of 20 to 100 percent of the pre-bid price. The average is about 30–50 percent. The timing of payment is also considered. For example, some mergers involve ‘earn-outs’ in which the selling shareholders (usually the same individuals as the directors) receive payment over a period of time dependent on the level of post-merger profits. The issue of how the newly merged entity will be managed will also be discussed – who will be chief executive? Which managers will take particular positions? Also the pension rights of the target firm’s employees and ex-employees have to be considered, as does the issue of redundancy, especially the removal of directors – what pay-offs are to be made available?

If agreement is reached then the acquirer formally communicates the offer to the target’s board and shareholders. This will be followed by a recommendation from the target’s board to its shareholders to accept the offer.

If, however, agreement cannot be reached and the acquirer still wishes to proceed a hostile bid is created. One of the first stages might be a ‘dawn raid’. This is where the acquirer acts with such speed in buying the shares of the target company that the raider achieves the objective of obtaining a substantial stake in the target before the target’s management have time to react. The acquirer usually offers investors a price which is significantly higher than the closing price on the previous day. This high price is only offered to those close to the market and able to act quickly and is contrary to the spirit of the Takeover Panel’s rules, because not all shareholders can participate. It breaks the rules in another way: the sellers in a ‘dawn raid’ are not aware of all relevant information, in this case that a substantial stake is being accumulated. The Takeover Panel insists that the purchase of 10 percent or more of the target shares in a period of seven days is not permitted if this would take the holding to more than 15 percent (except if the shares are purchased from a single seller).<sup>2</sup> Once a company becomes a bid target any dealings in the target’s shares by the bidder (or an associate) must be publicly disclosed no later than 12 noon on the business day following the transaction. Furthermore, once an offer is underway, any holder of 1 percent or more must disclose dealings by midday of the next business day.

An important trigger point for disclosure of shareholdings in a company, whether the subject of a merger or not, is the 3 percent holding level. If a 3 percent stake is owned then this has to be declared to the company. This disclosure rule is designed to allow the target company to know who is buying its shares and to give it advance warning of a possible takeover raid. The management can then prepare a defense and present information to shareholders should the need arise.

If a company builds up a stake of more than 30 percent of the shares carrying voting rights the Takeover Panel rules usually oblige it to make a cash bid for all of the target company's shares (or a share offer with a cash alternative) at the highest price paid in the previous 12 months. A 30 percent stake often gives the owner a substantial amount of power. It is very difficult for anyone else to bid successfully for the firm when someone already has 30 percent. It is surprising how often one reads in the financial press that a company or individual has bought a 29.9 percent holding so that they have as large a stake as possible without triggering a mandatory bid.

Sometimes, in the past, if a company wanted to take over another it would, to avoid declaring at the 3 percent level (or 5 percent as it was then), or to avoid bidding at the 30 percent level, sneak up on the target firm's management and shareholders. It would form a 'concert party' by persuading its friends, other firms and individuals to buy stakes in the target. Each of these holdings would be below the threshold levels. When the acquirer was ready to pounce it would already have under its control a significant, if not a majority, controlling interest. Today all concert party holdings are lumped together for the purposes of disclosure and trigger points.

A tactic that has become common recently is for a potential bidder to announce that they are thinking of making a bid rather than actually doing it – they make an '*indicative offer*' (dubbed a virtual bid) saying they might bid but not committing themselves to the expense and strict timetable of a formal offer. Shareholders in targets may gain from having potential bidders announce an interest in buying their shares and are in favor of allowing time for the bid to be put together. On the other hand, it is not in the shareholders' interest for the management to continually feel under siege. The Takeover Panel permits indicative offers, but after a few weeks (generally six to eight) without a genuine offer emerging it declares that the potential bidder has to 'put up or shut up' before a deadline date.

### **Traps for bidders to avoid**

If the bidder purchases shares carrying 10 percent or more of the voting rights in the offer period or in the previous 12 months of a bid, the offer must include a cash alternative at the highest price paid by the bidder. A potential bidder should be careful not to buy any shares at a price higher than a fair value.

If the bidder buys shares in the target at a price above the offer price during a bid the offer must be increased to that level. So, be careful of topping up acceptances by offering a high price to a few shareholders.

## The bid

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In both a friendly and a hostile bid the acquirer is required to give notice to the target's board and its advisers that a bid is to be made. The press and the Stock Exchange are usually also informed. The target management must immediately inform their shareholders (and the Takeover Panel). This is done through an announcement to the Stock Exchange and a press notice, which must be quickly followed by a letter explaining the situation. In a hostile bid the target management tend to use phrases like 'derisory offer' or 'wholly unacceptable'.

Within 28 days of the initial notice of an intention to make an offer the offer document has to be posted to each of the target's shareholders. Details of the offer, the acquirer and its plans will be explained. If the acquisition would increase the total value of the acquirer's assets by more than 15 percent the acquirer's shareholders need to be informed about the bid. If the asset increase is more than 25 percent then shareholders must vote in favor of the bid proceeding. They are also entitled to vote on any increase in authorized share capital.

The target management have 14 days in which to respond to the offer document. Assuming that they recommend rejection, they will attack the rationale of the merger and the price being offered. They may also highlight the virtues of the present management and reinforce this with revised profit forecasts and asset revaluations. There follows a period of attack and counter-attack through press releases and other means of communication. Public relations consultants may be brought in to provide advice and to plan tactics.

The offer remains open for target shareholders to accept for 21 days from the date of posting the offer document. If the offer is revised it must be kept open for a further 14 days from the posting date of the revision.<sup>3</sup> However, to prevent bids from dragging on endlessly the Panel insists that the maximum period for a bid is 60 days from the offer document date (posting day). The final offer date is day 46, which allows 14 days for acceptances. There are exceptions: if another bidder emerges, then it has 60 days, and its 60th day becomes the final date for both bidders; or if the Board of the target agrees to an extension; if the bid is referred to the CC the Panel can 'stop the clock'. If the acquirer fails to gain control within 60 days then it is forbidden to make another offer for a year to prevent continual harassment.

Exhibit 12.2, which reproduces an article on Westminster Health Care, shows that despite a 21-day rule, target shareholders have become accustomed to a 60-day period in which to make up their minds.

## Westminster Health Care: quick bid fails

Sameena Ahmad

Institutions joined forces this week to stamp out sudden-death takeover bids by firmly rejecting Westminster Health Care's hostile offer for Goldsborough, a smaller nursing home group.

Confident of City support in the light of the target's share price weakness, Westminster quickly declared its £70m offer final, shortening the timetable for acceptance from the usual 60 days to 21 days. Three-week 'bullet' bids are permissible, but have proved unpopular with investors used to a 60-day timetable, in which the bidder normally raises its offer ...

One leading Goldsborough investor called Westminster's offer 'unduly aggressive', forcing institutions to make snap decisions and preventing the target from mounting a proper defence.

He added: 'Most fund managers are simple folk: stroke us and we roll over, but twist our arms and we bite back.'

Another Goldsborough shareholder, with some 6 per cent of its shares, said the 21-day issue was 'very relevant' to his rejection of the offer. 'This is a small company where there is little guidance from analysts. We need time to properly assess tricky points like asset values.'

Full-term takeovers offer more than just time to reflect. They give rival bidders the time to make a higher offer and advisers and underwriters more chances to earn fees ...

'The 60-day bid process is a ritual,' sighed Westminster chief executive Pat Carter. 'We probably should have followed it.'

### EXHIBIT 12.2 Westminster Health Care: a quick bid fails

Source: *Investors Chronicle*, 19 July 1996

## After the bid

Usually an offer becomes unconditional when the acquirer has bought, or has agreed to buy, 50 percent of the target's shares. Prior to the declaration of the offer as unconditional the bidding firm would have said in the offer documents that the offer is conditional on the acquirer gaining (usually) 50 percent of the voting shares. This allows the bidding firm to receive acceptances from the target shareholders without the obligation to buy.<sup>4</sup> Once it is declared unconditional the acquirer is making a firm offer for the shares that it does not already have, and indicating that no better offer is to follow. Before the announcement of unconditionality those target shareholders who accepted the offer are entitled to withdraw their acceptance – after it, they are forbidden to do so.

Usually in the days following unconditionality the target shareholders who have not already accepted quickly do so. The alternative is to remain a minority shareholder – still receiving dividends but with power concentrated in the hands of a majority shareholder. There is a rule to avoid the frustration of having a small group of shareholders stubbornly refusing to sell. If the acquirer has bought nine-tenths of the shares it bid for, it can, within four months of the original offer, insist that the remaining shareholders sell at the final offer price.

If the bid has lapsed or not been declared unconditional the bidder cannot bid again for a 12-month period. However, the bidder is allowed to bid again if a bid is made by another company or the bidders renewed offer is recommended by the target management.

The flexibility of the self-regulatory system is seen in Exhibit 12.3 where the standard bidding rules were laid aside to allow an auction approach to the purchase of Debenhams. Under the 'accelerated auction' rules, introduced in 2002, if, after the standard 46-day offer period, rival bidders remain, each will be given a day to respond to the other's bid for a few days, then final sealed bids decide the fate of the target.

## Takeover Panel sets rules for Debenhams fight

Alison Smith

The Takeover Panel yesterday set the stage for further offers in the long-running bid tussle for Debenhams, as it revealed how the two private equity rivals for the group could battle it out to a conclusion by early November.

Yesterday the group's shares closed up 1/2p at 472 1/4p, well ahead of the recommended offer by Baroness Retail at 455p a share, which values the company at £1.66bn. Baroness is led by CVC Capital Partners and Texas Pacific Group.

It looks likely that Laragrove, the consortium led by Permira which

launched a £1.54bn bid in May, will make a higher offer. ...

... The Panel's procedure sets an auction start date of 4pm on October 31, with any higher offer to be announced at 5pm. The lower bidder in each round will be able to revise its bid by 4pm the following day for announcement an hour later.

If the contest has not been decided by Monday November 3, both sides will be invited to submit final sealed bids by 1pm the following day.

### EXHIBIT 12.3 Takeover Panel sets rules for Debenhams' takeover

Source: *Financial Times* 15 October 2003

## Defense tactics

Roughly one-half of UK hostile bids are unsuccessful. Here are a few of the tactics employed by target managers to prevent a successful bid or to reduce the chances of a bid occurring.

### Before bidding starts

- **Eternal vigilance** Be the most effective management team and educate shareholders about your abilities and the firm's potential. Cultivate good relationships with unions, work force and politicians. Polish social image.
- **Defensive investments** Your firm buys a substantial proportion of the shares in a friendly firm, and it has a substantial holding of your shares.
- **Forewarned is forearmed** Keep a watch on the share register for the accumulation of shares by a potential bidder.

### After bidding has started

- **Attack the logic of the bid** Also attack the quality of the bidder's management.
- **Improve the image of the firm** Use revaluation, profit projections, dividend promises, public relations consultants.
- **Attack the value creating (destroying) record of the bidder.**
- **Try to get an OFT block or Competition Commission inquiry.**
- **Encourage unions, the local community, politicians, customers and suppliers to lobby on your behalf.**
- **White Knight** Invite a second bid from a friendly company.
- **Lobby your major shareholders.**
- **Buy another business to make the firm too big or incompatible with the bidder.**
- **Arrange a management buyout of your company.**
- **Begin litigation against the bidder** Bidders sometimes step over the legal boundary in their enthusiasm – e.g. false statements, gaining private information – a court case could be embarrassing.
- **Employee share ownership plans (ESOPs)** These can be used to buy a substantial stake in the firm and may make it more difficult for a bidder to take it over.
- **Share repurchase** Reduces the number of shares available in the market for bidders.

The following tactics are likely to be frowned upon or banned by the Takeover Panel in the UK, but are used in the USA and in a number of continental European countries.

- **Poison pills** Make yourself unpalatable to the bidder by ensuring additional costs should it win – for example, target shareholders are allowed to buy shares in target or acquirer at a large discount should a bid be successful (not possible in the UK).
- **Crown jewels defense** Sell off the most attractive parts of the business.
- **Pac-Man defense** Make a counter-bid for the bidder.
- **Asset lock-up** A friendly buyer purchases those parts of the business most attractive to the bidder.
- **Stock lock-up (White squire)** Target shares are issued to a friendly company or individual(s).
- **Golden parachutes** Managers get massive pay-offs if the firm is taken over.
- **Give in to greenmail** Key shareholders try to obtain a reward (for example, the repurchase of their shares at premium) from the company for not selling to a hostile bidder or for not becoming a bidder themselves. (Green refers to the color of a US dollar.)
- **Limit voting rights** In some European states the management have the ability to limit voting rights to say a maximum of 15 percent regardless of the actual share holding.

## Paying for the target's shares

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Table 11.1 in Chapter 11 showed the relative importance of alternative methods of paying for the purchase of shares in another company over three decades. The relative popularity of each method has varied considerably over the years but in most years cash is the most attractive option, followed by shares, and finally the third category, comprising mostly debentures, loan stocks, convertibles and preference shares.

The figures given in Table 11.1 tend to give a slightly distorted view of the financial behavior of acquiring firms. In many cases where cash is offered to the target shareholders the acquirer does not borrow that cash or use cash reserves. Rather, it raises fresh funds through a rights issue of shares before the takeover bid.

The table may also be misleading in the sense that a substantial proportion of mergers do not fall neatly into the payment categories. Many are mixed bids, providing shareholders of the target firms with a variety of financial securities or offering them a choice in the consideration they wish to receive, for example cash or shares, shares or loan stock. This is designed to appeal to the widest range of potential sellers.

### Cash

One of the advantages of using cash for payment is that the acquirer's shareholders retain the same level of control over their company. That is, new shareholders from the target have not suddenly taken possession of a proportion of the acquiring firm's voting rights, as they would if the target shareholders were offered shares in the acquirer. Sometimes it is very important to shareholders that they maintain control over a company by owning a certain proportion of the firm's shares. Someone who has a 50.1 percent stake may resist attempts to dilute that holding to 25 percent even though the company may more than double in size.

The second major advantage of using cash is that its simplicity and preciseness give a greater chance of success. The alternative methods carry with them some uncertainty about their true worth. Cash has an obvious value and is therefore preferred by vendors, especially when markets are volatile.

From the point of view of the target's shareholders, cash has the advantage – in addition to being more certain in its value – that it also allows the recipients to spread their investments through the purchase of a wide-ranging portfolio. The receipt of shares or other securities means that the target shareholder either keeps the investment or, if diversification is required, has to incur transaction costs associated with selling the shares.

A disadvantage of cash to the target shareholders is that they may be liable for capital gains tax. This is payable when a gain is 'realized'. If the target shareholders receive cash on shares which have risen in value they may pay tax at

their marginal rate: in the UK if they are 22 percent taxpayers on the last pound earned they will pay 22 percent on the gain; if they are 40 percent taxpayers they pay 40 percent on the gain (although the amount payable can be reduced by holding shares for a long period). If, on the other hand, the target shareholders receive shares in the acquiring firm then their investment gain is not regarded as being realized, so no capital gains tax is payable at that time. The tax payment will be deferred until the time of the sale of the new shares – assuming an overall capital gain is made. (Note that some investment funds, e.g. pension funds do not pay CGT and so this problem does not arise. Also, CGT can be reduced by tax free allowances, taper relief and capital losses on other investments and so many shareholders will not consider CGT a burden.)

In certain circumstances the Takeover Panel insists on a cash offer or a cash alternative to an all-share offer.

One further consideration: borrowing cash that is then paid out for the targets shares may be a way of adjusting the financial gearing (debt to equity ratio) of the firm. On the other hand, the firm may already have high borrowings and be close to breaching loan covenants and so is reluctant to borrow more.

## Shares

There are two main advantages to target shareholders of receiving shares in the acquirer rather than cash. First, capital gains tax can be postponed because the investment gain is not realized. Second, they maintain an interest in the combined entity. If the merger offers genuine benefits the target shareholders may wish to own part of the combined entity.

To the acquirer, an advantage of offering shares is that there is no immediate outflow of cash. In the short term, this form of payment puts less pressure on cash flow. However the firm may consider the effect on the capital structure of the firm and the dilution of existing shareholders' positions – *see* Exhibit 12.4.

A second reason for using shares as the consideration is that the price–earnings ratio (PER) game can be played. Through this companies can increase their earnings per share (EPS) by acquiring firms with lower PERs than their own. The share price can rise (under certain conditions) despite there being no economic value created from the merger.

Imagine two firms, Crafty plc and Sloth plc. Both earned £1m last year and had the same number of shares. Earnings per share on an historic basis are identical. The difference between the two companies is the stock market's perception of earnings growth. Because Crafty is judged to be a dynamic go-ahead sort of firm with management determined to improve earnings per share by large percentages in future years it is valued at a high PER of 20.

Sloth, on the other hand, is not seen by investors as a fast-moving firm. It is considered to be rather sleepy. The market multiplies last year's earnings per share by only a factor of 10 to determine the share price – *see* Table 12.1.



## Vodafone's winning formula is now seen as a recipe for producing wrong numbers

**£113bn takeover was once hailed as a smart move. Not any more, says Dan Roberts**

The end of telecommunications investment bubble has put many of last year's takeovers and mergers under the spotlight.

Now attention is turning towards the biggest of them all – Vodafone's £113bn takeover of Mannesmann.

It had looked smart compared with deals struck by rivals such as British Telecommunications because it used highly-rated shares as currency rather than saddling Vodafone with unsustainable debt as a result of paying cash.

Assembling the world's biggest mobile phone company to provide mobile internet access seemed a winning formula.

But renewed scepticism about the growth potential of mobile internet serv-

ices has led investors to question whether Mannesmann, and Vodafone's string of other acquisitions over the last 18 months, were worth the fourfold dilution of existing shareholders' holdings.

Vodafone shares have fallen 18 per cent since it produced its annual results on May 29, underperforming the sector as analysts have reduced forecasts. Its market capitalisation this week fell below £100bn – at the peak it was £270bn – with the shares at their lowest since October 1998.

Some of the pricing pressure reflects a share overhang, with recipients of Vodafone paper cashing in.

### EXHIBIT 12.4 Vodafone: Producing wrong numbers

Source: *Financial Times*, 28 June 2001

TABLE 12.1

#### Illustration of the price to earnings ratio game – Crafty and Sloth

	Crafty	Sloth
Current earnings	£1m	£1m
Number of shares	10m	10m
Earnings per share	10p	10p
Price to earnings ratio	20	10
Share price	£2	£1

Because Crafty's shares sell at a price exactly double that of Sloth it would be possible for Crafty to exchange one of its shares for two of Sloth's. (This is based on the assumption that there is no bid premium, but the argument that follows works just as well even if a reasonable bid premium is paid.)

If Crafty buys all the shares in Sloth its share capital rises by 50 percent, from ten million shares to 15 million shares. However EPS are one-third higher. If the stock market still puts a high PER on Crafty's earnings, perhaps because

investors believe that Crafty will liven up Sloth and produce high EPS growth because of their more dynamic management, then the value of Crafty increases and Crafty's shareholders are satisfied.

Each old shareholder in Crafty has experienced an increase in earnings per share and a share price rise of 33 percent. Also, previously Sloth's shareholders owned £10m of shares in Sloth; now they own £13.33m of shares (*see* Table 12.2).

**TABLE 12.2**  
**Crafty after an all-share merger with Sloth**

	Crafty
Earnings	£2m
Number of shares	15m
Earnings per share	13.33p
Price to earnings ratio	20
Share price	267p

This all seems rational and good, but shareholders are basing their valuations on the assumption that managers will deliver on their promise of higher earnings growth through operational efficiencies, etc. Managers of companies with high PER may see an easier way of increasing EPS and boosting share price. Imagine you are managing a company which enjoys a high PER. Investors in your firm are expecting you to produce high earnings growth. You could try to achieve this through real entrepreneurial and/or managerial excellence, for example by product improvement, achieving economies of scale, increased operating efficiency, etc. Alternatively you could buy firms with low PERs and not bother to change operations. In the long run you know that your company will produce lower earnings because you are not adding any value to the firms that you acquire, you are probably paying an excessive bid premium to buy the present earnings and you probably have little expertise in the new areas of activity.

However, in the short run, EPS can increase dramatically. The problem with this strategy is that to keep the earnings on a rising trend you must continue to keep fooling investors. You have to keep expanding at the same rate to receive regular boosts. One day expansion will stop; it will be revealed that the underlying economics of the firms bought have not improved (they may even have worsened as a result of neglect), and the share price will fall rapidly. This is another reason to avoid placing too much emphasis on short-term EPS figures. The Americans call this the boot strap game. It can be very lucrative for some managers who play it skilfully. However there can be many losers – society, shareholders, employees.

There are some significant dangers in paying shares for an acquisition, as Buffett makes clear in Exhibit 12.5.

## Wealth for shareholders from mergers: the view of Warren Buffett

Our share issuances follow a simple basic rule: we will not issue shares unless we receive as much intrinsic business value as we give. Such a policy might seem axiomatic. Why, you might ask, would anyone issue dollar bills in exchange for fifty-cent pieces? Unfortunately, many corporate managers have been willing to do just that.

The first choice of these managers in making acquisitions may be to use cash or debt. But frequently the CEO's cravings outpace cash and credit resources (certainly mine always have). Frequently, also, these cravings occur when his own stock [shares] is selling far below intrinsic business value. This state of affairs produces a moment of truth. At that point, as Yogi Berra has said, 'You can observe a lot just by watching.' For shareholders then will find which objective the management truly prefers – expansion of domain or maintenance of owners' wealth.

The need to choose between these objectives occurs for some simple reasons. Companies often sell in the stock market below their intrinsic business value. But when a company wishes to sell out completely, in a negotiated transaction, it inevitably wants to – and usually can – receive full business value in whatever kind of currency the value is to be delivered. If cash is to be used in payment, the seller's calculation of value received couldn't be easier. If stock [shares] of the buyer is to be currency, the seller's calculation is still relatively easy: just figure the market value in cash of what is to be received in stock.

Meanwhile, the buyer wishing to use his own stock as currency for the purchase has no problems if the stock is selling in the market at full intrinsic value.

But suppose it is selling at only half intrinsic value. In that case, the buyer is faced with the unhappy prospect of

using a substantially undervalued currency to make its purchase.

Ironically, were the buyer to instead be a seller of its entire business, it too could negotiate for, and probably get, full intrinsic business value. But when the buyer makes a partial sale of itself – *and that is what the issuance of shares to make an acquisition amounts to* – it can customarily get no higher value set on its shares than the market chooses to grant it.

The acquirer who nevertheless barges ahead ends up using an undervalued (market value) currency to pay for a fully valued (negotiated value) property. In effect, the acquirer must give up \$2 of value to receive \$1 of value. Under such circumstances, a marvelous business purchased at a fair sales price becomes a terrible buy. For gold valued as gold cannot be purchased intelligently through the utilization of gold – or even silver – valued as lead.

If, however, the thirst for size and action is strong enough, the acquirer's manager will find ample rationalizations for such a value-destroying issuance of stock. Friendly investment bankers will reassure him as to the soundness of his actions. (Don't ask the barber whether you need a haircut.)

A few favorite rationalizations employed by stock-issuing managements follow:

(a) 'The company we're buying is going to be worth a lot more in the future.' (Presumably so is the interest in the old business that is being traded away; future prospects are implicit in the business valuation process. If 2X is issued for X, the imbalance still exists when both parts double in business value.)

(b) 'We have to grow.' (Who, it might be asked, is the 'We'? For present shareholders, the reality is that all existing businesses shrink when shares are

issued. Were Berkshire to issue shares tomorrow for an acquisition, Berkshire would own everything that it now owns plus the new business, but *your* interest in such hard-to-match businesses as See's Candy Shops, National Indemnity, etc. would automatically be reduced. If (1) your family owns a 120-acre farm and (2) you invite a neighbor with 60 acres of comparable land to merge his farm into an equal partnership – with you to be managing partner, then (3) your managerial domain will have grown to 180 acres but you will have permanently shrunk by 25% your family's ownership interest in both acreage and crops. Managers who want to expand their domain at the expense of owners might better consider a career in government.) ...

... There are three ways to avoid destruction of value for old owners when shares are issued for acquisitions. One is to have a true business-value-for-business-value merger, ... Such a merger attempts to be fair to shareholders of *both* parties, with each receiving just as much as it gives in terms of intrinsic business value ... It's not that acquirers wish to avoid such deals, it's just that they are very hard to do.

The second route presents itself when the acquirer's stock sells at or above its intrinsic business value. In that situation, the use of stock as currency actually may enhance the wealth of the acquiring company's owners ...

... The third solution is for the acquirer to go ahead with the acquisition, but then subsequently repurchase a quantity of shares equal to the number issued in the merger. In this manner, what originally was a stock-for-stock merger can be converted, effectively, into a cash-for-stock acquisition. Repurchases of this kind are damage-repair moves. Regular readers will correctly guess that we much prefer repurchases that directly enhance the wealth of owners instead of repurchases that merely repair

previous damage. Scoring touchdowns is more exhilarating than recovering one's fumbles.

The language utilized in mergers tends to confuse the issues and encourage irrational actions by managers. For example, 'dilution' is usually carefully calculated on a pro forma basis for both book value and current earnings per share. Particular emphasis is given to the latter item. When that calculation is negative (dilutive) from the acquiring company's standpoint, a justifying explanation will be made (internally, if not elsewhere) that the lines will cross favorably at some point in the future. (While deals often fail in practice, they never fail in projections – if the CEO is visibly panting over a prospective acquisition, subordinates and consultants will supply the requisite projections to rationalize any price.) Should the calculation produce numbers that are immediately positive – that is, anti-dilutive – for the acquirer, no comment is thought to be necessary.

The attention given this form of dilution is overdone: current earnings per share (or even earnings per share of the next few years) are an important variable in most business valuations, but far from all-powerful.

There have been plenty of mergers, non-dilutive in this limited sense, that were instantly value-destroying for the acquirer. And some mergers that have diluted current and near-term earnings per share have in fact been value-enhancing. What really counts is whether a merger is dilutive or anti-dilutive in terms of intrinsic business value (a judgment involving consideration of many variables). We believe calculation of dilution from this viewpoint to be all-important (and too seldom made).

A second language problem relates to the equation of exchange. If Company A announces that it will issue shares to merge with Company B, the process is customarily described as

'Company A to Acquire Company B', or 'B Sells to A'. Clearer thinking about the matter would result if a more awkward but more accurate description were used: 'Part of A sold to acquire B' or 'Owners of B to receive part of A in exchange for their properties'. In a trade, what you are giving is just as important as what you are getting ...

... Managers and directors might sharpen their thinking by asking themselves if they would sell 100% of their business on the same basis they are being asked to sell part of it. And if it isn't smart to sell all on such a basis, they should ask themselves why it is smart to sell a portion. A cumulation of small managerial stupidities will produce a major stupidity – not a major triumph. (Las Vegas has been built upon the wealth transfers that occur when people engage in seemingly-small disadvantageous capital transactions.) ...

... Finally, a word should be said about the 'double whammy' effect upon

owners of the acquiring company when value-diluting stock issuances occur. Under such circumstances, the first blow is the loss of intrinsic business value that occurs through the merger itself. The second is the downward revision in market valuation that, quite rationally, is given to that now-diluted business value. For current and prospective owners understandably will not pay as much for assets lodged in the hands of a management that has a record of wealth-destruction through unintelligent share issuances as they will pay for assets entrusted to a management with precisely equal operating talents, but a known distaste for anti-owner actions. Once management shows itself insensitive to the interests of owners, shareholders will suffer a long time from the price/value ratio afforded their stock (relative to other stocks), no matter what assurances management gives that the value-diluting action taken was a one-of-a-kind event.

### EXHIBIT 12.5 Wealth for shareholders from mergers

Source: Warren Buffett's letter to shareholders in the *Berkshire Hathaway Annual Report 1982*

## Other types of finance

Alternative forms of consideration including debentures, loan stock, convertibles and preference shares (described in Chapters 16 and 17) are unpopular, largely because of the difficulty of establishing a rate of return on these securities that will be attractive to target shareholders. Also, these securities often lack marketability and voting rights over the newly merged company.

## Conclusion

**The bid process is fairly complex with rules to be obeyed by both the bidder and the target.**

The bid process is fairly complex with rules to be obeyed by both the bidder and the target. It is understandable that many company managements feel the necessity of holding hands with the experts in the investment banks. Be careful though; the cost of this

advice can be exorbitant. It is interesting that Philip Green, the billionaire owner of BHS and Arcadia, generally prefers to talk directly with the manage-

ment and shareholders of potential targets rather than pay M&A specialists to suggest strategic moves, analyze and negotiate for him, speeding up the process and saving money – when you are using your own money the pain of the £1m check is more acutely felt – although he brings the bankers in for specific tasks later.

Investment banks can be useful for key activities, including certain stages in the negotiations. They can advise on the type of finance to be used to purchase the target's shares. More significantly, they can assist with the raising of fresh funds, e.g. a bond or share issue – the underwriting fees on these can be high, so be wary of signing blank checks. They can guide you through the Takeover Panel rules. Finally, the City experts may be able to help with the valuation of the target. The next chapter will allow you to understand the rationale and drawbacks of the techniques they are likely to use.

## Websites

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<a href="http://www.berkshirehathaway.com">www.berkshirehathaway.com</a>	Berkshire Hathaway
<a href="http://www.ft.com">www.ft.com</a>	Financial Times
<a href="http://www.kpmg.co.uk">www.kpmg.co.uk</a>	KPMG
<a href="http://www.londonstockexchange.com">www.londonstockexchange.com</a>	London Stock Exchange
<a href="http://www.thetakeoverpanel.org.uk">www.thetakeoverpanel.org.uk</a>	The Takeover Panel
<a href="http://www.competition-commission.org.uk">www.competition-commission.org.uk</a>	Competition Commission
<a href="http://www.offt.gov.uk">www.offt.gov.uk</a>	Office of Fair Trading

## Notes

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- 1 This was actually negotiated between the OFT and Morrisons following the Competition Commission's ruling.
- 2 Or if the purchases are immediately before the buyer announces a firm intention to make an offer if the offer is agreed by the target Board.
- 3 If an offer is revised all shareholders who accepted an earlier offer are entitled to the increased payment.
- 4 If 90 percent of the target shares are offered, the bidder must proceed (unless there has been a material adverse change of circumstances). At lower levels of acceptance, it has a choice of whether to declare unconditionality.



## VALUING COMPANIES

**Introduction**

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**The two skills**

---

**Valuation using net asset value**

---

**Income flow is the key**

---

**Dividend valuation methods**

---

**How do you estimate future growth?**

---

**Price-earnings ratio model**

---

**Valuation using cash flow**

---

**Valuing unquoted shares**

---

**Unusual companies**

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**Managerial control changes the valuation**

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**Conclusion**

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## Introduction

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Managers must become acquainted with the main influences on the valuation of entire companies and how to value individual shares in companies. If they are to be given the responsibility of maximizing the wealth of shareholders managers need knowledge of the factors influencing that wealth, as reflected in the share price of their own company. Without this understanding they will be unable to determine the most important consequence of their actions – the impact on share value. Managers need to appreciate share price derivation because the

**Managers need to appreciate share price derivation because the change in their company's share value is one of the key factors by which they are judged.**

change in their company's share value is one of the key factors by which they are judged. It is also useful for them to know how share prices are set if the firm plans to gain a flotation on a stock exchange, or when it is selling a division to another firm. In mergers an acquirer needs good valuation skills so as not to pay more than necessary, and a seller needs to ensure that the price is fair.

This chapter describes the main methods of valuing shares: net asset value, dividend valuation models, price earnings ratio models and cash flow models. There is an important subsection in the chapter that shows how the valuation of shares differs if the purchase would give managerial control from the valuation of shares which provide only a small minority stake.

## The two skills

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Two skills are needed to be able to value shares. The first is analytical ability, to be able to understand and use mathematical valuation models. Second, and most importantly, good judgment is needed, because the majority of the inputs to the mathematical calculations are factors, the precise nature of which cannot be defined with absolute certainty, so great skill is required to produce reasonably accurate results. The main problem is that the determinants of value occur in the future, for example future cash flows, dividends or earnings.

The monetary value of an asset is what someone is prepared to pay for it. Assets such as cars and houses are difficult enough to value with any degree of accuracy. At least corporate bonds generally have a regular cash flow (coupon) and an anticipated capital repayment. This contrasts with the uncertainties associated with shares, for which there is no guaranteed annual payment and no promise of capital repayment. The difficulties of share valuation are amply represented by the case of Amazon.com in case study 13.1.

**The monetary value of an asset is what someone is prepared to pay for it.**

### Case study 13.1

#### Amazon.com

Amazon, the internet retailer, has never made a profit. In fact it lost over \$700m in 1999 and offered little prospect of profits in the near term. So, if you were an investor in early 2000 what value would you give to a company of this caliber? Anything at all? Amazingly, investors valued Amazon at over \$30bn in early 2000 (more than all the traditional book retailers put together). The brand was well established and the numbers joining the online community rose by thousands every day. Investors were confident that Amazon would continue to attract customers and produce a rapid rate of growth in revenue. Eventually, it was thought, this revenue growth would translate into profits and high dividends. When investors had calmed down after taking account of the potential for competition and the fact that by 2001 Amazon was still not producing profits, they reassessed the value of Amazon's likely future dividends. In mid-2001, they judged the company to be worth only \$4bn – it had run up losses of \$1.4bn in 2000, indicating that profits and dividends were still a long way off. However by 2004 the company, despite reporting yet another loss in 2003, was thought to be close to being able to turn its brand into profits for shareholders, so it was valued at over \$20bn. Maybe it will.

## Valuation using net asset value (NAV)

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The balance sheet seems an obvious place to start when faced with the task of valuation. In this method the company is viewed as being worth the sum of the value of its net assets. The balance sheet is regarded as providing objective facts concerning the company's ownership of assets and obligations to creditors. Here fixed assets are recorded along with stocks, debtors, cash and other liquid assets. With the deduction of long-term and short-term creditors from the total asset figure we arrive at the net asset value (NAV).

An example of this type of calculation is shown in Table 13.1 for Cadbury Schweppes.

The NAV of over £3bn of Cadbury Schweppes compares with a market value placed on all the shares when totaled of £8.5bn (market capitalization figures are available in Monday editions of the *Financial Times*). This great difference makes it clear that the shareholders of Cadbury Schweppes are not rating the firm on the basis of balance sheet net asset figures. This point is emphasized by an examination of Table 13.2.

Three of the four firms listed in Table 13.2 have very small balance sheet values in comparison with their total market capitalization. The exception is Vodafone which boosted its balance sheet by buying many other companies producing over £90bn intangible assets in the form of goodwill (amount paid for target above the fair value of the assets acquired).

For most companies, investors look to the income flow to be derived from a holding. This flow is generated when the balance sheet assets are combined with assets impossible to quantify: these include the unique skills of the work-

**TABLE 13.1****Cadbury Schweppes Abridged Balance Sheet 29 December 2002**

	£m
Fixed assets	5,815
Current assets	
Stocks	528
Debtors falling due within one year	970
Debtors falling due after more than one year	82
Investments	297
Cash at bank and in hand	<u>175</u>
	2,052
Creditors: Amounts falling due within one year	(2,585)
Creditors: Amounts falling due after more than one year	(1,577)
Provisions for liabilities and charges	<u>(419)</u>
Net assets	<u>3,286</u>
Shareholders' funds	3,020

Source: Cadbury Schweppes plc Report & Accounts 2002

**TABLE 13.2****Net asset values and total capitalization of some firms**

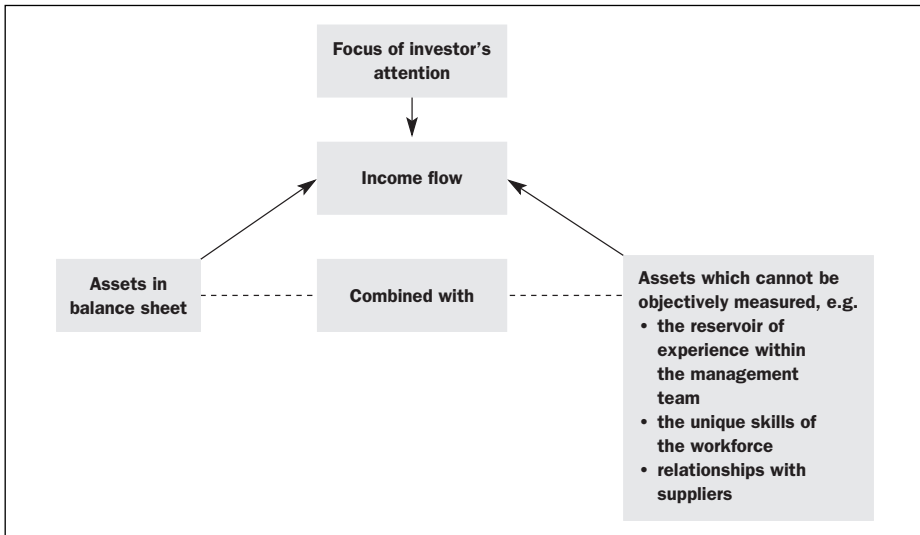
Company (Accounts year)	NAV £m	Total capitalization (market value of company's shares) £m
GlaxoSmithKline (2002)	7,388	77,306
Unilever (2002)	3,816	29,764
EMI (2002)	Negative 889	1,305
Vodafone (2002)	133,428	95,109

Source: Annual reports and accounts; *Financial Times*, 5 January 2004

force, the relationships with customers and suppliers, the value of brands, the reservoir of experience within the management team, and the competitive positioning of the firms' products. Assets, in the crude sense of balance sheet values, are only one dimension of overall value. Investors in the market generally value intangible, unmeasurable assets more highly than those that can be identified and recorded by accountants.

**Investors in the market generally value intangible, unmeasurable assets more highly than those that can be identified and recorded by accountants.**

Criticizing accountants for not producing balance sheets which reflect the true value of a business is unfair. Accounts are not usually designed to record up-to-date market values. Land and buildings are frequently shown at cost rather than market value; thus

**FIGURE 13.1****What creates value for shareholders?**

the balance sheet can provide a significant over- or under-valuation of these assets' current value. Plant and machinery is shown at the purchase price less a depreciation amount. Stock is valued at the lower of cost or net realizable value – this can lead to a significant under-estimate, as the market value can appreciate to a figure far higher than either of these. The list of balance sheet entries vulnerable to subjective estimation, arbitrary method and even cynical manipulation is a long one: goodwill, provisions, merger accounting, debtors, intangible brand values and so on.

The slippery concept of balance sheet value is demonstrated in the article about Hanson reproduced in Exhibit 13.1.

### **When asset values are particularly useful**

The accounts-based approach to share value is fraught with problems but there are circumstances in which asset backing is correctly given more attention.

#### **Firms in financial difficulty**

The shareholders of a firm in financial difficulty may pay a great deal of attention to the asset backing of the firm. They may weigh up the potential for asset sales or asset-backed borrowing. In extreme circumstances they may try to assess the break-up value.

#### **Takeover bids**

In a takeover bid shareholders will be reluctant to sell at less than NAV even if the prospect for income growth is poor. A standard defensive tactic in a takeover battle is to revalue balance sheet assets to encourage a higher price.

## Hanson cuts asset value by £3.2bn

Tim Burt

Hanson, the industrial conglomerate, yesterday marked the latest stage of its four-way demerger by announcing a £3.2bn reduction in assets following accounting changes and write-downs in the value of its US mineral reserves.

The write-downs at Peabody, the largest coal producer in the US, and Hanson's Cornerstone aggregates subsidiary will bring the company into line with US accounting standards on the treatment of 'long lived assets'.

Mr Derek Bonham, chief executive, said the move would have no impact on operational cash flow and added: 'It in no way reflects on the accuracy of previous accounts.'

Some industry analysts, however, suggested Hanson might have overval-

ued the assets of both Peabody and Cornerstone in the past – a charge rejected by the company.

In total, the book value of mineral reserves at Cornerstone have been reduced by £2.3bn to £1.3bn and by £600m at Peabody to £1.5bn. A further £300m charge is being made against Peabody's reserves to cover accounting changes over industry liabilities.

As part of the accounting changes, Hanson has removed £1.2bn of its £1.5bn provisions from Peabody's balance sheet and plans to charge £300m of previous payments to profit and loss reserves. Mr Bonham said this move would cut the carrying value of Peabody's coal reserves by £1.5bn.

### EXHIBIT 13.1 Hanson cuts asset value

Source: *Financial Times* 9 July 1996

### When discounted income flow techniques are difficult to apply

For some types of company there is no straightforward way of employing income-flow based methods:

#### *Property investment companies*

These are primarily valued on the basis of their assets. It is generally possible to put a fairly realistic up-to-date price on the buildings owned by such a company. These market values have a close link to future cash flows. That is, the future rents payable by tenants, when discounted, determine the value of property assets and thus the company. If higher rent levels are expected than were previously anticipated, chartered surveyors will place a higher value on the asset, and the NAV in the balance sheet will rise, forcing up the share price. For such companies, future income, asset values and share values are all fairly closely linked. However, as Exhibit 13.2 makes clear, while share price and NAV generally go up and down together, there are good reasons for property investment company shares to trade at less than NAV.

### Investment trusts

The future income of investment trusts comes from the individual shareholders. The shareholder in a trust would find it extremely difficult to calculate the future income to be received from each of the dozens or hundreds of shares held. An easier approach is simply to take the current share price of each holding as representing the future discounted income. The share values are aggregated to derive the trust's NAV and this has a strong bearing on the price at which the trust shares are traded.

## When net asset value is no guide

Norma Cohen

The directors of Asda Property face a dilemma – do they recommend shareholders to accept a bid that is significantly below the company's 'value' or do they urge them to accept it on the grounds that it is the best offer they are likely to get?

If the offer is accepted, what does the concept of net asset value really mean?

If the offer is rejected, does that mean NAV is a concept that has no relevance to share price?

Last week, the directors – not including the executive chairman and founder, Manny Davidson – initiated a 'first' for the quoted property sector, seeing off a bid approach of 280p that was deemed too low. Similar bids for other property companies have been accepted almost without question.

But yesterday's renewed offer of 298.6p, along with the latest 1.4p interim dividend, now requires pause for thought. Asda's current situation is awkward. ...

... In rejecting the initial offer, Asda's directors point to the latest interim valuation of 383p, including 6p on the development portfolio.

In justifying its offer, BL Davidson, the joint venture, points to the 60p per share capital gains tax the company would incur on the sale of its assets,

along with further deductions for paying off high interest rate debt. After these deductions, NAV falls to 308p, not far off its offer price. ...

... But if a company is not to be valued at its break-up value, what sort of price should you put on it?

NAV is an interesting number because, in its pure form, it takes no account of the break-up costs. But equally, it takes no account of the cost of remaining a going concern.

Indeed, NAV is a number that pretends there is no cost associated with corporate ownership and management of real estate – a patent nonsense.

For one thing, there are general overhead and administrative costs; for another, there is depreciation expense. Although the latter never appears in corporate profit and loss accounts, there is ample evidence it exists.

Unrecoverable property management and refurbishment costs are, in effect, disguised forms of depreciation expense.

A more 'true' picture would emerge if analysts could count the net present value of those costs and deduct them from the NAV.

Arguably, this is what the market does already. Indeed, it may explain the staggering range of discounts to NAV at which property company shares trade.

### EXHIBIT 13.2 When net asset value is no guide

Source: *Financial Times* 17 August 2001

**Resource-based companies**

For oil companies, mineral extractors, mining houses and so on, the proven or probable reserves have a significant influence on the share price (*see* Exhibit 13.3).

**Income flow is the key**

The value of a share is usually determined by the income flows that investors expect to receive in the future from its ownership. Information about the past is only of relevance to the extent that it contributes to an understanding of expected future performance. Income flows will occur at different points in the future and so they have to be discounted. There are three classes of income valuation models:

- dividend-based models
- earnings-based models
- cash flow-based models.

**Dividend valuation methods**

The dividend valuation models (DVMs) are based on the premise that *the market value of ordinary shares represents the sum of the expected future dividend flows, to infinity, discounted to present value.*

The only cash flows that investors ever receive from a company are dividends. This holds true if we include a 'liquidation dividend' upon the sale of the firm or on formal liquidation, and any share repurchases can be treated as dividends. Of

**NAV valuation sparks dispute**

Timon Day

A row had broken out between oil company LASMO and HSBC Securities over the broker's sharp cut in its estimation of LASMO's net asset value from 132p to 98p a share. It knocked £48m off LASMO's stock market value driving its shares down 5p to 123p. This is a particularly sensitive time because LASMO is in the middle of an all-share offer for Monument Oil & Gas – whose former broker is HSBC ...

Most of the dispute over the valuation centres on Algeria where LASMO has a 12 per cent stake in 14 oil fields operated by US group Anadarko. Mr Perry does not accept LASMO's valuation of between £300m and £500m for its Algerian interests, putting a price of just £210m on them.

**EXHIBIT 13.3 NAV valuation sparks dispute**

Source: *Investors Chronicle*, 11 June 1999

course, an individual shareholder is not planning to hold a share forever to gain the dividend returns to an infinite horizon. An individual holder of shares will expect two types of return:

- income from dividends and
- a capital gain resulting from the appreciation of the share and its sale to another investor.

The fact that the individual investor is looking for capital gains as well as dividends to give a return does not invalidate the models' focus on all dividends to an infinite horizon. The reason for this is that when a share is sold by that investor, the purchaser is buying a future stream of dividends, so the price paid is determined by future dividend expectations.

To illustrate this, consider the following: A shareholder intends to hold a share for one year. A single dividend will be paid at the end of the holding period,  $d_1$  and the share will be sold at a price  $P_1$  in one year.

To derive the value of a share at time 0 to this investor ( $P_0$ ), the future cash flows,  $d_1$  and  $P_1$ , have to be discounted at a rate which includes an allowance for the risk class of the share,  $k_E$ .

$$P_0 = \frac{d_1}{1 + k_E} + \frac{P_1}{1 + k_E}$$

### Example

An investor is considering the purchase of some shares in Willow plc. At the end of one year a dividend of 22p will be paid and the shares are expected to be sold for £2.43. How much should be paid if the investor judges that the rate of return required on a financial security of this risk class is 20 percent?

*Answer*

$$P_0 = \frac{d_1}{1 + k_E} + \frac{P_1}{1 + k_E}$$

$$P_0 = \frac{22}{1 + 0.2} + \frac{243}{1 + 0.2} = 221\text{p}$$

### The dividend valuation model to infinity

The relevant question to ask to understand DVMs is: Where does  $P_1$  come from? The buyer at time 1 estimates the value of the share based on the present value of future income given the required rate of return for the risk class. So if the second investor expects to hold the share for a further year and sell at time 2 for  $P_2$ , the price  $P_1$  will be:

$$P_1 = \frac{d_2}{1 + k_E} + \frac{P_2}{1 + k_E}$$



Returning to the  $P_0$  equation we are able to substitute discounted  $d_2$  and  $P_2$  for  $P_1$ . Thus:

$$P_0 = \frac{d_1}{1 + k_E} + \frac{P_1}{1 + k_E}$$

$$P_0 = \frac{d_1}{1 + k_E} + \frac{d_2}{(1 + k_E)^2} + \frac{P_2}{(1 + k_E)^2}$$

If a series of one-year investors bought this share, and we in turn solved for  $P_2, P_3, P_4$ , etc., we would find:

$$P_0 = \frac{d_1}{1 + k_E} + \frac{d_2}{(1 + k_E)^2} + \frac{d_3}{(1 + k_E)^3} + \dots + \frac{d_n}{(1 + k_E)^n}$$

Even a short-term investor has to consider events beyond his or her time horizon because the selling price is determined by the willingness of a buyer to purchase a future dividend stream. If this year's dividends are boosted by short-termist policies such as cutting out R&D and brand-support marketing the investor may well lose significantly because other investors push down the share price as their forecasts for future dividends are lowered.

### Example

If a firm is expected to pay dividends of 20p per year to infinity and the rate of return required on a share of this risk class is 12% then:

$$P_0 = \frac{20}{1 + 0.12} + \frac{20}{(1 + 0.12)^2} + \frac{20}{(1 + 0.12)^3} + \dots + \frac{20}{(1 + 0.12)^n}$$

$$P_0 = 17.86 + 15.94 + 14.24 + \dots + \dots +$$

Given this is a perpetuity there is a simpler approach:

$$P_0 = \frac{d_1}{k_E} = \frac{20}{0.12} = 166.67\text{p}$$

### The dividend growth model

In contrast to the situation in the above example, for most companies dividends are expected to grow from one year to the next.<sup>1</sup> To make DVM analysis manageable simplifying assumptions are usually made about the patterns of growth in dividends. Most managers attempt to make dividends grow more or less in line with the firm's long-term earnings growth rate. They often bend over backwards

to smooth out fluctuations, maintaining a high dividend even in years of poor profits or losses. In years of very high profits they are often reluctant to increase the dividend by a large percentage for fear that it might have to be cut back in a downturn. So, given management propensity to make dividend payments grow in an incremental or stepped fashion it seems that a reasonable model could be based on the assumption of a constant growth rate. (Year to year deviations around this expected growth path will not materially alter the analysis.)

Given management propensity to make dividend payments grow in an incremental or stepped fashion it seems that a reasonable model could be based on the assumption of a constant growth rate.

### Worked example 13.1

#### A CONSTANT DIVIDEND GROWTH VALUATION: SHHH PLC

If the last dividend paid was  $d_0$  and the next is due in one year,  $d_1$ , then this will amount to  $d_0(1 + g)$  where  $g$  is the growth rate of dividends.

For example, if Shhh plc has just paid a dividend of 10p and the growth rate is 7% then:

$$d_1 \text{ will equal } d_0(1 + g) = 10(1 + 0.07) = 10.7\text{p}$$

and

$$d_2 \text{ will be } d_0(1 + g)^2 = 10(1 + 0.07)^2 = 11.45\text{p}$$

The value of a share in Shhh will be all the future dividends discounted at the risk-adjusted discount rate of 11%:

$$P_0 = \frac{d_0(1 + g)}{1 + k_E} + \frac{d_0(1 + g)^2}{(1 + k_E)^2} + \frac{d_0(1 + g)^3}{(1 + k_E)^3} + \dots + \frac{d_0(1 + g)^n}{(1 + k_E)^n}$$

$$P_0 = \frac{10(1 + 0.07)}{1 + 0.11} + \frac{10(1 + 0.07)^2}{(1 + 0.11)^2} + \frac{10(1 + 0.07)^3}{(1 + 0.11)^3} + \dots + \frac{d_0(1 + g)^n}{(1 + k_E)^n}$$

Using the above formula could require a lot of time. Fortunately it is mathematically equivalent to the following formula,<sup>2</sup> which is much easier to employ.

$$P_0 = \frac{d_1}{k_E - g} = \frac{d_0(1 + g)}{k_E - g} = \frac{10.7}{0.11 - 0.07} = 267.50\text{p}$$

Note that, even though the shortened formula only includes next year's dividend all the future dividends are represented.

A further illustration is provided by the example of Pearson plc.

### Worked example 13.2

#### PEARSON PLC

Pearson plc, the publishing, media and education group, has the following dividend history:

Year	Net dividend per share (p)
1996	16.1
1997	17.4
1998	18.8
1999	20.1
2000	21.4
2001	22.3
2002	23.4

The average annual growth rate,  $g$ , over this period has been:

$$g = \sqrt[6]{\frac{23.4}{16.1}} - 1 = 0.064 \text{ or } 6.4\%$$

If it is assumed that this historic growth rate will continue into the future and 10% is taken as the required rate of return, the value of a share can be calculated.

$$P_0 = \frac{d_1}{k_E - g} = \frac{23.4(1 + 0.064)}{0.10 - 0.064} = 692\text{p}$$

In fact, in early 2004 Pearson's shares stood at 620p. Perhaps analysts were anticipating a slower rate of growth in future than in the past. Perhaps we employed an unreasonably low discount rate given the risks facing the company. Or perhaps the market consensus view of Pearson's growth prospects was over-pessimistic.

### Non-constant growth

Firms tend to go through different phases of growth. If they have a strong competitive advantage in an attractive market they might enjoy super-normal growth. Eventually, however, most firms come under competitive pressure and growth becomes normal. Ultimately, many firms fail to keep pace with the market environmental change in which they operate and growth falls to below that for the average company.

To analyze companies that go through different phases of growth a two-, three- or four-stage model may be used. In the simplest case of two-stage growth the share price calculation requires the adding together of the results of the following:

- Discount each of the forecast annual dividends in the first period to time 0.
- Estimate the share price at the point at which the dividend growth shifts to the new permanent rate. Discount this share price to time 0.

### Worked example 13.3

#### NORUCE PLC

You are given the following information about Noruce plc.

The company has just paid an annual dividend of 15p per share and the next is due in one year. For the next three years dividends are expected to grow at 12% per year. This rapid rate is caused by a number of favorable factors: an economic upturn, the fast acceleration stage of newly developed products and a large contract with a government department.

After the third year the dividends will grow at only 7% per annum, because the main boosts to growth will, by then, be absent.

Shares in other companies with a similar level of systematic risk to Noruce produce an expected return of 16% per annum.

What is the value of one share in Noruce plc?

#### Answer

*Stage 1 Calculate dividends for the super-normal growth phase.*

$$\begin{aligned}d_1 &= 15(1 + 0.12) = 16.8 \\d_2 &= 15(1 + 0.12)^2 = 18.8 \\d_3 &= 15(1 + 0.12)^3 = 21.1\end{aligned}$$

*Stage 2 Calculate share price at time 3 when the dividend growth rate shifts to the new permanent rate.*

$$P_3 = \frac{d_3(1 + g)}{k_E - g} = \frac{21.1(1 + 0.07)}{0.16 - 0.07} = 250.9$$

*Stage 3 Discount and sum the amounts calculated in Stages 1 and 2.*

$$\begin{aligned}\frac{d_1}{1 + k_E} &= \frac{16.8}{1 + 0.16} = 14.5 \\+ \frac{d_2}{(1 + k_E)^2} &= \frac{18.8}{(1 + 0.16)^2} = 14.0 \\+ \frac{d_3}{(1 + k_E)^3} &= \frac{21.1}{(1 + 0.16)^3} = 13.5 \\+ \frac{P_3}{(1 + k_E)^3} &= \frac{250.9}{(1 + 0.16)^3} = \underline{160.7}\end{aligned}$$

202.7p

## What is a normal growth rate?

Growth rates will be different for each company but for corporations taken as a whole dividend growth will not be significantly different from the growth in nominal gross national product (real GNP plus inflation) over the long term. If dividends did grow in a long-term trend above this rate then they would take an increasing proportion of national income – ultimately squeezing out the consumption and government sectors. This is, of course, ridiculous. Thus, in an economy with expected long-term inflation of 3 percent per annum and growth of 2.5 percent, we might expect the long-term growth in dividends to be about 5.5 percent. Also, it is unreasonable to suppose that a firm can grow its earnings and dividends forever at a rate significantly greater than that for the economy as a whole. To do so is to assume that the firm eventually becomes larger than the economy. There will be years, even decades, when average corporate dividends

**There will be years, even decades, when average corporate dividends do grow faster than the economy as a whole.**

do grow faster than the economy as a whole and there will always be companies with much higher projected growth rates than the average for periods of time. Nevertheless the real GNP + inflation growth relationship provides a useful benchmark.

## Companies that do not pay dividends

Some companies, for example Warren Buffett's Berkshire Hathaway, do not pay dividends. This is a deliberate policy as there is often a well-founded belief that the funds are better used within the firms than they would be if the money is given to shareholders. This presents an apparent problem for the DVM but the measure can still be applied because it is reasonable to suppose that one day these companies will start to pay dividends. Perhaps this will take the form of a final break-up payment, or perhaps when the founder is approaching retirement he/she will start to distribute the accumulated resources. At some point dividends must be paid, otherwise there would be no attraction in holding the shares. Microsoft is an example of a company that did not pay a dividend for 28 years. However, in 2003 it decided that it would start a process of payout of some of its enormous pile of cash – see Exhibit 13.4.

Some companies do not pay dividends for many years due to regular losses. Often what gives value to this type of share is the optimism that the company will recover and that dividends will be paid in the distant future.

## Problems with the dividend growth valuation model

Dividend valuation models present the following problems.

- 1 They are highly sensitive to assumptions. Take the case of Pearson above. If we change the growth assumption to 7 percent and reduce the required rate of return to 9.5 percent, the value of the share leaps to over £10.

$$P_0 = \frac{d_1}{K_E - g} = \frac{23.4(1 + 0.07)}{0.095 - 0.07} = 1002p$$

## Microsoft considers dividend of \$10bn-plus

By Emmanuel Paquette in Paris and Richard Waters in San Francisco

Microsoft is considering paying its shareholders a special dividend of 'significantly' more than \$10bn (£6bn), according to a person close to the discussions. This would be the largest corporate pay-out ever, and help reduce its \$46bn cash pile. ...

The software giant has come under increasing pressure from shareholders to release some of its cash pile which has grown as its shares have lagged. A decision made to begin paying a dividend,

which will amount to nearly \$900m this year, will make little impact as it continues to generate \$3bn of cash each quarter. ...

The company said when it originally announced its 8 cents per share dividend – the first paid in its 28-year history – that it would consider raising the pay-out. One option would involve distributing more than \$1 per share at a cost of more than \$10bn.

### Exhibit 13.4 Microsoft considers dividend

Source: *Financial Times* 4 July 2003

- 2 The quality of input data is often poor. The problems of calculating an appropriate required rate of return on equity are discussed in Chapter 10. Added to this is great uncertainty about the future growth rate.
- 3 If  $g$  exceeds  $k_E$  a nonsensical result occurs. This problem is dealt with if an assumption of a short-term super-normal growth rate followed by a lower rate after the super-normal period is replaced with a  $g$  which is some weighted average growth rate reflecting the return expected over the long run. Alternatively, for those periods when  $g$  is greater than  $k$ , one may calculate the specific dividend amounts and discount them as in the non-constant growth model. For the years after the super-normal growth occurs, the usual growth formula may be used.

The difficulties of using the DVMs are real and yet the methods are to be favored, less for the derivation of a single number than for the understanding of the principles behind the value of financial assets that the exercise provides. They demand a disciplined thought process that makes the analyst's assumptions about key variables explicit.

**DVMs demand a disciplined thought process that makes the analyst's assumptions about key variables explicit.**

## How do you estimate future growth?

The most influential variable, and the one subject to most uncertainty, on the value of shares is the growth rate expected in dividends. Accuracy here is a much sought-after virtue. While this book cannot provide readers with a perfect crystal ball for seeing future dividend growth rates, it can provide a few pointers.

## Determinants of growth

Three factors influence the rate of dividend growth.

- *The quantity of resources retained and reinvested within the business* This relates to the percentage of earnings not paid out as dividends. The more a firm invests the greater its potential for growth.
- *The rate of return earned on those retained resources* The efficiency with which retained earnings are used will influence value.
- *Rate of return earned on existing assets* This concerns the amount earned on the existing baseline set of assets, that is, those assets available before reinvestment of profits. This category may be affected by a sudden increase or decrease in profitability. If the firm, for example, is engaged in oil exploration and production, and there is a worldwide increase in the price of oil, profitability will rise on existing assets. Another example would be if a major competitor is liquidated, enabling increased returns on the same asset base due to higher margins because of an improved market position.

There is a vast range of influences on the future return from shares. One way of dealing with the myriad variables is to group them into two categories: at firm and economy level.

### Focus on the firm

A dedicated analyst would want to examine numerous aspects of the firm, and its management, to help develop an informed estimate of its growth potential. These will include the following.

- *Strategic analysis* The most important factor in assessing the value of a firm is its strategic position. We need to consider the attractiveness of the industry, the competitive position of the firm within the industry and the firm's position on the life cycle of value creation to appreciate the potential for increased dividends. (This topic is covered very briefly in Chapter 7. For a fuller discussion consult Arnold (2002) *Valuegrowth Investing* or Arnold (2004) *The Financial Times Guide to Investing*.)
- *Evaluation of management* Running a close second in importance for the determination of a firm's value is the quality of its management. A starting point for analysis might be to collect factual information such as their level of experience and education. But this has to be combined with far more important evaluatory variables which are unquantifiable, such as judgment, and even gut-feeling about issues such as competence, integrity, intelligence and so on. Having honest managers with a focus on increasing the wealth of shareholders is at least as important for valuing shares as the factor of managerial competence. Investors downgrade the shares of companies run by the most brilliant managers if there is any doubt about their integrity – highly competent crooks can destroy shareholder wealth far quicker than any competitive action, just ask the shareholders in WorldCom, Enron and Parmalat. (For a fuller discussion of the impact of managerial competence and integrity on share values, see Arnold (2002).)

- *Using the historical growth rate of dividends* For some firms the past growth may be extrapolated to estimate future dividends. If a company demonstrated a growth rate of 6 percent over the past ten years it might be reasonable to use this as a starting point for evaluating its future potential. This figure may have to be adjusted for new information such as new strategies, management or products – that is the tricky part.
- *Financial statement evaluation and ratio analysis* An assessment of the firm's profitability, efficiency and risk through an analysis of accounting data can be enlightening. However, adjustments to the published figures are likely to be necessary to view the past clearly, let alone provide a guide to the future. Warren Buffett again:

When managers want to get across the facts of the business to you, it can be done within the rules of accounting. Unfortunately when they want to play games, at least in some industries, it can also be done within the rules of accounting. If you can't recognise the differences, you shouldn't be in the equity-picking business.<sup>3</sup>

Accounts are valuable sources of information, but they have three drawbacks:

- they are based in the past when it is the future which is of interest,
- the fundamental value-creating processes within the firm are not identified and measured in conventional accounts, and
- they are frequently based on guesses, estimates and judgments, and are open to arbitrary method and manipulation.

Armed with a questioning frame of mind the analyst can adjust accounts to provide a truer and fairer view of a company. The analyst may wish to calculate three groups of ratios to enable comparisons:

- Internal liquidity ratios permit some judgment about the ability of the firm to cope with short-term financial obligations – quick ratios, current ratios, etc.
- Operating performance ratios may indicate the efficiency of the management in the operations of the business – asset turnover ratio, profit margins, debtor turnover, etc.
- Risk analysis concerns the uncertainty of income flows – sales variability over the economic cycle, operational gearing (fixed costs as a proportion of total), financial gearing (ratio of debt to equity), cash flow ratios, etc.

Ratios examined in isolation are meaningless. It is usually necessary to compare with the industry, or the industry sub-group comprising the firm's competitors. Knowledge of changes in ratios over time can also be useful.

### **Focus on the economy**

All firms, to a greater or lesser extent, are influenced by macroeconomic changes. The prospects for a particular firm can be greatly affected by sudden changes in government fiscal policy, the central bank's monetary policy, changes in exchange rates, etc. Forecasts of macroeconomic variables such as GNP are easy to find, for



example *The Economist* publishes a table of forecasts every week. Finding a forecaster who is reliable over the long term is much more difficult. Perhaps the best approach is to obtain a number of projections and through informed judgment develop a view about the medium-term future. Alternatively, the analyst could recognize that there are many different potential futures and then develop analyses based on a range of possible scenarios – probabilities could be assigned and sensitivity analysis used to provide a broader picture.

It is notable that the great investors pay little attention to macroeconomic forecasts when valuing companies. The reason for this is that value is determined by income flows to the shareholder over many economic cycles stretching over decades, so the economists' projection (even if accurate) for this or that economic number for the next year is of little significance.

## Price-earnings ratio (PER) model

A popular approach to valuing a share is to use the price-to-earnings (PER) ratio. The historic PER compares a firm's share price with its latest earnings (profits) per share. Investors estimate a share's value as the amount they are willing to pay for each unit of earnings. If a company produced earnings per share of 10p in its latest accounts and investors are prepared to pay 20 times historic earnings for this type of share it will be valued at £2.00. The historic PER is calculated as follows:

$$\text{Historic PER} = \frac{\text{Current market share of price}}{\text{Last year's earnings per share}} = \frac{200\text{p}}{10\text{p}} = 20$$

So, the retailer Dixons which reported earnings per share of 10.7p with a share price of £141.75 in January 2004 had a PER of about 13.3 (141.75/10.7p). PERs of other retailers are shown in Table 13.3.

**TABLE 13.3**  
**PERs for retailers**

Retailer	PER
Blacks	14.5
Body Shop	11.4
Boots	14.2
Burberry	22.0
Dixons	13.3
JJB Sport	9.5
Kingfisher	14.9
Marks and Spencer	22.5
Ottakers	30.2
Next	16.2

Source: *Financial Times*, 10/11 January 2004

Investors are willing to buy Burberry's shares at 22 times last year's earnings compared with only 11.4 times last year's earnings for Body Shop. One explanation for the difference in PERs is that companies with higher PERs are expected to show faster growth in earnings in the future. Burberry may appear expensive relative to Body Shop based on historical profit figures but the differential may be justified when forecasts of earnings are made. If a PER is high investors expect profits to rise. This does not necessarily mean that all companies with high PERs are expected to perform to a high standard, merely that they are expected to do significantly better than in the past. Few people would argue that Marks and Spencer has performed, or will perform, well in comparison with Burberry and yet it stands at a higher historic PER, reflecting the market's belief that Marks and Spencer has more growth potential from its low base than Burberry.

**If a PER is high investors expect profits to rise.**

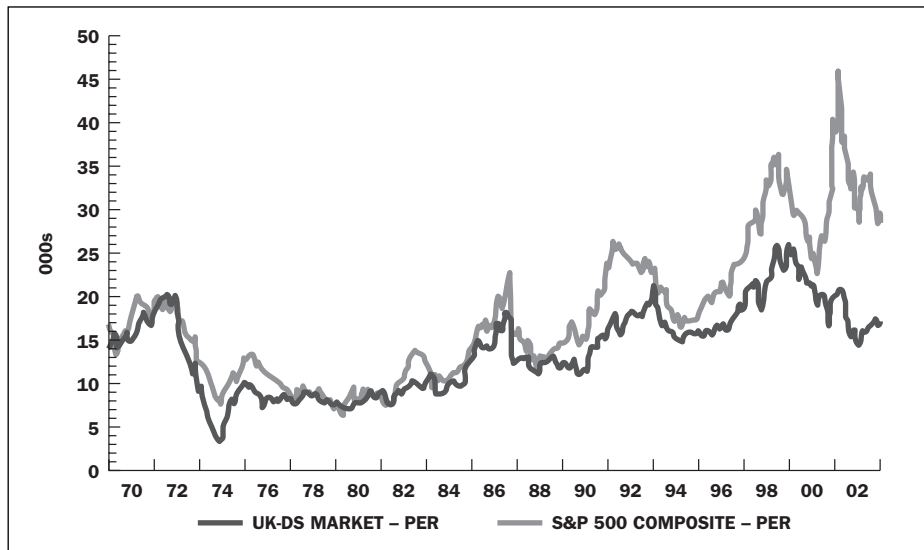
PERs are also influenced by the uncertainty of the future earnings growth. So, perhaps, Dixons and Kingfisher might have the same expected growth rate but the growth at Dixons is subject to more risk and therefore the market assigns a lower earnings multiple.

## PERs over time

There have been great changes over the years in the market's view of what is a reasonable multiple of earnings to place on share prices. What is excessive in one year is acceptable in another. This is illustrated in Figure 13.2.

**FIGURE 13.2**

**PERs for the UK and US (S&P 500) stock markets 1970–2004**



Source: Thomson Financial Datastream

## The crude and the sophisticated use of the PER model

Some analysts use the historic PER ( $P_0/E_0$ ), to make comparisons between firms without making explicit the considerations hidden in the analysis. They have a view of an appropriate PER based on current prevailing PER for other firms in the same industry. So, for example, in 2004 Tesco with a PER of 17.5 may be judged to be priced correctly relative to similar firms – Sainsbury had a PER of 13.3, Morrisons 20.1 and Big Food Group 14. Analyzing through comparisons lacks intellectual rigor.

**Analyzing through comparisons lacks intellectual rigor.**

First, the assumption that the ‘comparable’ companies are correctly priced is a bold one. It is easy to see how the market could be pulled up (or down) by its own bootstraps and lose touch with fundamental considerations by this kind of thinking (say, telecommunication shares in the 1998–2000 bubble). Second, it fails to provide a framework for the analyst to test the important implicit input assumptions – for example, the growth rate expected in earnings in each of the companies, or the difference in required rate of return given the different risk level of each. These elements are probably in the mind of the analyst, but there may be benefits in making these more explicit. This can be done with the more complete PER model, which is forward-looking and recognizes both risk levels and growth projections.

The infinite dividend growth model can be used to develop the more complete PER model because they are both dependent on the key variables of growth,  $g$  (in dividends or earnings), and the required rate of return,  $k_E$ . The dividend growth model is:

$$P_0 = \frac{d_1}{k_E - g}$$

If both sides of the dividend growth model are divided by the expected earnings for the next year,  $E_1$ , then:

$$\frac{P_0}{E_1} = \frac{d_1/E_1}{k_E - g}$$

Note this is a *prospective* PER because it uses next year’s earnings  $E_1$ , rather than an historic PER, which uses  $E_0$ .

In this more complete model the appropriate multiple of earnings for a share rises as the growth rate,  $g$ , goes up; and falls as the required rate of return,  $k_E$ , increases. The relationship with the ratio  $d_1/E_1$  is more complicated. If this payout ratio is raised it will not necessarily increase the PER because of the impact on  $g$  – if more of the earnings are paid out less financial resource is being invested in projects within the business, and therefore future growth may decline.

### Worked example 13.4

#### RIDGE PLC

Ridge plc is anticipated to maintain a payout ratio of 48% of earnings. The appropriate discount rate for a share for this risk class is 14% and the expected growth rate in earnings and dividends is 6%.

$$\frac{P_0}{E_1} = \frac{d_1/E_1}{k_E - g}$$

$$\frac{P_0}{E_1} = \frac{0.48}{0.14 - 0.06} = 6$$

The spread between  $k_E$  and  $g$  is the main influence on an acceptable PER. A small change can have a large impact. Taking the case of Ridge, if we now assume a  $k_E$  of 12% and  $g$  of 8% the PER doubles.

$$\frac{P_0}{E_1} = \frac{0.48}{0.12 - 0.08} = 12$$

If  $k_E$  becomes 16% and  $g$  4% then the PER reduces to two-thirds its former value:

$$\frac{P_0}{E_1} = \frac{0.48}{0.16 - 0.04} = 4$$

### Worked example 13.5

#### WHIZZ PLC

You are interested in purchasing shares in Whizz plc. This company produces high-technology products and has shown strong earnings growth for a number of years. For the past five years earnings per share have grown, on average, by 10% per annum.

Despite this performance and analysts' assurances that this growth rate will continue for the foreseeable future you are put off by the exceptionally high prospective price earnings ratio (PER) of 25.

In the light of the more complete forward-looking PER method, should you buy the shares or place your money elsewhere?

Whizz has a beta of 1.8 which may be taken as the most appropriate systematic risk adjustment to the risk premium for the average share (see Chapter 10).

The risk premium for equities over government bonds has been 5% over the past few decades, and the current risk-free rate of return is 7%.

Whizz pays out 50% of its earnings as dividends.

*Answer*

*Stage 1 Calculate the appropriate cost of equity*

$$k_E = r_f + \beta(r_m - r_f)$$

$$k_E = 7 + 1.8(5) = 16\%$$

*Stage 2 Use the more complete PER model*

$$\frac{P_0}{E_1} = \frac{d_1/E_1}{k_E - g} = \frac{0.5}{0.16 - 0.10} = 8.33$$

The maximum multiple of next year’s earnings you would be willing to pay given the growth rate of dividends hereafter of 10% is 8.33. This is a third of the amount you are being asked to pay, therefore you will refuse to buy the share.

**Prospective PER varies with  $g$  and  $k_E$**

If an assumption is made concerning the payout ratio, then a table can be drawn up to show how PERs vary with  $k_E$  and  $g$ .

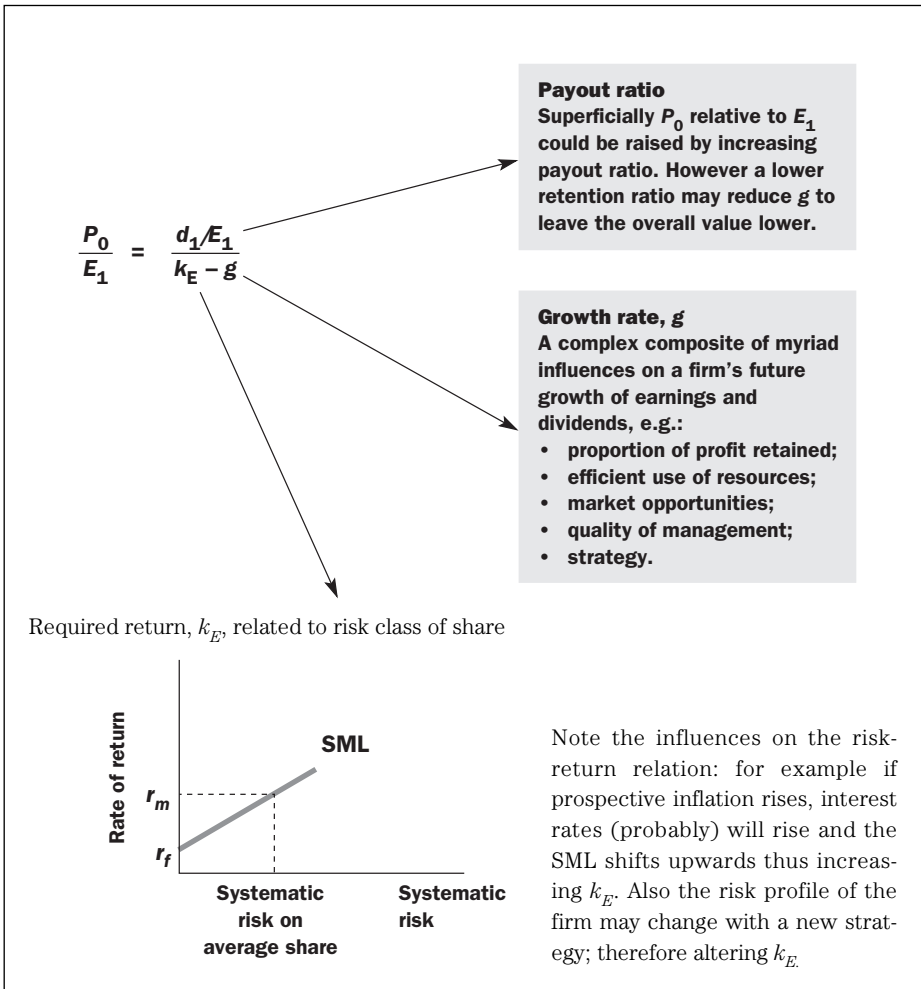
A payout ratio of 40–50 percent of after tax earnings is normal for UK shares, although in periods of profit declines companies tended to maintain dividends thus pushing up the proportion of earnings paid out to around 60 percent.

**FIGURE 13.3**  
**Prospective PERs for various risk classes and dividend growth rates**

		Assumed payout ratio = $\frac{d_1}{E_1} = 0.5$			
		Discount rate, $k_E$			
		8	9	10	12
Growth rate, $g$	0	6.3	5.6	5.0	4.2
	4	12.5	10.0	8.3	6.3
	5	16.7	12.5	10.0	7.1
	6	25.0	16.7	12.5	8.3
	8	–	50.0	25.0	12.5

**FIGURE 13.4**

The more complete PER model makes explicit key elements hidden in the crude PER model



The more complete model can help explain the apparently perverse behavior of stock markets. If there is ‘good’ economic news such as a rise in industrial output or a fall in unemployment the stock market often falls. The market likes the increase in earnings that such news implies, but this effect is often outweighed by the effects of the next stage. An economy growing at a fast pace is vulnerable to rises in inflation and the market will anticipate rises in interest rates to reflect this. Thus the  $r_f$  and the rest of the SML are pushed upward. The return required on shares,  $k_E$ , will rise, and this will have a depressing effect on share prices. The article reproduced in Exhibit 13.5 expresses this well.

## Why policymakers should take note

Philip Coggan

One issue which always mystifies the novice investor is why the financial markets always react so joyously to bad economic news. A rise in unemployment or a fall in industrial production seems to be worth a point on bonds and a jump in the stock market index.

Experienced global investors explain patiently that the key determinant of short term financial market performance is interest rates. Slower growth prompts monetary authorities to lower rates; this

in turn reduces corporate costs, reduces the appeal of holding cash, and in the case of falling long term yields, by lowering the rate at which future income streams are discounted, increases the present value of shares.

Conversely, of course, faster economic growth causes governments and central banks to fear higher inflation, prompting them to increase interest rates, with consequent adverse effects on share prices.

### EXHIBIT 13.5 Why policymakers should take note

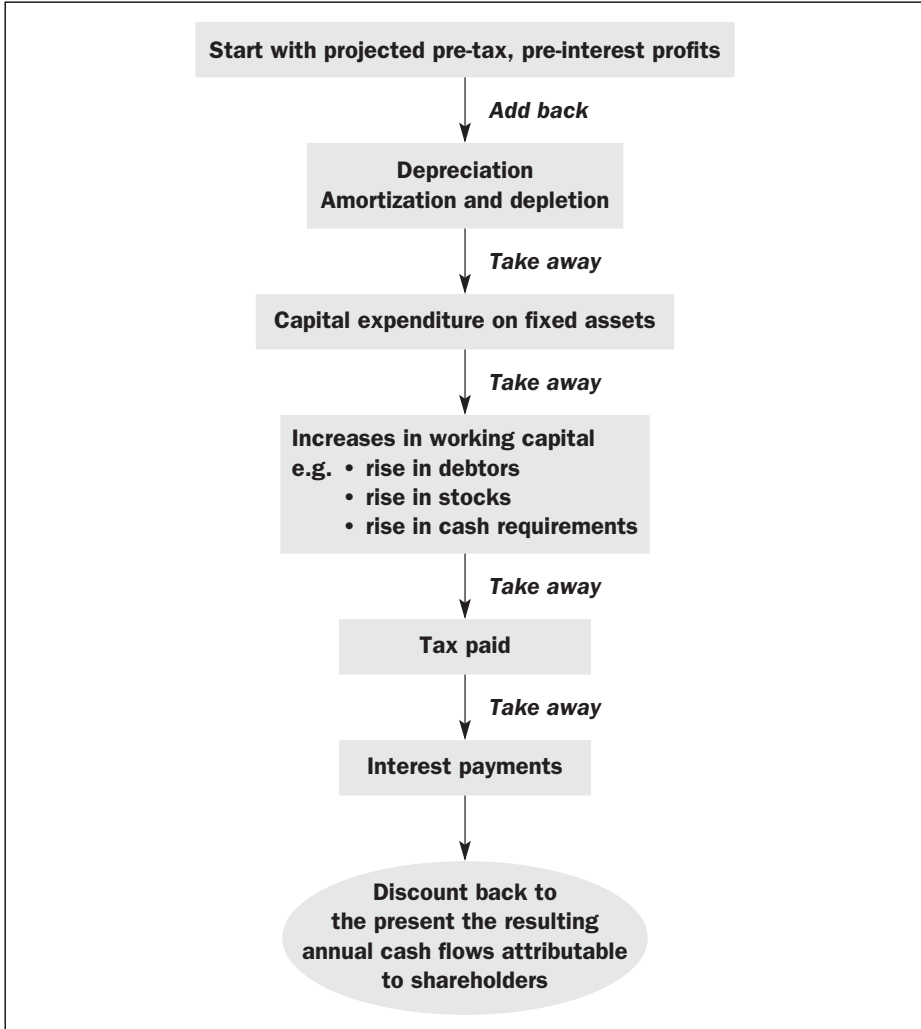
Source: *Financial Times*, 5 February 1996.

## Valuation using cash flow

The third and the most important valuation method is cash flow. In business it is often said that 'cash is king'. From the shareholders' perspective the cash flow relating to a share is crucial – they hand over cash and are interested in the ability of the business to return cash to them. John Allday, head of valuation at Ernst and Young, says that discounted cash flow 'is the purest way. I would prefer to adopt it if the information is there'.<sup>4</sup>

The interest in cash flow is promoted by the limited usefulness of published accounts. Skepticism about the accuracy of earnings figures, given the flexibility available in their construction, prompts a switch of attention to a purer valuation method than PER.

The cash flow approach involves the discounting of future cash flows. These cash flows are defined as the cash generated by the business after deduction of investment in fixed assets and working capital to fully maintain its long-term competitive position and its unit volume and to make investment in all new value-creating projects. To derive the cash flow attributable to shareholders, any interest paid in a particular period is deducted as well as taxation. The process of the derivation of cash flow from profit figures is shown in Figure 13.5.

**FIGURE 13.5****Cash flow calculation from projected profit figures**

An example of a cash flow calculation is shown in Table 13.4. The difference between profit and cash flows is particularly stark in the case of 2006 – the earnings number is much larger than the cash flow because of the large capital investment in fixed assets. Earnings are positive because only a small proportion of the cost of the new fixed assets is depreciated in that year.

Note also that there is a subtle assumption in this type of analysis. This is that all annual cash flows are paid out to shareholders rather than reinvested. If all positive NPV projects have been accepted using the money allocated to additional capital expenditures on fixed assets and working capital, then to withhold further money from shareholders would be value destructive because any other



**TABLE 13.4**  
**Cash flow-based share valuation**

£m	2005	2006	2007	2008	2009	Estimated average annual cash flow for period beyond planning horizon 2010–infinity
Forecast pre-tax, pre-interest profits	+11.0	+15.0	+15.0	+16.0	+17.0	
Add depreciation, amortization and depletion	+1.0	+2.5	+5.5	+4.5	+4.0	
Working capital increase (–) decrease (+)	+1.0	–0.5	0.0	+1.0	+1.0	
Tax (paid in year)	–3.3	–5.0	–5.0	–5.4	–5.8	
Interest on debt capital	–0.5	–0.5	–0.5	–0.6	–0.7	
Fixed capital investment	–1.0	–16.0	0.0	–1.2	–1.8	
Cash flow	+8.2	–4.5	+15.0	+14.3	+13.7	+14.0
Cash flow per share (assuming 100m shares)	8.2p	–4.5p	15p	14.3p	13.7p	14p
Discounted cash flow $k_E = 14\%$	$\frac{8.2}{1.14}$	$-\frac{4.5}{(1.14)^2}$	$+\frac{15}{(1.14)^3}$	$+\frac{14.3}{(1.14)^4}$	$+\frac{13.7}{(1.14)^5}$	$+\frac{14}{0.14} \times \frac{1}{(1.14)^5}$
Share value =	7.20	–3.5	+10.1	+8.5	+7.1	+51.9
						= 81.3p

projects would have negative NPVs. An alternative assumption, which amounts to the same effect in terms of share value, is that any cash flows that are retained and reinvested generate a return that merely equals the required rate of return for that risk class. If they produce merely the cost of capital no value is created. Of course, if the company knows of other positive value projects, either at the outset or comes across them in future years, it should take them up. This will alter the numbers in the table and so a new valuation is needed.

The definition of cash flow used here (which includes a deduction of expenditure on investment in fixed and working capital to maintain long-term competitive position, unit volume and make all new value creating projects) is significantly different to many accountant's and analyst's definitions of cash flow. They often neglect to allow for one or more of these factors. Be careful if you are presented with alternative cash flow numbers based on a different definition of cash flow.

## Valuation using owner-earnings

A simplified version of cash flow analysis is owner earnings.<sup>5</sup> For shares, intrinsic value is the discounted value of the owner earnings that can be taken out of a business during its remaining life. These correspond with standard cash flow analysis except that we calculate a sustainable level of owner earnings for a typical year (subject to a steady growth) rather than a unique cash flows for each of the future years.

Future owner earnings are determined by the strength and durability of the economic franchise (attractiveness of the industry plus competitive position of the firm in the industry), the quality of management and the financial strength of the business. In the following analysis we make use of Warren Buffett's definition of owner earnings, but with the additional factor in (c) and (d) of 'investment in all new value-creating projects'.

Owner earnings are defined as:

- reported earnings after tax and interest; *plus*
- depreciation, depletion (e.g. of oil reserves), amortization (of intangible assets, such as brand value) and certain other non-cash charges; *less*
- the amount of expenditures for plant and machinery, etc. that a business requires to fully maintain its long-term competitive position and its unit volume and to make investment in all new value-creating projects; *less*
- any extra amount for working capital that is needed to maintain the firm's long-term competitive position and unit volume and to make investment in all new value-creating projects.

Note that there are two types of investment. First, that which is needed to permit the firm to continue to maintain its existing competitive position at the current level of output. Second, investment in value-creating growth opportunities beyond the current position.

So, for example, Cotillo plc has reported earnings after tax for the most recent year of £16.3m. In drawing up the income (profit and loss) account deductions of £7.4m were made for depreciation, £152,000 for the amortization of intangible assets and £713,000 of goodwill was written off. It is estimated that an annual expenditure of £8.6m on plant, machinery, etc. will be required for the company to maintain its long-term competitive position and unit volume. For the sake of simplicity we will assume that no further monies will be needed for extra working capital to maintain long-term competitive position and unit volume. Also, Cotillo has no new value-creating projects.

The trading record of Cotillo plc has been remarkably stable in the past and is unlikely to alter in the future. It is reasonable to use the above figures for all future years. This would result in an estimated annual owner earnings of £15.965m (*see* Table 13.5).

TABLE 13.5

## Cotillo plc, owner earnings

		£000s
(a)	Reported earnings after tax and interest	16,300
	<i>Plus</i>	
(b)	Depreciation, depletion, amortization and other non-cash charges (7,400 + 152 + 713)	8,265
		24,565
	<i>Less</i>	
(c) and (d)	Expenditure on plant, equipment, working capital, etc. required to maintain long-term competitive position, unit volume and investment in new projects	8,600
		15,965

If we regard last year's owner earnings as the sustainable level for all future years then the discounted value of a perpetuity of £15.965m is £159.65m, if we take the discount rate to be 10 percent:

$$\text{Intrinsic value} = \frac{\pounds 15.965\text{m}}{0.10} = \pounds 159.65\text{m}$$

Intrinsic value is determined by the owner earnings that can be *taken out* of the business during its remaining life. Logically the management of Cotillo should pay out the full £15.956m each year to shareholders if the managers do not have investment projects within the firm that will generate returns of 10 percent or more because shareholders can get 10 percent return elsewhere for the same level of risk as holding a share in Cotillo. If the managers come across another project that promises a return of exactly 10 percent shareholder wealth will be unchanged whether the company invests in this or chooses to ignore the project and continues with the payment of all owner earnings each year. If the management discover, in a future year, a value-creating project that will produce, say, a 15 percent rate of return (for the same level of risk as the existing projects) then shareholders will welcome a reduction in dividends during the years of additional investment. The total value of discounted future owner earnings will rise and intrinsic value will be greater than £159.65m if such a project is undertaken.

Now let us assume that managers and shareholders are currently aware that Cotillo has a series of new value-creating (i.e. generating returns greater than 10 percent for the same risk) projects it can invest in. By investing in these projects owner earnings will rise by 5 percent year on year (on the one hand owner earnings are decreased by the need for additional investment under (c) and (d), but, on the other hand reported earnings are boosted under (a), to produce a net 5 percent growth). The intrinsic value becomes £335.26m viz:

Next year's owner earnings =  $£15.965m(1+g) = £15.965m(1+0.05) = £16.763m$

$$\text{Intrinsic value} = \text{next year's owner earnings}/(k_E - g) = \frac{16.763}{0.10 - 0.05} = £335.26m$$

EBITDA is classified by some commentators as a cash flow measure of value. There will be no promoting of EBITDA as a useful measure of valuation in this book, because it can lead to some very distorted thinking. EBITDA (pronounced e-bit-dah) became a very popular measure of a company's performance in the late 1990s. It was especially popular with managers of firms that failed to make a profit. EBITDA means earnings before interest, taxation, depreciation and amortization. Managers liked to emphasize this measure in their communications to shareholders because large positive numbers could be shown. Some cynics have it renamed it 'Earnings Before I Tricked the Dumb Auditor'.

**EBITDA can lead to some very distorted thinking.**

If you run an internet company that makes a £100m loss and the future looks pretty dim unless you can persuade investors and bankers to continue their support perhaps you would want to add back all the interest (say £50m), depreciation on assets that are wearing out or becoming obsolete (say £40m), and the declining value of intangible assets, such as software licenses and goodwill amortization of say £65m, so that you could show a healthy positive number on EBITDA of £55m. And if your loss seems to get worse from one year to the next as your acquisition strategy fails to pay off it is wonderfully convenient to report and emphasize a stable or rising EBITDA.

The use of EBITDA by company directors makes political spin-doctors look amateurs by comparison. EBITDA is not covered by any accounting standards so companies are entitled to use a variety of methods – whatever shows the company in the best light, I guess.

In the real world directors (and valuers) cannot ignore the cost of using up and wearing out equipment and other assets or the fact that interest and tax need to be paid however much they would want to. Warren Buffett made the comment: 'Reference to EBITDA makes us shudder – does management think the tooth fairy pays for capital expenditures?' (Berkshire Hathaway Inc., Letter Accompanying the 2000 report © Warren Buffett).

## Valuing unquoted shares

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The principles of valuation are the same for companies with a quoted share price on an exchange and for unquoted firms. The methods of valuation discussed above in relation to shares quoted on an exchange may be employed, but there may be some additional factors to consider in relation to unquoted firms' shares.

- *There may be a lower quality and quantity of information* The reporting statements tend to be less revealing for unquoted firms. There may also be a managerial reluctance to release information – or managers may release information selectively so as to influence value, for example, in merger discussions.

- *These shares may be subject to more risk* Firms at an early stage in their life cycle are often more susceptible to failure than are established firms.
- *The absence of a quotation usually means the shares are less liquid*, that is, there is a reduced ability to sell quickly without moving the price. This lack of marketability can be a severe drawback and often investors in unquoted firms, such as venture capitalists, insist on there being a plan to provide an exit route within say five years, perhaps, through a stock market float. But that still leaves a problem for the investor within the five years should a sale be required.
- *Cost of tying-in management* When a substantial stake is purchased in an unquoted firm, for the existing key managers to be encouraged to stay they may be offered financial incentives such as ‘golden hand-cuffs’ which may influence value. Or the previous owner-managers may agree an ‘earn-out’ clause in which they receive a return over the years following a sale of their shares (the returns paid to these individuals will be dependent on performance over a specified future period).

Unquoted firms’ shares tend to sell at significantly lower prices than those of quoted firms. Philip Marsden, deputy managing director of corporate finance at 3i, discounts the price by anything from one-third to a half<sup>6</sup> and the BDO Stoy Hayward/Acquisitions Monthly Private Company Price Index ([www.bdo.co.uk](http://www.bdo.co.uk)) shows unquoted firms being sold at an average PER of under two-thirds that for quoted shares.

## Unusual companies

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Obtaining information to achieve accuracy with discounted income flow methods is problematic for most shares. But in industries subject to rapid technological innovation it is extraordinarily difficult. While discounted income flow remains the ultimate method of valuation some analysts use more immediate proxies to estimate value. (A less scientific-sounding description is ‘rules of thumb’) For example, Gerry Stephens and Justin Funnell, media and telecoms analysts at NatWest Markets, describe the approach often adopted in their sector:<sup>7</sup>

Rather than DCF (discounted cash flow), people are often more comfortable valuing telemedia project companies using benchmarks that have evolved from actual market prices paid for similar assets, being based on a comparative measure or scale such as per line, per subscriber, per home or per pop (member of population). For example, an analyst might draw conclusions from the per-pop price that Vodaphone trades at to put a price on the float of Telecom Italia Mobile. The benchmark prices will actually have originated from DCF analysis and the price paid can give an element of objective validation to the implied subjective DCF.

This sort of logic has been employed in the valuation of internet companies. In their attempt to value future profits that were far from certain ‘analysts’ became more and more extreme in clutching at straws to value internet companies in the late 1990s – see Exhibit 13.6.

## The internet revolution

### *Lies, damned lies and web valuations*

**Internet fever gripped the world and led credulous investors to think dotcom companies were sure-fire winners. We show how scarce data, high hopes and fast-talking 'rock star' analysts fuelled a frenzy of speculation that eventually ended in tears**

The internet has turned out to be one of the most powerful forces shaping business for decades. But it has also proved to be fertile ground for speculation. Entirely new markets have been promised, with entirely new ways of doing business and new ways of making money.

With so much of this potential untested, financial analysts have developed new tools in order to be able to value businesses whose financial success will not be clear for years, if ever. Previously cautious professional forecasters have become accustomed to taking leaps in the dark to describe a future that seems almost limitless in its potential. And an army of boosters and spin doctors has been on hand to take up these predictions and trumpet them, aided by journalists and commentators, themselves struggling to keep up with the extraordinary changes that appeared to be under way ...

In a market where many internet companies had little in the way of revenues to show, let alone profits, their ability to attract the attention of the growing online audience became one of the only ways of measuring their performance.

Investors began to focus on the number of unique users (the number of different people who visited its site)

and page views (the number of web pages these visitors clicked on) claimed by a site.

Bob Davis, chief executive of Lycos, the US portal, defends the methods that have been developed for measuring internet audiences, while adding: 'It's working on being a science, but it isn't a science yet.' Of the audience numbers produced by such research, he adds: 'I wouldn't want to look at them on an absolute basis – but on a relative basis, they probably do a good job.' ... But companies did not always make it clear where they were using gross revenue, before subtracting cost of sales, and where they were referring to net revenue. Some omitted to point out how much of their advertising revenues derived from barter advertising with other websites, where money did not actually change hands. This backdrop of scarce data and high hopes provided an ideal environment for a number of quick-thinking, fast-talking analysts to make a name for themselves ...

Indeed, credibility was sometimes conferred by the amount of press attention the stocks had generated. Internet analysts joked about a 'price-to-press-cuttings ratio'.

### EXHIBIT 13.6 The internet revolution

Source: *Financial Times* 13 October 2000

Other sectors difficult to value directly on the basis of income flow include: advertising agencies, where a percentage of annual billings is often used as a proxy; mobile phone operators, where ARPU (average revenue per user) is used; fund managers, where value of funds under management is used; and hotels, where star ratings may be combined with number of rooms and other factors such as revenue per available room.

## Analysts grapple with Russian valuations

John Thornhill

### With few companies producing western-style accounts, alternative methodologies are called for

Markets have often experienced speculative frenzies, be it the explosion of tulip bulb prices in seventeenth century Holland or Florida real estate in the 1920s.

Observers of the Russian stock market may wonder if they are not watching a similar phenomenon.

'People may argue they are buying cheap assets, but at the end of the day it is earnings which drive prices. If you cannot see what those earnings are and the company is not adhering to shareholder rights, then you risk buying a pig in the poke,' Mr Mobius [president of Templeton Emerging Markets Fund] says. 'You are just creating conditions for people to gamble.'

To date, only a handful of Russia's 110,000 companies produce accounts that would survive the scrutiny of a diligent investor; almost none make dividend pay-outs on ordinary shares. That makes valuing Russian companies extremely difficult, heightening the dangers of speculative bubbles.

However, some analysts have invented alternative valuation methodologies to assess a company's worth. One of the earliest was to compare crude asset prices in Russia and abroad. So, for example, the implied value of a barrel of oil in the ground in Siberia would be compared with one in Texas by dividing an oil company's market value by its proven reserves.

Comparisons were made between an electricity generator's market value per kilowatt of output in Moscow and in Berlin, for instance.

The problem here is that a company's earnings are not always linked to output. Some prices are still subsidised, non-pay-

ments between companies are rife, and even big enterprises receive much of their income in bartered goods. Enterprises could be increasing output but bleeding cash.

Analysts therefore turned to market capitalisation-to-turnover valuations. But Russian companies use cash-based accounts rather than the accruals method used in the west. That means sales are only booked when a company receives the cash, making comparative sales figures look extremely erratic.

That prompted the most diligent analysts to reconstruct a company's accounts on an internationally-recognisable basis. Taking its annual output and guessing the market price of its goods, they made an attempt to forecast sales.

Unpicking stated tax accounts and adding back unrecognised factors such as depreciation charges, they then estimated earnings and cash flow.

But even for the most transparent companies, such estimates vary wildly. One investment bank has calculated Mosenergo, Moscow's electricity utility, stands on a price/earnings ratio of five; a rival bank suggests the true figure is 16. Many of these valuation techniques also contradict each other.

'On an asset basis Russian companies always look incredibly cheap. On a production basis they still look quite cheap. On a price to sales basis they begin to look like they might be priced about right. But on a p/e basis, taking account of corrected earnings, they all look blatheringly expensive,' Mr Nail [head of research at Deutsche Morgan Grenfell's Moscow office] says.

### EXHIBIT 13.7 Analysts grapple with Russian valuations

Source: *Financial Times* 31 January 1997

Valuing and buying shares in a well-regulated, stable environment with a flow of factual information is one thing. As the article reproduced in Exhibit 13.7 shows, buying in some emerging markets is another – innovative valuation techniques may be called for.

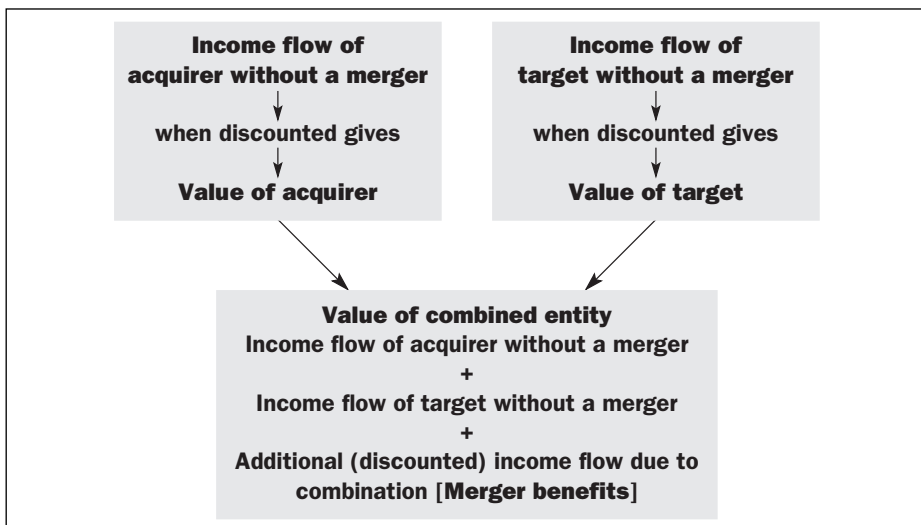
## Managerial control changes the valuation

The value of a share can change depending on whether the purchaser gains a controlling interest in the firm. The purchase of a single share brings a stream of future dividends without any real influence over the level of those dividends. However, control of a firm by, say, purchasing 50 percent or more of the shares, permits the possibility of changing the future operations of the firm, thus enhancing returns. A merger may allow economies of scale and other synergies, or future earnings may be boosted by the application of superior management skills.

The difference in value between a share without management control and one with it helps to explain why we often witness a share price rise of 30–50 percent in a takeover bid battle. There are two appraisals of the value of the firm, both of which may be valid depending on the assumption concerning managerial control. Figure 13.6 shows that extra value can be created by merging the operations of two firms.

Figure 13.6 is not meant to imply that the acquiring firm will pay a bid premium equal to the estimated merger benefits. The price paid is subject to negotiation and bargaining. The acquirer is likely to try to offer significantly less than the combined amount of the target firm's value 'as is' and the merger benefits. This will enable it to retain as much as possible of the increased value for itself rather than pass value on to the target shareholders. (See Chapter 12 for more detail.)

**FIGURE 13.6**  
Value creation through merger





The merger of Glaxo Wellcome and SmithKline Beecham will provide a framework for illustrating possible use of the income flow model when managerial control is obtained. In 2000 the two companies claimed that by merging they could save £1,300m annually by combining projects, R&D synergies and by cost-cutting in manufacturing and supply operations.

In the absence of a takeover the value of a share in either company is:

$$P_0 = \frac{d_1}{k_E - g}$$

This is where  $d_1$  and  $g$  are generated by the existing structure and strategy.

Alternatively, we could examine the entire cash flow of the company (available to be paid out to shareholders after maintaining the firm's competitive position, unit volume and investing in all value generating projects) rather than that relating to a single share.

$$V = \frac{C_1}{k_E - g_c}$$

where:

$V$  = value of the entire firm;

$C_1$  = total cash flows at time 1 expected to continue growing at a constant rate of  $g_c$  in future years.

If there is a new strategy the values in the equations change:

$$P_0 = \frac{d_1^*}{k_E - g^*}$$

or, for the entire cash flow:

$$V = \frac{C_1^*}{k_E - g_c^*}$$

$d_1^*$ ,  $C_1^*$ ,  $g^*$ ,  $g_c^*$  allow for the following:

synergy;

cutting out costs;

tax benefits;

superior management;

other benefits (for example, lower finance costs, greater public profile, market power) less any additional costs.

Alternatively, a marginal approach could be adopted in which  $C_1^*$ ,  $d_1^*$ ,  $g^*$  and  $g_c^*$  are redefined as the *additional* cash flows and growth in cash flows due to changes in ownership. For example, let us assume that the annual earnings gain of £1,300m is obtained in Year 1 but does not increase thereafter. Therefore  $g = 0$ . Let us further assume that the required rate of return on an investment of this risk class is 10 percent. Thus the present value of the efficiency gains is:

$$V = \frac{C_1^*}{k_E - g_c^*} = \frac{\pounds 1,300\text{m}}{0.10 - 0} = \pounds 13,000\text{m}$$

We could change the assumption to gain insight into the sensitivity of the added value figure. For example, if it is anticipated that the benefits will rise each year by 2 percent (so they are  $\pounds 1,326\text{m}$  in Year 2 and  $\pounds 1,352.5\text{m}$  in Year 3, etc.) then the maximum bid premium will rise:

$$V = \frac{C_1^*}{k_E - g_c^*} = \frac{\pounds 1,300\text{m}}{0.10 - 0.02} = \pounds 16,250\text{m}$$

On the other hand, the management of the two companies might have been carried away with the excitement of the bid battle and the  $\pounds 1,300\text{m}$  quoted might have come from hype or hubris, and, in fact, the difficulties of integration produce negative incremental cash flows.

In the three years following the merger GlaxoSmithKline managers were very pleased with themselves: they regularly announced that cost synergies have been revised upwards from their initial estimates.

### Worked example 13.6

#### THINGAMEES

Big plc has made it clear to the widget industry that it is willing to sell its subsidiary, Little plc, a manufacturer of thingamees. You are a member of the strategy management team at Thingamees International plc, the largest producers of thingamees in the UK. Your firm is interested in acquiring Little and as a first step has obtained some information from Big plc.

#### Little plc balance sheet

	£m
Fixed assets	10
Current assets	
Cash	0.5
Stock	1.5
Debtors	<u>3.0</u>
	5
Current liabilities	(6)
Bank loan	<u>(4)</u>
Net assets	<u>5</u>

**Trading record**

Year	Earnings, £m (Owner earnings)
2003	1.86
2002	1.70
2001	1.65
2000	1.59
1999	1.20
1998	1.14
1997	1.01

**Additional information**

By combining the logistical departments you estimate that transport costs could be lowered by £100,000 per annum, and two secretarial posts eliminated, saving £28,000 p.a.

The closure of Little's head office would save £400,000 p.a. in staffing and running costs, but would also mean an additional £250,000 p.a. of administration costs at Thingamees plc to undertake some crucial tasks. The office building is situated in a good location and would raise a net £5m if sold immediately. A potential liability not displayed in Little's balance sheet is a possible legal claim of £3m relating to an earlier disposal of an asset. The plaintiff and Little's board have not yet reached agreement (Little's board is adamant that there is no liability).

Your appraisal of Little's management team is that it is a mixed bunch – some good, some very bad. Profits could be raised by £500,000 per year if you could impose your will quickly and remove poor managers. However, if you have to take a more gradual 'easing out' approach, operating profits will rise by only £300,000 per year.

The problems connected with a quick transition are: a sacking left, right and center may cause disaffection among the good managers, encouraging hostility, departures and (a) profits collapse, and (b) Big plc is keen that you provide a commitment to avoid large-scale redundancies.

Big, Little and Thingamees International all have a beta of 1.5, which is representative of the appropriate adjustment to the risk premium on the average share given the systematic risk. The risk-free rate of return is 8% and the historical risk premium of share portfolios over safe securities has been 5%.

The increased market power available to Thingamees International after purchasing Little would improve margins in Thingamees International's existing business to provide an additional £100,000 per annum. Assume that tax is irrelevant.

**Required**

- Calculate the value of Little plc in its present form, assuming a continuation of its historic growth rate.
- Calculate the value of Little plc if you were unable to push for maximum management redundancies and Little continued with its historical growth rate for its owner earnings (that is, the earnings before merger benefits). Assume that the annual merger benefits are constant for all future years to an infinite horizon, that is, there is no growth.
- Calculate the value of Little plc on the assumption that you are able to push through the rapid management changes and the pre-acquisition earnings continue on their historic growth path. (Again, the annual merger savings are fixed.)
- Discuss the steps you would take to get around the obstacles to shareholder wealth maximization.

**Answers**

- First calculate the required rate of return:

$$\begin{aligned} k_E &= r_f + \beta (r_m - r_f) \\ &= 8 + 1.5 (5) = 15.5\% \end{aligned}$$

(The required rate of return is discussed in Chapter 10.)

- Then calculate growth rate of cash flows:

$$g = \sqrt[6]{\frac{1.86}{1.01}} - 1 = 10.71\%$$

- Then calculate the value of Little plc:

$$V = \frac{C_1}{k_E - g} = \frac{1.86(1 + 0.1071)}{0.155 - 0.1071} = \text{£}42.990\text{m}$$

The value of Little to its shareholders under its present strategy and managers is £42.990m.

- Calculate the present value of the future cash flows. These come in three forms.
  - Those cash flows available immediately from selling assets, etc., less the amount due on a legal claim (taking the most conservative view):

Time 0 cash flows

Sale of head office	£5m
Less legal claim	<u>£3m</u>
	<u>£2m</u>

– Merger benefit cash flow – constant for all future years:

	£m
Transport	0.100
Secretaries	0.028
Head office	0.150
Managerial efficiency	0.300
Market power	<u>0.100</u>
Boost to cash flow	<u>0.678</u>

This is a perpetuity which has a present value of:

$$\frac{0.678}{0.155} = \text{£}4.374\text{m}$$

– The present value of Little under its existing strategy, £42.990m.

Add these values together:

	£2.000m
	£4.374m
	<u>£42.990m</u>
Total value if unable to sack poor managers	<u><b>£49.364m</b></u>
■ Value of business in existing form	£42.990m
plus value of annual savings and benefits	
	$\frac{678,000 + 200,000}{0.155}$
	£5.665m
plus Time 0 cash flows	<u>£2.000m</u>
Total value if able to sack poor managers	<u><b>£50.655m</b></u>

Thingamees International now has a bargaining range for the purchase of Little. Below £42.99m the existing shareholders will be reluctant to sell. Above £50.665m, Thingamees may destroy value for its own shareholders even if all poor managers can be removed.

- Some ideas: One possible step to reduce risk is to insist that Big plc accepts all liability relating to the legal claim. Another issue to be addressed in the negotiation phase is to avoid being hamstrung by redundancy commitments. Also plan the process of merger integration. In the period before the merger explain your intentions to Little's employees. After the transfer do not alienate the managers and other employees by being capricious and secretive – be straight and honest. If pain is to be inflicted for the good of the firm, be quick, rational and fair, communicate and explain.

## Conclusion

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There are two points about valuation worth noting. First going through a rigorous process of valuation is more important than arriving at *an* answer. It is the understanding of the assumptions and an appreciation of the nature of the inputs to the process that give insight, not a single number at the end. It is the recognition of the qualitative, and even subjective, nature of key variables in an apparently quantitative analysis that leads to knowledge about values. We cannot escape the uncertainty inherent in the valuation of a share – what someone is willing to pay depends on what will happen in the future – and yet this is no excuse for rejecting the models as unrealistic and impractical. They are better than the alternatives: guessing, or merely comparing one share with another with no theoretical base to anchor either valuation. At least the models presented in this chapter have the virtue of forcing the analyst to make explicit the fundamental considerations concerning the value of a share.

**Going through a rigorous process of valuation is more important than arriving at *an* answer.**

The second point leads on from the first. It makes sense to treat the various valuation methods as complementary rather than as rivals. Obtain a range of values in full knowledge of the weaknesses of each approach and apply informed judgment to provide an idea of the value region.

## Notes

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- 1 See discussion in Chapter 14 based on evidence from Lintner (1956) and 3i (1993) – details of these sources are in Chapter 14 References and Further Reading.
- 2 If the dividends continue to grow at the rate  $g$  in perpetuity.
- 3 Warren Buffett seminar held at Columbia University Business School. ‘Investing in equity markets’, 13 March 1985, Transcript, p. 23. Reproduced in Janet Lowe (1997).
- 4 Quoted by Robert Outram (1997), p. 70.
- 5 Warren Buffett developed this method. A modified version is shown here which incorporates the investment in value generating projects rather than a steady state owner earnings (see Arnold 2002 *Valuegrowth Investing* for more details).
- 6 Source: Robert Outram (1997), p. 71.
- 7 Stephens and Funnell (1995), p. 20.



## WHAT PAY-OUTS SHOULD WE MAKE TO SHAREHOLDERS?

Introduction

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Defining the problem

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Theorists in their hypothetical world

---

The other extreme – dividends as a residual

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What about the world in which we live?

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Some muddying factors

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Scrip dividends

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Share buy-backs and special dividends

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A round-up of the arguments

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Conclusion

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‘Dividend policy is often reported to shareholders, but seldom explained. A company will say something like, “Our goal is to pay out 40% to 50% of earnings and to increase dividends at a rate at least equal to the rise in the CPI.”<sup>1</sup> And that’s it – no analysis will be supplied as to why that particular policy is best for the owners of the business. Yet, allocation of capital is crucial to businesses and investment management. Because it is, we believe managers and owners should think hard about the circumstances under which earnings should be retained and under which they should be distributed.’

**Managers and owners should think hard about the circumstances under which earnings should be retained and under which they should be distributed.**

Source: Warren Buffett, a letter to shareholders attached to the *Annual Report of Berkshire Hathaway Inc* (1984). © Warren Buffett.

## Introduction

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After 50 years of observing managers Warren Buffett’s comments may be viewed as a sad indictment of the quality of managerial thought on the issue of dividend policy. On the central issue of whether to retain profits, or distribute them to shareholders to use elsewhere, there appears to be vagueness and confusion. He has suggested that the issue is addressed at a superficial level with the employment of simple rules of thumb and no analysis. This conclusion may or may not be unfair – this chapter is not designed to highlight managerial failings in the depth of thought department. What it can do, however, is point out the major influences on the level of the dividend decision in any one year. Some of these are fully ‘rational’ in the sense of the economist’s model, others are less quantifiable, and stem more from the field of psychology.

The conclusion reached is that managers have to weigh up a range of forces – some pulling them in the direction of paying out either a high proportion of earnings or a low one; other forces pulling them to provide a stable and consistent dividend, and yet others pulling them to vary the dividend from year to year.

These are, of course, merely the range of forces influencing managers who are fully committed to shareholder wealth maximization and thinking ‘hard about the circumstances under which earnings should be retained’. If we admit the possibility that managers have other goals, or that they make little intellectual effort, the possible outcomes of the annual or semi-annual boardroom discussion on the dividend level can range widely.

## Defining the problem

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Dividend policy is the determination of the proportion of profits paid out to shareholders – usually periodically. The issue to be addressed is whether shareholder wealth can be enhanced by altering the *pattern* of dividends not the size of dividends overall. Naturally, if dividends over the lifetime of a firm are larger, value will be greater. So in the forthcoming analysis we will assume that:

- the underlying investment opportunities and returns on business investment are constant; and
- the extra value that may be created by changing the capital structure (debt–equity ratio) is constant.

Therefore only the pattern of dividend payments may add or subtract value. For example, perhaps a pattern of high pay-outs in the immediate future, with a consequential reduction in dividend growth thereafter, may be superior to a policy of zero or small dividends now followed by more rapid growth over time.

Another aspect of the pattern question is whether a steady, stable dividend growth rate is better than a volatile one which varies from year to year depending on the firm's internal need for funds.

### Some background

UK-quoted companies usually pay dividends every six months. In each financial year there is an *interim* dividend related to the first half year's trading, followed by the final dividend after the financial year-end. The board of directors are empowered to recommend the *final* dividend level but it is a right of shareholders as a body to vote at the annual general meeting whether or not it should be paid. Not all companies follow the typical cycle of two dividends per year: a few pay dividends quarterly and others choose not to pay a dividend at all.

Dividends may only be paid out of accumulated profits and not out of capital. This means that companies which have loss-making years may still pay dividends, but only up to the point that they have retained profits from previous years. This rule is designed to provide some protection to creditors by putting a barrier in the way of shareholders looking to remove funds from the firm, and thereby withdrawing the cushion of capital originally provided by shareholders. Further restrictions may be placed on the firm's freedom of action with regard to dividend levels by constraints contained in bond, preference share and bank-loan agreements.

### Theorists in their hypothetical world

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According to an important 1961 paper by Miller and Modigliani (MM), if a few assumptions can be made, dividend policy is irrelevant to share value. The determinant of value is the availability of projects with positive NPVs and the pattern of dividends makes no difference to the acceptance of these. The share price would not move if the firm declared either a zero dividend policy or a policy of high near-term dividends. The conditions under which this was held to be true included:

- There are no taxes.
- There are no transaction costs, for example:
  - investors face no brokerage costs when buying or selling shares,
  - companies can issue shares with no transaction costs.

- All investors can borrow and lend at the same interest rate.
- All investors have free access to all relevant information.

Given these assumptions, dividend policy can become irrelevant. For example, a firm which had plentiful positive NPV projects but nevertheless paid all profits each year as dividends would not necessarily be destroying shareholder wealth because in this ideal world any money paid out could quickly be replaced by having a new issue of shares.<sup>2</sup> The investors in these shares would willingly pay a fair price because of their access to all relevant information. The shares can be issued by the firm without costs of underwriting or merchant banks' fees, etc., and bought by the shareholders without brokers' fees or costs associated with the time spent filling in forms, etc. That is, there are no transaction costs.

If a company chose not to pay any dividends at all and shareholders required a regular income then this could be achieved while leaving the firm's value intact. 'Homemade dividends' can be created by shareholders selling a portion of their shares to other investors – again, as there are no costs of transactions and no taxation the effect is identical to the receipt of cash in the form of an ordinary dividend from the firm.

Take the example of Belvoir plc, an all-equity company which has a policy of paying out all profit as dividend. The company is expected to generate a profit of £1m to an infinite horizon. Given the cost of equity capital is 12 percent we can calculate the value of this firm using the dividend valuation model (with zero growth – see Chapter 13 for details).

$$P_0 = d_0 + \frac{d_1}{k_E} = \text{£}1\text{m} + \frac{\text{£}1\text{m}}{0.12} = \text{£}9.333\text{m}$$

This includes £1m of dividend due to be paid immediately, plus the £1m perpetuity.

Now suppose that the management have identified a new investment opportunity. This will produce additional cash flows of £180,000 per year starting in one year. However the company will be required to invest £1m now. There are two ways in which this money for investment could be found. First, the managers could skip the present dividend and retain £1m. Second, the company could maintain its dividend policy for this year and pay out £1m, but simultaneously launch a new issue of shares, say a rights issue, to gain the necessary £1m.

It will now be demonstrated that in this perfect world, with no transaction costs, shareholder value will be the same whichever dividend policy is adopted. What *will* increase shareholder value is the NPV of the project.

$$\text{NPV} = -\text{£}1\text{m} + \frac{\text{£}180,000}{0.12} = \text{£}500,000$$

The value of the firm is raised by £500,000, by the acceptance of the project and not because of the dividend policy. If the project is financed through the sacrifice of the present dividend the effect on shareholder wealth is:

Year	0	1	2	3 etc.
Cash flow to shareholders	0	1,180,000	1,180,000	1,180,000

$$\text{Shareholders' wealth} = \frac{1,180,000}{0.12} = \text{£9.833m}$$

Shareholders' wealth is increased by £500,000.

If the project is financed through a rights issue (selling more shares to existing shareholders – see Chapter 17) while leaving the dividend pattern intact the effect on shareholder wealth is the same – an increase of £500,000.

Year	0	1	2	3
Cash flow to shareholders:				
Receipt of dividend	+£1,000,000			
Rights issue	<u>-£1,000,000</u>			
	0	1,180,000	1,180,000	1,180,000

$$\text{Shareholders' wealth} = \frac{1,180,000}{0.12} = \text{£9.833m}$$

Shareholders' wealth is enhanced because £1m of shareholders' money is invested in a project which yields more than 12 percent. If the incremental cash inflows amounted to only £100,000 then the wealth of shareholders would fall, because a 10 percent return is insufficient given the opportunity cost of shareholders' money:

$$\frac{\text{£1,100,000}}{0.12} = \text{£9.167m}$$

If the new investment produces a 12 percent return shareholders will experience no loss or gain in wealth. The critical point is that in this hypothetical, perfect world the pattern of dividend makes no difference to shareholders' wealth. This is determined purely by the investment returns. If a firm chose to miss a dividend for a year, because it had numerous high-yielding projects to invest in, this would not decrease share values, because the perfectly well-informed investors are aware that any cash retained will be going into positive NPV projects which will generate future dividend increases for shareholders.

## The other extreme – dividends as a residual

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Now we take another extreme position. Imagine that the raising of external finance (for example rights issues) is so expensive that to all intents and purposes it is impossible. The only source of finance for additional investment is earnings. Returning to the example of Belvoir, it is obvious that under these circumstances, to pay this year's dividend will reduce potential shareholder value by £500,000 because the new project will have to be abandoned.

In this world dividends should only be paid when the firm has financed all its positive NPV projects. Once the firm has provided funds for all the projects which more than cover the minimum required return, investors should be given the residual. They should receive this cash because they can use it to invest in other firms of the same risk class, which provide an expected return at least as great as the required return on equity capital,  $k_E$ . If the firm kept all the cash flows and continued adding to its range of projects the marginal returns would be likely to decrease, because the project with the highest return would be undertaken first, followed by the one with the next highest return, and so on, until returns became very low.

In these circumstances dividend policy becomes an important determinant of shareholder wealth:

- 1 If cash flow is retained and invested within the firm at less than  $k_E$ , shareholder wealth is destroyed; therefore it is better to raise the dividend payout rate.
- 2 If retained earnings are insufficient to fund all positive NPV projects shareholder value is lost, and it would be beneficial to lower the dividend.

## What about the world in which we live?

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We have discussed two extreme positions so far and have reached opposing conclusions. In a perfect world the dividend pattern is irrelevant because the firm can always fund itself costlessly if it has positive NPV projects, and shareholders can costlessly generate 'homemade dividends' by selling some of their shares. In a world with no external finance the pattern of dividends becomes crucial to shareholder wealth, as an excessive pay-out reduces the take-up of positive NPV projects; and an unduly low pay-out means value destruction because investors miss out on investment opportunities elsewhere in the financial securities market.

In our world there are transaction costs to contend with. If a firm pays a dividend to keep to its avowed dividend pattern and then, in order to fund projects, takes money from shareholders through a rights issue, this is not frictionless: there are costs. The expense for the firm includes the legal and administrative cost of organizing a rights issue or some other issue of shares; it may be necessary to prepare a prospectus and to incur advertising costs; underwriting fees alone can be as much as 2 percent of the amount raised. The expense for the

shareholder of receiving money with one hand only to give it back with the other might include brokerage costs and the time and hassle involved. Taxes further complicate the issue by imposing additional costs.

It is plain that there is a powerful reason why dividend policy might make some difference to shareholder wealth: the investment opportunities within the firm obviously have some effect. This may help to explain why we witness many young rapidly growing firms with a need for investment finance having a very low dividend (or zero) pay-outs, whereas mature ‘cash cow’ type firms choose a high payout rate.

The relationship between investment opportunity and dividend policy is a far from perfect one and there are a number of other forces pulling on management to select a particular policy. These will be considered after some more down-to-earth arguments from Warren Buffett (*see* Exhibit 14.1).

Arc is a company that has been criticized for holding on to cash that it cannot use for value creating investments (see Exhibit 14.2).

## Berkshire Hathaway Inc

‘Earnings should be retained only when there is a reasonable prospect – backed preferably by historical evidence or, when appropriate by a thoughtful analysis of the future – *that for every dollar retained by the corporation, at least one dollar of market value will be created for owners* [italics in original]. This will happen only if the capital retained produces incremental earnings equal to, or above, those generally available to investors.’

Warren Buffett says that many managers think like owners when it comes to demanding high returns from subordinates but fail to apply the same principles to the dividend payout decision:

‘The CEO of multi-divisional company will instruct Subsidiary A, whose earnings on incremental capital may be expected to average 5%, to distribute all available earnings in order that they may be invested in Subsidiary B, whose

earnings on incremental capital are expected to be 15%. The CEO’s business school oath will allow no lesser behavior. But if his own long-term record with incremental capital is 5% – and market rates are 10% – he is likely to impose a dividend policy on shareholders of the parent company that merely follows some historic or industry-wide payout pattern. Furthermore, he will expect managers of subsidiaries to give him a full account as to why it makes sense for earnings to be retained in their operations rather than distributed to the parent-owner. But seldom will he supply his owners with a similar analysis pertaining to the whole company ... shareholders would be far better off if earnings were retained only to expand the high-return business, with the balance paid in dividends or used to repurchase stock [shares].’

### EXHIBIT 14.1 Buffett on dividends

Source: Letter to shareholders, *Annual Report of Berkshire Hathaway Inc* (1984). Reproduced by kind permission of Warren Buffett. © Warren Buffett.

## Arc agrees to hand back £50m

Astrid Wendlandt

Arc International has agreed to hand back £50m excess cash after arm-twisting by some of its largest shareholders.

The lossmaking chip designer yesterday announced plans to return to investors 17p a share in the first half of next year.

The move came after at least one institutional shareholder threatened to call an extraordinary meeting to remove management if their cash demands for a return of the cash were not heeded.

Mike Gullett, Arc chief executive said: 'We decided that we had more cash than we needed and decided to give some of it back to increase shareholder value.'

However, some shareholders had been hoping to see Arc, which has

£100m of cash, return at least £75m, or 25p a share. Yesterday, the shares closed up  $\frac{3}{4}$ p at 21p.

One of the company's largest shareholders said: 'It's been a battle to get 17p but they have not gone far enough. The board does not understand that shareholders would rather have the cash in their hands than sitting on the company's balance sheet.'

WestLB Panmure, appointed to conduct a review of the company's finances this autumn, estimating Arc needed only about £15m of cash to take it through to profitability, which it expects to reach by the end of 2003.

### EXHIBIT 14.2 Arc agrees to hand back £50m

Source: *Financial Times* 23/24 November 2002

## Some muddying factors

### Clientele effects

Some shareholders prefer a dividend pattern that matches their desired consumption pattern. There may be natural clienteles for shares which pay out a high proportion of earnings, and another clientele for shares which have a low payout rate. For example, retired people, living off their private investments, may prefer a high and steady income, so they would tend to be attracted to firms with a high and stable dividend yield. Likewise, some pension funds need regular cash receipts to meet payments to pensioners.

Shareholders who need a steady flow of income, could, of course, generate a cash flow stream by selling off a proportion of their shares on a regular basis as

**It is time-consuming and inconvenient to regularly sell off blocks of shares; it is much easier to receive a series of dividend checks through the post.**

an alternative to investing in firms with a high payout ratio. But this approach will result in transaction costs (brokerage, marketmakers' spread and loss of interest while waiting for cash after sale). Also it is time-consuming and inconvenient to regularly sell off blocks of shares; it is much easier to receive a series of dividend checks through the post.

Another type of clientele are people who are not interested in receiving high dividends in the near term. These people prefer to invest in companies with good growth potential – companies which pay low dividends and use the retained money to invest in projects with positive NPVs within the firm. The idea behind such practices is that capital gains (a rising share price) will be the main way in which the shareholder receives a return. An example of such a clientele group might be wealthy middle-aged people who have more than enough income from their paid employment for their consumption needs. If these people did receive large amounts of cash in dividends now they would probably only reinvest it in the stock market. A cycle of receiving dividends followed by reinvestment is very inefficient.

It seems reasonable to argue that a proportion of shareholders choose to purchase particular shares at least partially because the dividend policy suits them. This may place pressure on the management to produce a stable and consistent dividend policy because investors need to know that a particular investment is going to continue to suit their preferences. Inconsistency would result in a lack of popularity with any client group and would depress the share price. Management therefore, to some extent, target particular clienteles.<sup>3</sup>

The clientele force acting on dividend policy at first glance seems to be the opposite of the residual approach. With the clientele argument, stability and consistency are required to attract a particular type of clientele, whereas with the residual argument, dividends depend on the opportunities for reinvestment – the volume of which may vary in a random fashion from year to year, resulting in fluctuating retentions and dividends. Most firms seem to square this circle by having a consistent dividend policy based on a medium- or long-term view of earnings and investment capital needs. The shortfalls and surpluses in particular years are adjusted through other sources of finance: for example, borrowing or raising equity through a rights issue in years when retained earnings are insufficient; paying off debt or storing up cash when retentions are greater than investment needs. There are costs associated with such a policy, for example the costs of rights issues, and these have to be weighed against the benefit of stability.

The clientele effect is often reinforced by the next factor we will examine, taxation. The consistent dividend pattern policy is encouraged by the information aspect of dividends – discussed after that.

## Taxation

The taxation of dividends and capital gains on shares is likely to influence the preference of shareholders for receiving cash either in the form of a regular payment from the company (a dividend) or by selling shares. If shareholders are taxed more heavily on dividends than on capital gains they are more likely to favor shares which pay lower dividends. In the past, UK and US dividends were taxed at a higher rate than that which applied to the capital gains made on the sale of shares for those shareholders subject to these taxes. However, in recent years, the difference has



been narrowed significantly. In the UK, for example, capital gains are now taxed at the individual's marginal tax rate. Capital gains still, however, have tax advantages. Investors are allowed to make annual capital gains of £8,200 (in 2004–5) tax free. Furthermore, they only pay tax on realized gains (when the shares are sold). This allows them to delay payment by continuing to hold the shares until they can, say, take advantage of a future year's capital allowance of £8,200. In addition, if shares are held for a few years the tax rate payable falls significantly.

Elton and Gruber (1970) found evidence that there was a statistical relationship between the dividend policy of firms and the tax bracket of their shareholders – shareholders with higher income tax rates were associated with low-dividend shares and those with lower income tax rates with high-dividend shares.

Gordon Brown, the Chancellor, changed the tax system explicitly to encourage lower dividends and greater investment within firms. He said:

The present system of tax credits encourages companies to pay out dividends rather than reinvest their profits. This cannot be the best way of encouraging investment for the long term as was acknowledged by the last government. Many pension funds are in substantial surplus and at present many companies are enjoying pension holidays, so this is the right time to undertake long-needed reform. So, with immediate effect, I propose to abolish tax credits paid to pension funds and companies.<sup>4</sup>

## Information conveyance

Dividends appear to act as important conveyors of information about companies. An unexpected change in the dividend is regarded as a sign of how the directors

**Dividends appear to act as important conveyors of information about companies.**

view the future prospects of the firm. An unusually large increase in the dividend is often taken to indicate an optimistic view about future profitability. A declining dividend often signals that the directors view the future with some pessimism.

The importance of the dividend as an information-transferring device occurs because of a significant market imperfection – information asymmetry. That is, managers know far more about the firm's prospects than do the finance providers. Investors are continually trying to piece together scraps of information about a firm. Dividends are one source that the investor can draw upon. They are used as an indicator of a firm's sustainable level of income. It would seem that managers choose a target dividend payout ratio based on a long-term earnings trend.<sup>5</sup> It is risky for managers' career prospects for them to increase the dividend above the regular growth pattern if they are not expecting improved business prospects. This sends a false signal and eventually they will be found out when the income growth does not take place.

It is the increase or decrease over the *expected* level of dividends that leads to a rise or fall in share price. This phenomenon can be illustrated from the article on Hanson reproduced in Exhibit 14.3. Here, Hanson reported falling profits and yet the share price rose because the management signaled its optimism by raising the dividend.

## Higher pay-out welcomed at Hanson

Lucy Smy

Shares in Hanson, the aggregates group, rose more than 6 per cent yesterday as investors chose to ignore falling full-year profits, focusing instead on a 10 per cent increase in the dividend.

Jonathan Nicholls, finance director, said: 'It is visible statement of our confidence. We have listened to our shareholders who say we have the cash-flow there to support it.'

### EXHIBIT 14.3 Higher pay-out welcomed at Hanson

Source: *Financial Times* 21 February 2003

Generally company earnings fluctuate to a far greater extent than dividends. This smoothing of the dividend flow is illustrated in Table 14.1 where Cadbury Schweppes has shown a rise and a fall in earnings per share but has a steadily rising dividend.

**TABLE 14.1**

**Cadbury Schweppes earnings and dividend, eleven-year record (pence per share)**

Year	Earnings	Dividends
1993	14.7	6.9
1994	16.1	7.5
1995	16.2	8.0
1996	16.9	8.5
1997	34.0	9.0
1998	17.1	9.5
1999	32.0	10.0
2000	24.8	10.5
2001	27.0	11.0
2002	27.4	11.5
2003	18.2	12.0

Source: Cadbury Schweppes Report and Accounts 2002 and 2003

A reduction in earnings is usually not followed by a reduction in dividends, unless the earnings fall is perceived as likely to persist for a long time. Ever since Lintner's (1956) survey on managers' attitudes to dividend policy in the 1950s, researchers have shown that directors are aware that the market reacts badly to dividend downturns and they make strenuous efforts to avoid a decline. Almost every day the financial press reports firms making losses and yet still

paying a dividend. By continuing the income stream to shareholders the management signal that the decline in earnings is temporary and that positive earnings are expected in the future.

When times are good and profits are bounding ahead directors tend to be cautious about large dividend rises. To double or treble dividends in good years increases the risk of having to reduce dividends should the profit growth tail off and losing the virtue of predictability and stability cherished by shareholders.

Signals are funny things. A number of the large US technology companies started paying dividends for the first time in 2000–2004. In many cases the share price fell. The reason: investors took the dividends as a signal that the companies have run out of growth opportunities.

**Signals are funny things.**

### Resolution of uncertainty

Myron Gordon (1963) has argued that investors perceive that a company, by retaining and reinvesting a part of its current cash flow, is replacing a certain dividend flow to shareholders now with an uncertain more distant flow in the future. Because the returns from any reinvested funds will occur in the far future they are subject to more risk and investors apply a higher discount rate than they would to near-term dividends. The market places a greater value on shares offering higher near-term dividends. Investors are showing a preference for the early resolution of uncertainty. Under this model investors use a set of discount rates which rise through time to calculate share values; therefore the dividend valuation model becomes:

$$P_0 = \frac{d_1}{1 + k_{E1}} + \frac{d_2}{(1 + k_{E2})^2} + \dots + \frac{d_n}{(1 + k_{En})^n}$$

where:

$d$  = dividend

$k_{E1}$  = required return on equity capital by shareholder

significantly  $k_{E1} < k_{E2} < k_{E3} \dots$

The dividends received in Years 2, 3 or 4 are of lower risk than those received seven, eight or nine years hence.

The crucial factor here may not be actual differences in risk between the near and far future, but *perceived risk*. It may be that immediate dividends are valued more highly because the investors' perception of risk is not perfect. They overestimate the riskiness of distant dividends and thus undervalue them. However, whether the extra risk attached to more distant dividends is real or not, the effect is the same – investors prefer a higher dividend in the near term than they otherwise would and shareholder value can be raised by altering the dividend policy to suit this preference – or so the argument goes.

There have been some impressive counter-attacks on what is described as the 'bird-in-the-hand fallacy'. The riskiness of a firm's dividend derives from the risk associated with the underlying business and this risk is already allowed for through the risk-adjusted discount rate,  $k_E$ . To discount future income even further would be excessive. Take a company expected to produce a dividend per share of £1 in two years and £2 in ten years. The discount rate of, say, 15 percent ensures that the £2 dividend is worth, in present value terms, less than the dividend received in two years, and much of this discount rate is a compensation for risk.

$$\text{Present value of } \pounds 1 \text{ dividend} = \frac{\pounds 1}{(1.15)^2} = 75.6\text{p}$$

$$\text{Present value of } \pounds 2 \text{ dividend} = \frac{\pounds 2}{(1.15)^{10}} = 49.4\text{p}$$

Alternatively, take a company that pays out all its earnings in the hope of raising its share price because shareholders have supposedly had resolution of uncertainty. Now, what is the next move? We have a company in need of investment finance and shareholders wishing to invest in company shares – as most do with dividend income. The firm has a rights issue. In the prospectus the firm explains what will happen to the funds raised: they will be used to generate dividends in the future. Thus shareholders buy shares on the promise of future dividends; they discount these dividends at a risk-adjusted discount rate determined by the rate of return available on alternative, equally risky investments, say, 15 percent (applicable to *all* the future years). To discount at a higher rate would be to undervalue the shares and pass up an opportunity of a good investment.

## Agency effects

Many people take the view that UK firms pay out an excessive proportion of their earnings as dividends. The argument then runs that this stifles investment because of the lower retention rate. However, set alongside this concern should go the observation that many firms seem to have a policy of paying high dividends, and then, shortly afterwards, issuing new shares to raise cash for investment. This is a perplexing phenomenon. The cost of issuing shares can be burdensome and shareholders generally pay tax on the receipt of dividends. One possible answer is that it is the signaling (information) value of dividends that drives this policy. However, the costs are so high that it cannot always be explained by this. A second potential explanation lies with agency cost.

Managers (the agents) may not always act in the best interests of the owners (the principals). One way for the owners to regain some control over the use of their money is to insist on relatively high payout ratios. Then, if managers need funds for investment they have to ask. A firm that wishes to raise external capital will have its plans for investment scrutinized by a number of experts, including:

- investment bankers who advise on the issue;
- underwriters who, like investment bankers, will wish to examine the firm and its plans as they are attaching their good name to the issue;
- analysts at credit-rating agencies;
- analysts at stockbroking houses who advise shareholders and potential shareholders;
- shareholders.

In ordinary circumstances the firm's investors can only influence managerial action by voting at a general meeting (which is usually ineffective due to apathy and the use of proxy votes by the board), or by selling their shares. When a company has to ask for fresh capital investors can tease out more information and can examine managerial action and proposed actions. They can exercise some control over their savings by refusing to buy the firm's securities if they are at all suspicious of managerial behavior. Of particular concern is the problem of investment in projects with negative NPV for the sake of building a larger managerial empire.

## Scrap dividends

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A scrip dividend gives shareholders an opportunity to receive additional shares in proportion to their existing holding instead of the normal cash dividend. The shareholders can then either keep the shares or sell them for cash. From the company's point of view scrip dividends have the advantage that *cash does not*

**From the company's point of view scrip dividends have the advantage that *cash does not leave the company.***

*leave the company.* This may be important for companies going through difficult trading periods or as a way of adjusting the gearing (debt to equity) ratio. Shareholders may welcome a scrip dividend because they can increase their holdings without brokerage costs and other dealing costs.

An enhanced scrip dividend is one where the shares offered are worth substantially more than the alternative cash payout. Such an offer is designed to encourage the take-up of shares and is like a mini-rights issue.

## Share buy-backs and special dividends

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An alternative way to return money, held within the company, to the owners is to repurchase issued shares. In 2000 Shell was concerned that the retention of profits was causing the gearing level to become too low. The directors chose to return more cash by way of a buy-back scheme.

Buy-backs may also be a useful alternative when the company is unsure about the sustainability of a possible increase in the normal cash dividend. A stable policy may be pursued on dividends, then, as and when surplus cash arises, shares are repurchased. This two-track approach avoids sending an over-optimistic signal about future growth through underlying dividend levels.

**This two-track approach avoids sending an over-optimistic signal.**

A second possible approach to returning funds without signaling that all future dividends will be raised abnormally is to pay a special dividend. This is the same as a normal dividend but usually bigger and paid on a one-off basis.

Share repurchases have been permitted in the UK since the Companies Act 1981 came into force, subject to the requirement that the firm gain the permission of shareholders as well as warrant holders, option holders or convertible holders. The rules of the London Stock Exchange (and especially the Takeover Panel) must also be obeyed. These are generally aimed at avoiding the creation of an artificial market in the company's shares.

A special dividend has to be offered to all shareholders. However a share repurchase may not always be open to all shareholders as it can be accomplished in one of three ways:

- purchasing shares in the stock market;
- all shareholders are invited to tender some or all of their shares;
- an arrangement with particular shareholders.

Exhibit 14.4 discusses Cable and Wireless's decision to return cash to shareholders via both a special dividend and a share buy-back.

## A round-up of the arguments

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There are two questions at the core of the dividend policy debate.

*Question 1* Can shareholder wealth be increased by changing the pattern of dividends over a period of years?

*Question 2* Is a steady, stable dividend growth rate better than one which varies from year to year depending on the firm's internal need for funds?

The answer to the first question is 'yes'. The accumulated evidence suggests that shareholders for one reason or another value particular patterns of dividends across time. But there is no neat, simple, straightforward formula into which we can plug numbers to calculate the best pattern. It depends on numerous factors, many of which are unquantifiable, ranging from the type of clientele shareholder the firm is trying to attract to changes in the taxation system.

**There is no neat, simple, straightforward formula into which we can plug numbers to calculate the best pattern.**

## C&W opts for buy-back and special dividend

Dan Roberts

Cable and Wireless said yesterday there were few attractive acquisition targets for its remaining cash pile after deciding to return £1.8bn to shareholders.

However, Graham Wallace, chief executive, dismissed suggestions that the shortage of opportunities was a sign that it was a mistake to re-focus the group on internet services.

C&W will maintain a net cash position of approximately £3bn and continue to invest in its existing internet division, Cable and Wireless Global.

'The strength of our balance sheet is a real competitive advantage in these turbulent times,' said Mr Wallace. 'It is important to our customers and allows us to invest selectively for future growth.'...

The money will be returned to investors with the purchase of 15 per cent of its shares through an already agreed buy-back facility.

A further £320m will be paid out in an 11.5p-per-share special dividend, although cuts in both the interim and final dividend will mean that the total paid out for this year will be in line with last year's figure.

'Having listened to our shareholders, some of whom have pretty different views of the world, we consider that a combination of a buy-back and special dividend was most appropriate,' said Mr Wallace.

### EXHIBIT 14.4 C&W opts for buy-back and special dividend

Source: *Financial Times* 15 November 2001

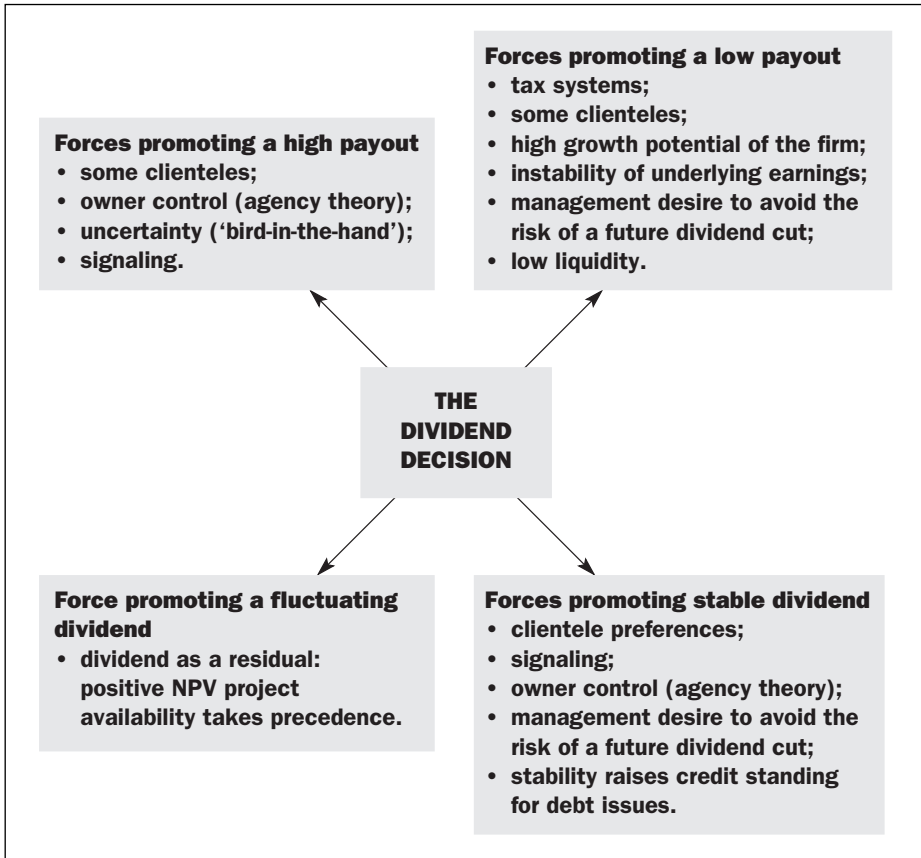
Taking the residual theory alone, the answer to Question 2 is that the dividend will vary from year to year because it is what is left over after the firm has retained funds for investment in all available projects with positive NPV. Dividends will be larger in years of high cash flow and few investment opportunities, and will be reduced when the need for reinvestment is high relative to internally generated cash flow. However, in practice, shareholders appear to prefer stable, consistent dividend growth rates. Many of them rely on a predictable stream of dividends to meet (or contribute to) their consumption needs. They would find an erratic dividend flow inconvenient. Investors also use dividend policy changes as an indication of a firm's prospects. A reduced dividend could send an incorrect signal and depress share prices.

So many factors influence dividend policy that it is very difficult to imagine that someone could develop a universally applicable model which would allow firms to identify an optimal payout ratio. Figure 14.1 shows the range of forces pulling managers towards a high payout rate, and other forces pulling towards a low payout rate. Simultaneously, their own forces encourage a fluctuating dividend and other factors promote a stable dividend.

Most of the factors in Figure 14.1 have already been explained, but there are two which need a comment here: liquidity and credit standing. Dividends

FIGURE 14.1

## The forces pulling management in the dividend decision



require an outflow of cash from firms; therefore companies with plentiful liquid assets, such as cash and marketable securities, are more able to pay a dividend. Other firms, despite being highly profitable, may have very few liquid assets. For example, a rapidly growing firm may have a large proportion of its funds absorbed by fixed assets, inventory and debtors. Thus some firms may have greater difficulty paying cash dividends than others.

Lenders generally prefer to entrust their money to stable firms rather than ones that are erratic, as this reduces risk. It could be speculated that a consistent dividend flow helps to raise the credit standing of the firm and lowers the interest rates payable. Creditors suffer from information asymmetry as much as shareholders and may look to this dividend decision for an indication of managerial confidence about the firm's prospects.



## Conclusion

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This section considers a possible practical dividend policy, taking into account the various arguments presented in the chapter.

Most large firms forecast their financial position for a few years ahead. Their forecasts will include projections for fixed capital expenditure and additional investment in working capital as well as sales, profits, etc. This information, combined with a specified target debt to equity ratio, allows an estimation of medium- to long-term cash flows.

These companies can then determine a dividend level that will leave sufficient retained earnings to meet the financing needs of their investment projects without having to resort to selling shares. (Not only does issuing shares involve costs of issue but investors sometimes view share issues as a negative omen.) Thus a *maintainable regular dividend* on a growth path is generally established. This has the virtue of providing some certainty to a particular clientele group and provides a stable background, to avoid sending misleading signals. At the same time the residual theory conclusions have been recognized, and (over, say, a five-year period) dividends are intended to be roughly the same as surplus cash flows after financing all investment in projects with a positive NPV. Agency costs are alleviated to the extent that managers do not, over the long run, store up (and misapply) cash flows greater than those necessary to finance high-return projects.

The future is uncertain and so companies may consider their financial projections under various scenarios. They may focus particularly on the negative possibilities. Dividends may be set at a level low enough that, if poorer trading conditions do occur, the firm is not forced to cut the dividend. Thus a margin for error is introduced by lowering the payout rate.

Companies that are especially vulnerable to macroeconomic vicissitudes, such as those in cyclical industries, are likely to be tempted to set a relatively low maintainable regular dividend so as to avoid the dreaded consequences of a reduced dividend in a particularly bad year. In years of plenty directors can pay out surplus cash in the form of special dividends or share repurchases. This policy of low regular payouts supplemented with irregular bonuses allows shareholders to recognize that the payouts in good years might not be maintained at the extraordinary level. Therefore they do not interpret them as a signal that profits growth will persist at this high level.

If a change in dividend policy becomes necessary then firms are advised to make a gradual adjustment, as a sudden break with a trend can send an erroneous signal about the firms' prospects. And, of course, the more information shareholders are given concerning the reasons behind a change in policy, the less likelihood there is of a serious misinterpretation.

Firms in different circumstances are likely to exhibit different payout ratios. Those with plentiful investment opportunities will, in general, opt for a relatively low dividend rate as compared with that exhibited by companies with few such

opportunities. Each type of firm is likely to attract a clientele favoring its dividend policy. For example investors in fast-growth, high-investment firms are prepared to accept low dividends in return for the prospect of higher capital gains.

### **A suggested action plan**

A suggested action plan for a dividend policy is as follows.

- 1 Forecast the 'surplus' cash flow resulting from the subtraction of the cash needed for investment projects from that generated by the firm's operations over the medium to long term.
- 2 Pay a maintainable regular dividend based on this forecast. This may be biased on the conservative side to allow for uncertainty about future cash flows.
- 3 If cash flows are greater than projected for a particular year, keep the maintainable regular dividend fairly constant (with constant growth, that is), but pay a special dividend or initiate a share repurchase program. If the change in cash flows is permanent, gradually shift the maintainable regular dividend while providing as much information to investors as possible about the reasons for the change in policy.

### **Notes**

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- 1 The CPI, consumer price index, is the main US measure of inflation.
- 2 The complicating effect of capital structure on firms' value is usually eliminated by concentrating on all-equity firms.
- 3 The following researchers present evidence on the clientele effect: Elton and Gruber (1970), Pettit (1977), Lewellen, Stanley, Lease and Schlarbaum (1978), Litzenberger and Ramaswamy (1982), Crossland, Dempsey and Moizer (1991).
- 4 Gordon Brown, Chancellor of the Exchequer, Budget Speech, 2 July 1997.
- 5 Lintner (1956) and 3i (1993) survey, in which 93 percent of finance directors agreed with the statement that 'dividend policy should follow a long-term trend in earnings'.



# Section III:

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## **FINANCE RAISING**



## DEBT FINANCE AVAILABLE TO FIRMS OF ALL SIZES

**Introduction**

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**Contrasting debt finance with equity**

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**Bank borrowing**

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**Overdraft**

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**Term loans**

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**Trade credit**

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**Factoring**

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**Hire purchase**

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**Leasing**

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**Bills of exchange**

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**Acceptance credits (bank bills or banker's acceptance)**

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**Conclusion**

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## Introduction

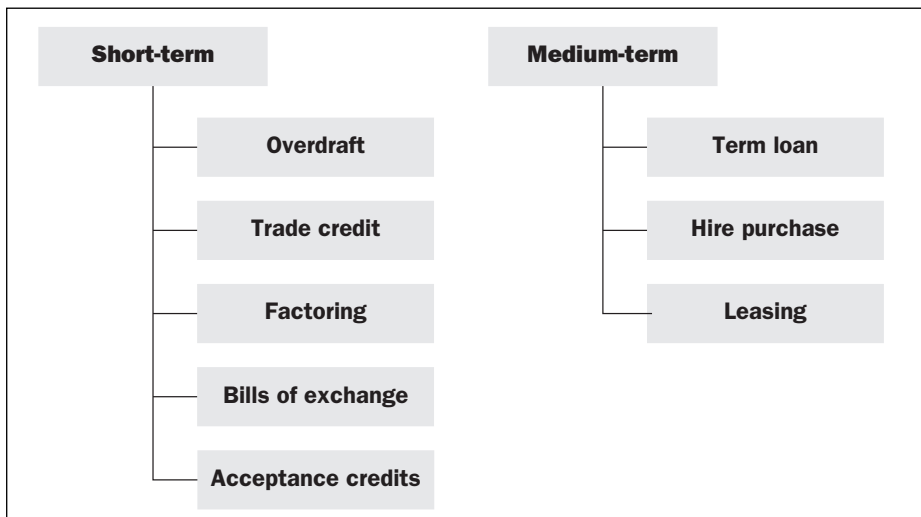
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For many firms, especially smaller ones, a combination of overdrafts and loans, trade credit, leasing and hire purchase make up the greater part of the funding needs. Large companies have access to stock markets, bond markets and syndicated loan facilities. These are often closed to the smaller firm, so, to pursue their expansion programs, they turn to the local banks and the finance houses as well as their suppliers for the wherewithal to grow. The giants of the corporate world have access to dozens of different types of finance, but they too value the characteristics, cheapness and flexibility of the forms discussed in this chapter.

All the forms of finance discussed in this chapter are described as either short- or medium-term finance (with the exception of some bank loans). The definitions of short-term and medium-term finance are not clear-cut. Usually finance repayable within a year is regarded as short, whereas that due for repayment between one and seven years is taken to be medium. But these cut-offs are not to be taken too seriously. Quite often an overdraft facility, which is due for repayment in, say, six months or one year, is regularly 'rolled over' and so may become relied upon as a medium-term, or even long-term, source of funds. Leasing, which is usually classified as a medium-term source, can be used for periods of up to 15 years in some circumstances, in others it is possible to lease assets for a period of only a few weeks, for example, a computer or photocopier. The forms of finance we will examine in this chapter are listed in Figure 15.1.

**FIGURE 15.1**

**The main forms of short-term and medium-term finance**



## Contrasting debt finance with equity

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### What is debt?

Put at its simplest, debt is something that has to be repaid. Corporate debt repayments generally take the form of interest and capital payments, but they can be more exotic compensations such as commodities and shares. The usual method is a combination of a regular interest, with capital (principal) repayments either spread over a period or given as a lump sum at the end of the borrowing.

**Debt is something that has to be repaid.**

### Cost of debt

Debt finance is less expensive to the firm than equity (ordinary shares) finance, not only because the costs of raising the funds (for example, arrangement fees with a bank or the issue costs of a bond) are lower, but because the rate of return required to attract investors is less than for equity. This is because investors recognize that investing in a firm via debt finance is less risky than investing via shares. It is less risky because interest has a higher claim than equity holders on income generated by the company – interest has to be paid even if that means there is nothing left to pay the shareholders a dividend. There is thus a greater certainty of receiving a return than there is for equity holders. Also, if the firm goes into liquidation, the holders of a debt type of financial security are paid back from the sale of the assets before shareholders receive anything. Thus we say that debt holders ‘rank’ higher than equity holders for annual payouts and liquidation proceeds.

### Extraordinary profits go to shareholders

Offsetting these plus-points for debt (from the debt holders point of view) is the fact that lenders do not, generally, share in the value created by an extraordinarily successful business. They usually receive the contractual minimum and no more, whereas shareholders can gain much more than the minimum required because they are the recipients of any surplus the firm generates. In the case of high performing businesses this can result in an initial share investment of a few thousand pounds being turned into many millions.

### Voting rights

Another disadvantage with debt is that the lenders do not, in normal circumstances, have any voting power over the company’s direction, for example, choosing the directors, agreeing to a merger or voting for a dividend payment.



Having said this, debt holders are able to protect their position to some extent through rigorous lending agreements and if these are breached they may be able to take control of a company. These lending agreements may, for instance, insist that the company does not exceed certain debt level relative to the amount shareholders hold in the company, or that annual interest does not exceed a stated multiple of annual profits.

### Shock absorption

The fact that debt finance usually requires regular cash outlays in the form of interest and the repayment of a capital sum means that the firm is obliged to maintain payments through bad times as well as good, or face the possibility of the lenders taking action to recover their dues by forcing the sale of assets or liquidation. High debt levels therefore pose a risk to the existence of the company

**High debt levels therefore pose a risk to the existence of the company.**

– a poor performance over a few years can wipe out shareholders' wealth as the firm digs into the equity base to pay the debt obligations (for a consideration of when debt levels become too great see Chapters 10 and 18). The fact that shares carry no right to pay a

dividend or to ever repay the capital allows them to act as shock absorbers for the company. When losses are made the company does not have the problem of finding money for a dividend.

### Tax deductibility

When a company pays interest the tax authorities regard this as a cost of doing business and it can be used to reduce the taxable profit. This lowers the effective cost to the firm of servicing the debt compared with servicing equity capital through dividends, which are not tax deductible (see Chapter 10). To the attractions of the low required return on debt we must add the benefit of tax deductibility.

### Collateral and restrictions

Institutions providing debt finance often try to minimize the risk of not receiving interest and their original capital. They do this by first of all looking to the earning ability of the firm, that is, the pre-interest profits in the years over the period of the loan. As a back-up they often require that the loan be secured against assets owned by the business, so that if the firm is unable to pay interest and capital from profits the lender can force the sale of the assets to receive their legal entitlement. The matter of security has to be thought about carefully before a firm borrows capital. It could be very inconvenient for the firm to grant a bank a fixed charge on a specific asset – say a particular building – because the firm is then limiting its future flexibility to use its assets as it wishes. For instance, it will not be able to sell that building, or even rent it without the consent of the bank or the bondholders.

## Bank borrowing

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For most companies and individuals banks remain the main source of externally (i.e. not retained profits) raised finance. Ten years ago the most common form of bank borrowing was the overdraft facility. As we shall see there has been a remarkable shift, so that now the term loan has come to dominate.

Borrowing from banks is attractive for companies for the following reasons:

- *It is quick* The key provisions of a bank loan can be worked out speedily and the funding facility can be in place within a matter of hours. Contrast this with a bond issue or arranging factoring (see below) which both require a lot of preparation.
- *It is flexible* If the economic circumstances facing the firm should change during the life of the loan banks are generally better equipped – and are more willing – to alter the terms of the lending agreement than bondholders. If the firm does better than originally expected a bank overdraft (and some loans) can be repaid without penalty. Contrast this with many bonds with fixed redemption dates, or hire purchase/leasing agreements with fixed terms. Negotiating with a single lender in a crisis has distinct advantages (with bond finance there might be thousands of lenders – see next chapter).
- *It is available to small firms* Bank loans are available to firms of almost any size whereas the bond or money markets are for the big players only.
- *Administrative and legal costs are low* Because the loan arises from direct negotiation between borrower and lender there is an avoidance of the marketing, arrangement, regulatory and underwriting expenses involved in a bond issue (see Chapter 16).

### Factors for a firm to consider

There are a number of issues a firm needs to address when considering bank borrowing.

#### Costs

The borrower may be required to pay an arrangement fee, say 1 percent of the loan, at the time of the initial lending, but this is subject to negotiation and may be bargained down. The interest rate can be either fixed for the entire term of the loan (or part of it) or floating. If it is floating then the rate will generally be a certain percentage above the bank's base rate or the London Inter-Bank Offered Rate (LIBOR). LIBOR is the rate at which very safe banks lend to each other in the financial markets. This can be lending for as short as a few hours (overnight LIBOR) or for much longer periods, say three or six months.

Customers in a good bargaining position may be able to haggle so that they pay only 1 or 2 percent 'over base', or over say, 'three-month LIBOR'. In the case of the three-month LIBOR benchmark rate the interest payable changes every three months depending on the rates in the market for three-month lending between high

quality banks. Because the borrowing corporation is not as safe as a high quality bank borrowing in the interbank market it will pay 1 percent (or 100 basis points), 2 percent (200 basis points) or some other number of basis points per year more than the high quality bank would. In the case of base-rate related lending the interest payable changes immediately the bank announces a change in its base rate. This moves at irregular intervals in response to financial market conditions, which are heavily influenced by the Bank of England in its attempts to control the economy.

For customers in a poorer bargaining position, offering a higher risk proposal, the rate could be 5 percent or more over the base rate or LIBOR. The interest rate will be determined not only by the riskiness of the undertaking and the bargaining strength of the customer but also by the degree of security for the loan and the size of loan. Furthermore, economies of scale in lending mean that large borrowers pay a lower interest rate.

A generation ago it would have been more normal to negotiate fixed-rate loans but sharp movements of interest rates in the 1970s and 1980s meant that banks and borrowers were less willing to make this type of long-term commitment. Most loans today are 'variable rate'. Floating-rate borrowings have advantages for the firm over fixed-rate borrowings:

- if interest rates fall the cost of the loan falls;
- at the time of arrangement fixed rates are usually above floating rates (to allow for lenders' risk of misforecasting future interest rates);
- returns on the firm's assets may go up at times of higher interest rates and fall at times of low interest rates, therefore the risk of higher rates is offset. For example, a bailiff firm may prosper in a high interest rate environment and can cope with higher interest charged to its business borrowing.

However floating rates have some disadvantages:

- the firm may be caught out by a rise in interest rates if, as with most businesses, its profits do not rise when interest rates rise. Many have failed because of a rise in interest rates at an inopportune time;
- there will be uncertainty about the precise cash outflow impact of the interest payable. Firms need to plan ahead; in particular, they need to estimate amounts of cash coming in and flowing out, not least so that they can pay bills on time. If the firm has large amounts of floating rate debt it has an extra element of uncertainty in estimating cash flows and thus greater difficulty in managing the business efficiently.

### Security

When banks are considering the provision of debt finance for a firm they will be concerned about the borrower's competence and honesty. They need to evaluate the proposed project and assess the degree of managerial commitment to its success. The firm will have to explain why the funds are needed and provide detailed cash forecasts covering the period of the loan. Between the bank and the firm stands the classic gulf called 'asymmetric information' in which one party in the

negotiation is ignorant of, or cannot observe, some of the information that is essential to the contracting and decision-making process. The bank is unable to accurately assess the ability and determination of the managerial team and will not have a complete understanding of the market environment in which they propose to operate. Companies may overcome bank uncertainty to some degree by providing as much information as possible at the outset and keeping the bank informed of the firm's position as the project progresses.

**Between the bank and the firm stands the classic gulf called 'asymmetric information'.**

The finance director and managing director need to consider both the quantity and quality of information flows to the bank. An improved flow of information can lead to a better and more supportive relationship. Firms with significant bank financing requirements to fund growth will be well advised to cultivate and strengthen understanding and rapport with its bank(s). The time to lay the foundations for subsequent borrowing is when the business does not need the money so that when loans are required there is a reasonable chance of being able to borrow the amount needed on acceptable terms.

Another way for a bank to reduce its risk is to ensure that the firm offers sufficient collateral for the loan. Collateral provides a means of recovering all or the majority of the bank's investment should the firm fail. The bank's loan can be secured by either a fixed or a floating charge against the firm's assets. A fixed charge means that specific assets are used as security which, in the event of default, can be sold at the insistence of the lender(s) and the proceeds used to repay them. A floating charge means that the loan is secured by a general charge on all the assets of the corporation. In this case the company has a large degree of freedom to use its assets as it wishes, such as sell them or rent them out, until it commits a default which 'crystallizes' the floating charge. If this happens a receiver will be appointed with powers to dispose of assets and to distribute the proceeds to the creditors. Even though floating-charge lenders can force liquidation, fixed-charge lenders rank above floating-charge debt holders in the payout after insolvency – they get paid first, if there is anything left then the floating charge lenders receive something.

Collateral can include stocks, debtors and equipment as well as land, buildings and marketable investments such as shares in other companies. In theory banks often have this strong right to seize assets or begin proceedings to liquidate. In practice they are reluctant to use these powers because the realization of full value from an asset used as security is sometimes difficult and such Draconian action can bring adverse publicity.

Banks are careful to create a margin for error in the assignment of sufficient collateral to cover the loan because, in the event of default, assigned assets usually command a much lower price than their value to the company as a going concern. A quick sale at auction produces bargains for the buyers of liquidated assets.

Another safety feature applied by banks is the requirement that the firm abide by a number of loan covenants which place restrictions on managerial action, for example insisting that annual profits be at least four times annual interest in every year while the loan is outstanding.

Finally, lenders can turn to the directors of the firm to provide additional security. They might be asked to sign personal guarantees that the firm will not default. Personal assets (such as homes) may be used as collateral. This erodes the principle of limited liability status and is likely to inhibit risk-taking productive activity. However for many smaller firms it is the only way of securing a loan and at least it demonstrates the commitment of the director to the success of the enterprise.

### Repayment

A firm must carefully consider the period of the loan and the repayment schedules in the light of its future cash flows. It could be disastrous, for instance, for a firm engaging in a capital project which involved large outlays for the next five years followed by cash inflows thereafter to have a bank loan which required significant interest and principal payments in the near term. For situations like these, repayment holidays or grace periods may be granted, with the majority of the repayment being made once cash flows are sufficiently positive.

It may be possible for a company to borrow by means of a mortgage on freehold property in which repayments of principal plus interest may be spread over long periods of time. The rate charged will be a small margin over the base interest rate or LIBOR. The main advantage of a mortgage is that ownership of the property remains with the mortgagee (the borrowing firm) and therefore the benefits that come from the ownership of an asset, which may appreciate, are not lost.

A proportion of the interest and the principal can be repaid monthly or annually and can be varied to correspond with the borrower's cash flows. It is rare for there to be no repayment of the principal during the life of the loan but it is possible to request that the bulk of the principal is paid in the later years. Banks generally prefer self-amortizing term loans with a high proportion of the principal paid off each year. This has the advantage of reducing risk by imposing a program of debt reduction on the borrowing firm.

The repayment schedule agreed between bank and borrower is capable of infinite variety – four possibilities are shown in Table 15.1.

The retail and merchant banks are not the only sources of long-term loans. Insurance companies and other specialist institutions such as 3i will also provide long-term debt finance.

### Overdraft

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Usually the amount that can be withdrawn from a bank account is limited to the amount put in. However business and other financial activity often requires some flexibility in this principle, and it is often useful to make an arrangement to take more money out of a bank account than it contains – this is an overdraft.

An overdraft is a permit to overdraw on an account up to a stated limit.

**TABLE 15.1**  
**Example of loan repayment arrangements**

**£10,000 borrowed, repayable over four years with interest at 10% pa (assuming annual payments, not monthly)**

(a) <i>Time period (years)</i>	1	2	3	4
Payment (£)	3,155	3,155	3,155	3,155
(b) <i>Time period (years)</i>	1	2	3	4
Payment (£)	1,000	1,000	1,000	11,000
(c) <i>Time period (years)</i>	1	2	3	4
Payment (£)	0	0	0	14,641
(d) <i>Time period (years)</i>	1	2	3	4
Payment (£)	0	1,000	6,000	6,831

Overdraft facilities are usually arranged for a period of a few months or a year and interest is charged on the excess drawings.

## Advantages

Overdrafts have the following advantages.

1. *Flexibility* The borrowing firm is not asked to forecast the precise amount and duration of its borrowing at the outset but has the flexibility to borrow up to a stated limit. Also the borrower is assured that the moment the funds are no longer required they can be quickly and easily repaid without suffering a penalty.
2. *Cheapness* Banks usually charge two to five percentage points over base rate (or LIBOR) depending on the creditworthiness, security offered and bargaining position of the borrower. There may also be an arrangement fee of, say, 1 per cent of the facility. These charges may seem high but it must be borne in mind that overdrafts are often loans to smaller and riskier firms that would otherwise have to pay much more for their funds. Large and well-established borrowers with low gearing and plenty of collateral can borrow on overdraft at much more advantageous rates. A major saving comes from the fact that the banks charge interest on only the daily outstanding balance. So, if a firm has a large cash inflow one week it can use this to reduce its overdraft, temporarily lowering the interest payable, while retaining the ability to borrow more another week.

## Drawbacks

A major drawback to an overdraft is that the bank retains the right to withdraw the facility at short notice. A heavily indebted firm may receive a letter from the bank insisting that its account be brought to balance within a matter of days.

**It is not usually wise to use the money for an asset that cannot be easily liquidated.**

This right lowers the risk to the lender because it can quickly get its money out of a troubled company, which allows it to lower the cost of lending. However, it can be devastating for the borrower and so firms are well advised to think through the use to which

finance provided by way of an overdraft is put. It is not usually wise to use the money for an asset that cannot be easily liquidated; for example, it could be problematic if an overdraft is used for a bridge-building project which will take three years to come to fruition.

The age-old convention of attaching the right of the bank to withdraw the overdraft facility to a loan agreement was flouted by NatWest in 2000 – *see* Exhibit 15.1.

With overdrafts the bank may take either a fixed or a floating charge over the firm's assets. It will also be on the look out for other forms of security, e.g. a personal guarantee of the directors or owners of the business (if the company defaults the bank can force the directors to pay off the loan from their own resources). When Sir Richard Branson borrowed from Lloyds TSB the bank took shares owned by Sir Richard in Virgin Atlantic as security. Note that, unusually, the overdraft facility extended to three years – *see* Exhibit 15.2.

## Seasonal businesses

Overdrafts are particularly useful for seasonal businesses because the daily debit-balance interest charge and the absence of a penalty for early repayment mean that this form of finance can be cheaper than a loan. Take the case of Fruit Growers plc (Worked example 15.1).

### NatWest deletes overdraft clause

Jim Pickard

Campaigners for small companies claimed a victory yesterday after NatWest bank abolished its right to remove a customer's overdraft at a moment's notice.

NatWest said it would turn current industry practice on its head by deleting

the 'repayable on demand' clause from its small business overdrafts.

The bank said it would end the uncertainty faced by SMEs by ensuring that a three, six or 12 month overdraft meant exactly that. The conditions will apply to both secured and unsecured overdrafts.

## EXHIBIT 15.1 Natwest deletes overdraft clause

Source: *Financial Times* 21 November 2000

## Branson wins £17m loan facility increase

Francesco Guerrera and Thorold Barker

Sir Richard Branson can borrow a further £17m from Lloyds TSB under a loan facility backed by Virgin Group's controlling stake in Virgin Atlantic, the prize of his business empire.

Virgin said yesterday it had mortgaged his 51 per cent stake in the Virgin Atlantic in exchange for a £67m three-year facility from Lloyds.

Sir Richard's group has already used £50m of the overdraft facility on new businesses, including US and Australian mobile phone ventures and the acquisition of a chain of South African health clubs.

### EXHIBIT 15.2 Branson wins £17m loan facility increase

Source: *Financial Times* 12 June 2001

## Worked example 15.1 FRUIT GROWERS PLC

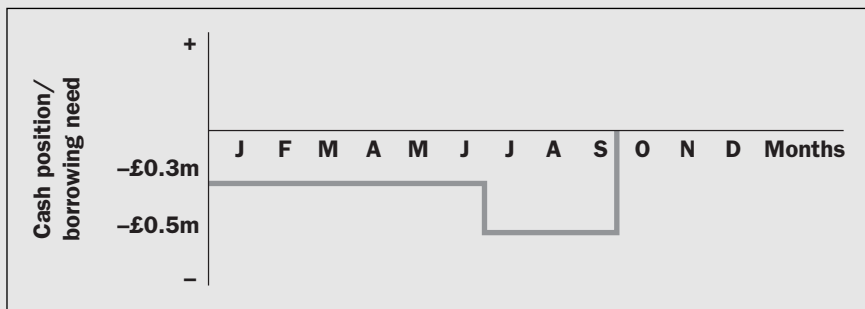
The management of Fruit Growers plc are trying to decide whether to obtain financing from an overdraft or a loan. The interest on both would be 10% per year or 2.5% per quarter. The cash position for the forthcoming year is represented in Figure 15.2.

### Option 1. A loan for the whole year

A loan for the whole year has the advantage of greater certainty that the lending facility will be in place throughout the year. A total loan of £0.5m will be needed, and this will be repaid at the end of the year with interest. At the beginning of the year Fruit Growers' account is credited with the full £500,000. For the months when the business does not need the £500,000 the surplus can be invested to receive a return of 2% per quarter.

FIGURE 15.2

Monthly cash flow balance for Fruit Growers plc





**Cost of a loan for the whole year**

Interest charged $500,000 \times 10\%$	=	£50,000
Less interest receivable when surplus funds earn 2% per quarter		
January–June $200,000 \times 4\%$	=	£8,000
October–December $500,000 \times 2\%$	=	£10,000
Total cost of borrowing	=	<u>£32,000</u>

**Option 2. An overdraft facility for £500,000**

An overdraft facility for £500,000 has the drawback that the facility might be withdrawn at any time during the year – however, it is cheaper.

**Costs of an overdraft facility for £500,000**

1st quarter (J, F & M) $300,000 \times 2.5\%$	=	£7,500
2nd quarter (A, M & J) $300,000 \times 2.5\%$	=	£7,500
3rd quarter (J, A & S) $500,000 \times 2.5\%$	=	£12,500
4th quarter (O, N & D)	=	<u>£0</u>
Total cost of borrowing	=	<u>£27,500</u>

*Note:* We will ignore the complications of compounding intra-year interest.

**Criticism of banks**

The risk of a sudden withdrawal of an overdraft facility for most firms is very slight: banks do not generate goodwill and good publicity by capriciously and lightly canceling agreed overdrafts. The high street banks came in for strong criticism in the early 1990s: ‘In 1993 the best that could be said about the relationship between banks and their small firm customers was that both sides were in a state of armed neutrality’ (Howard Davies, Deputy Governor of the Bank of England, 1996). They were said to have failed to lower interest rates to small firms to the same extent as general base rates (a charge of which the Bank of England said they were not guilty), of not supporting start-ups, of having excessive fees, of being too ready to close down a business and being too focussed on property-based security backing rather than looking at the cash flows of the proposed activity.

**The best that could be said about the relationship between banks and their small firm customers was that both sides were in a state of armed neutrality.**

A number of these areas of contention have been addressed and matters are said to be improving. One particular problem with UK lending was said to be the excessive use of the overdraft facility when compared with other countries that used term

A number of these areas of contention have been addressed and matters are said to be improving. One particular problem with UK lending was said to be the excessive use of the overdraft facility when compared with other countries that used term

loans more extensively. In the 1980s between one-half and two-thirds of bank lending to small firms was in the form of overdrafts. A high proportion of these were rearranged at the end of each year for another 12 months ('rolled over') and so, in effect, became a medium-term source of finance. The disadvantages of this policy are that each overdraft renewal involves arrangement fees as well as the risk of not reaching an agreement and, therefore, the funding being withdrawn. It became obvious that a longer-term loan arrangement was more suitable for many firms and the banks pushed harder on this front. As a result, between 1993 and 1998, the proportion of bank lending to small firms represented by overdrafts declined from 49 to 30 percent, with term lending rising to 70 percent.

The relationship between banks and small businesses is said to have improved during the 1990s – see Exhibit 15.3.

## Banks boost links with small businesses

### Study expects switch to medium-term loans will bolster defences against economic swings

Andrew Balls

Small businesses are less vulnerable to the swings of the economic cycle than in the past because they rely less on bank overdrafts and more on medium-term bank loans with fixed repayments ...

... 'Banks are now more locked into the provision of finance to the small-firm sector throughout the economic cycle.' Banks' codes of practice for small business and improved British Bankers' Association industry standards for dealing with small businesses, have led to 'a more open, two-way relationship' between banks and small companies.

Banks now have better warning systems to highlight businesses that are getting into difficulty, and small companies appear more prepared to share information. The study, *The Financing of Small Firms in the UK*, says: 'Better relations and a greater degree of co-operation should help to avoid some of the strains of the previous recession, which contributed to increased business

failures and seriously affected the reputation of the banks.'

Better sharing of information also means banks are levying lower charges, requiring less collateral, and offering fixed-rate loans rather than overdraft facilities tied to short-term interest rates.

The balance between overdraft and term-lending was equally split in 1992. By 1998, term-lending accounted for 70 per cent of the total. Two thirds of banks' committed funds have maturities of more than five years.

As a percentage of total small-business finance, bank lending has fallen from 61 per cent in 1990 to 47 per cent in 1997. Hire purchasing and leasing has risen from 16 per cent to 27 per cent over the same period. Only 39 per cent of small businesses sought external finance in 1995–97, compared with 65 per cent in 1987–90. Small businesses are also relying more on internally generated funds than in the past, the Bank says.

## EXHIBIT 15.3 Banks boost links with small businesses

Source: *Financial Times* 17 May 1999

## Term loans

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A term loan is a loan of a fixed amount for an agreed time and on specified terms. These loans are normally for a period of between three and seven years, but they can range from one to 20 years. The specified terms will include provisions regarding the repayment schedule. If the borrower is to apply the funds to a project which will not generate income for perhaps the first three years it may be possible to arrange a grace period during which only the interest is paid, with the capital being paid off once the project has a sufficiently positive cash flow. Other arrangements can be made to reflect the pattern of cash flow of the firm or project: for example a 'balloon' payment structure is one when only a small part of the capital is repaid during the main part of the loan period, with the majority repayable as the maturity date approaches. A 'bullet' repayment arrangement takes this one stage further and provides for all the capital to be repaid at the end of the loan term.

Not all term loans are drawn down in a single lump sum at the time of the agreement. In the case of a construction project which needs to keep adding to its borrowing to pay for the different stages of development, an instalment arrangement might be required with, say, 25 percent of the money being made available immediately, 25 percent at foundation stage and so on. This has the added attraction to the lender of not committing large sums secured against an asset not yet created. From the borrower's point of view a drawdown arrangement has an advantage over an overdraft in that the lender is committed to providing the finance if the borrower meets prearranged conditions, whereas with an overdraft the lender can withdraw the arrangement at short notice.

The interest charged on term loans can be either at fixed or floating rates. In addition to the interest rate, the borrower will pay an arrangement fee which will largely depend on the relative bargaining strength of the two parties.

A term loan often has much more accompanying documentation than an overdraft because of the lengthy bank commitment. This will include a set of obligations imposed on the borrowing firm such as information flows to the bank as well as financial gearing (debt to equity capital ratio) and liquidity (availability of funds to meet claims) constraints. If these financial ratio limits are breached or interest and capital is not paid on the due date the bank has a right of termination, in which case it could decide not to make any more funds available, or, in extreme cases, insist on the repayment of funds already lent. Even if a firm defaults the bank will usually try to reschedule or restructure the finance of the business (e.g. grant a longer period to pay) rather than take tough enforcement action.

## Trade credit

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The simplest and most important source of short-term finance for many firms is trade credit. This means that when goods or services are delivered to a firm for use

in its production they are not paid for immediately. These goods and services can then be used to produce income before the invoice has to be paid.

**The most important source of short-term finance for many firms is trade credit.**

The writer has been involved with a number of small business enterprises, one of which was a small retail business engaged in the selling of crockery and glassware – Crocks. Reproduced, as Figure 15.3, is an example of a real invoice (with a few modifications to hide the identity of the supplier). When we first started buying from this supplier we, as a matter of course, applied for trade credit. We received the usual response, that the supplier requires two references vouching for our trustworthiness from other suppliers that have granted us trade credit in the past, plus a reference from our bankers. Once these confidential references were accepted by the supplier we were granted normal credit terms for retailers of our type of product, that is, 30 days to pay from the date of delivery. One of the things you learn in business is that agreements of this kind are subject to some flexibility. We found that this supplier does not get too upset if you go over the 30 days and pay around day 60: the supplier will still supply to the business on normal credit terms even if you do this on a regular basis.

Each time supplies were delivered by this firm we had to make a decision about when to pay. Option 1 is to pay on the 14th day to receive  $2\frac{1}{2}$  percent discount – see note at the bottom of the invoice. Option 2 is to take 60 days to pay. (Note: with Option 1 the  $2\frac{1}{2}$  percent deduction is on the ‘nett goods’ amount which is the value of the invoice before value added tax (VAT) is added, that is £217.30.)

#### *Option 1*

$$£217.30 \times 0.025 = £5.43$$

So, we could knock £5.43 off the bill if we paid it 14 days after delivery. This looks good but we do not yet know whether it is better than the second option.

#### *Option 2*

This business had an overdraft, so if we could avoid taking money from the bank account the interest charge would be less. How much interest could be saved by taking an additional 46 days (60 days – 14 days) to pay this invoice? Assuming the annual percentage rate (APR) charged on the overdraft is 10 percent the daily interest charge is:

$$(1 + d)^{365} = 1 + i$$

where:

$d$  = daily interest, and  $i$  = annual interest

$$d = \sqrt[365]{(1 + i)} - 1$$

$$\sqrt[365]{(1 + 0.1)} - 1 = 0.00026116$$

Interest charge for 46 days:

$$(1 + 0.00026116)^{46} - 1 = 0.01208 \text{ or } 1.208\%$$

$$(255.33 - 5.43) \times 0.01208 = £3.02$$

**FIGURE 15.3**  
**A typical invoice**

Supplier XYZ plc	Invoice number 501360
54 West Street, Sussex	Date 29/02/98
Invoice address	Branch address
Crocks	Crocks
Melton Mowbray	Grantham
Leics	Lincolnshire
LE13 1XH	

INVOICE

Account	Customer order No.	Sales order	Carrier	AEP	Despatch No.	Due date	Page
T02251	81535	T01537		090	000067981	28/03/98	1

Item	Part code	Description	Unit of sale	Quantity despatched	Unit price	%	Amount	VAT code
1	1398973	Long glass	Each	12	0.84	0.00	10.08	0
2	12810357	Tumbler	Each	12	0.84	0.00	10.08	0
3	1395731	Plate	Each	60	1.10	0.00	66.00	0
4	1258732	Bowls	Each	30	4.23	0.00	126.90	0
5	1310102	Cup	Each	1	4.24	0.00	4.24	0
		VAT 0:						
		217.30 @						
		17.5%						

Nett goods	217.30
Charges	0.00
VAT	38.03
	255.33

Note our settlement terms:  $2\frac{1}{2}\%$  discount may be deducted for payment within 14 days of invoice date; otherwise due 30 days strictly nett.

Thus £3.02 interest is saved by delaying payment to the 60th day, compared with a saving of over £5 on the option of paying early. In this particular case taking extended trade credit is not the cheapest source of finance; it is cheaper to use the overdraft facility.

Many suppliers to our business did not offer a discount for early settlement. This gives the impression that trade credit finance is a free source of funds, so

the logical course of action is to get as much trade credit as possible. The system is therefore open to abuse. However, a supplier will become tired of dealing with a persistent late payer and will refuse to supply, or will only supply on a basis of payment in advance. Another point to be borne in mind is that gaining a bad reputation in the business community may affect relationships with other suppliers.

## Advantages

Trade credit has the following advantages.

1. *Convenient/informal/cheap* Trade credit has become a normal part of business in most product markets.
2. *Available to companies of any size* Small companies, especially fast-growing ones, often have a very limited range of sources of finance to turn to. Banks frequently restrict overdrafts and loans to the asset backing available.

## Factors determining the terms of trade credit

### Tradition within the industry

Customs have been established in many industries concerning the granting of trade credit. Individual suppliers are often unwise to step outside these traditions because they may lose sales. Figure 15.4 shows the number of days it takes customers of the firms in the listed industries to pay their bills. There is quite a large variation between industries; for retailers where most sales are completed on zero credit terms the average period is only a few days, whereas in the metal goods sector 11 weeks is considered the norm.

### Bargaining strength of the two parties

If the supplier has numerous customers, each wanting to purchase the product in a particular region, and the supplier wishes to have only one outlet then it may decide not to supply to those firms which demand extended trade credit. On the other hand, if the supplier is selling into a highly competitive market where the buyer has many alternative sources of supply, credit might be used to give a competitive edge.

### Product type

Products with a high level of turnover relative to stock levels carried by firms are generally sold on short credit terms, for example food. The main reason is that these products usually sell on a low profit margin and the delay in payment can cause the money tied up in trade credit to grow to a very large sum very quickly. This can have a large impact on the cash resources and profit margin of the supplier.

**FIGURE 15.4**

**Credit period days taken by customers of East and West Midlands medium-sized firms**

	Credit period (days)	
	East Mids	West Mids
1 Chemicals	68	64
2 Metal goods	75	74
3 Mechanical engineering	74	77
4 Electrical and electronic engineering	72	78
5 Rubber and plastics	72	71
6 Textiles	49	60
7 Footwear and clothing	42	48
8 Food, drink and tobacco	37	39
9 Paper, print and publishing	68	66
10 Construction	44	46
11 Wholesale distribution	56	70
12 Retail distribution	19	20
13 Business services	80	64

Source: G.C. Arnold and P Davis (1995) *Profitability trends in West Midlands Industries. A Study for Lloyds Bowmaker*. Edinburgh: Lloyds Bowmaker. Reprinted with permission of Lloyds UDT Limited.

## Factoring

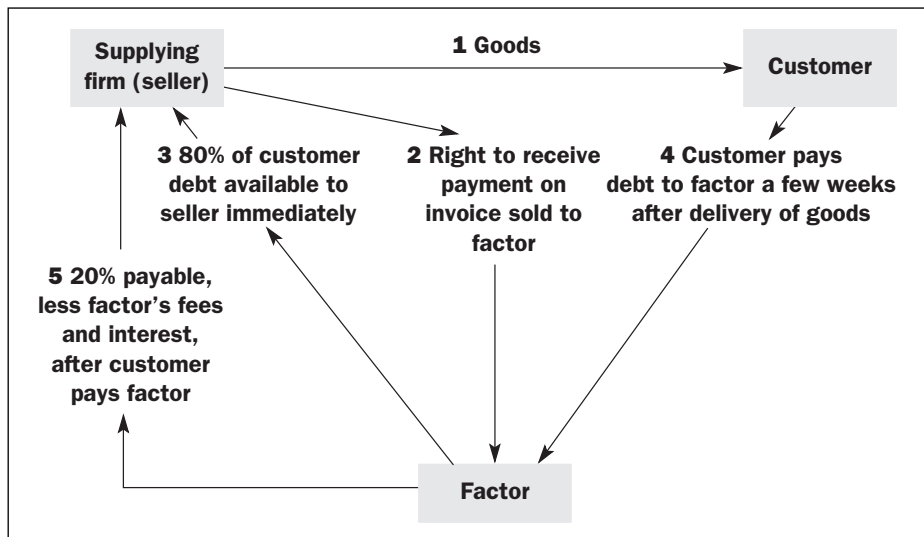
To receive trade credit is a bonus for customer firms. However, this common practice also brings a burden to the firms supplying this form of finance. For many companies the amount owed by customers at any one time (debtor balances) is a multiple of their monthly turnover. For a medium-sized firm this can amount to millions of pounds. Costs, e.g. wages, have flowed out but customers are yet to pay – which can impose a severe strain on the ability of the firm to meet its obligations as they fall due.

Factoring (or ‘invoice finance’) companies provide three services to firms with outstanding debtors, the most important of which, in the context of this chapter, is the immediate transfer of cash. This is provided by the factor on the understanding that when invoices are paid by customers the proceeds will go to them. Factoring is increasingly used by companies of all sizes as a way of meeting cash flow needs induced by rising sales and debtor balances. About 80 percent of factoring turnover is handled by the clearing bank subsidiaries, e.g. HSBC Invoice Finance, Alex Lawrie (Lloyds TSB) and Royal Bank of Scotland Commercial Services. However there are dozens of smaller factoring companies. Three closely related services are offered by factors. These are: the provision of finance, sales ledger administration and credit insurance.

## The provision of finance

At any one time a typical business can have one-fifth or more of its annual turnover outstanding in trade debts: a firm with an annual turnover of £5m may have a debtor balance of £1m. These large sums create cash difficulties that can pressurize an otherwise healthy business. Factors step in to provide the cash needed to support stock levels, to pay suppliers and generally aid more profitable trading and growth. The factor will give an advanced payment on the security of outstanding invoices. Normally about 80 percent of the invoice value can be made available to a firm immediately (with some factors this can be as much as 90 percent). The remaining 20 percent is transferred from the factor when the customer finally pays up. Naturally the factor will charge a fee and interest on the money advanced. The cost will vary between clients depending on sales volume, the type of industry and the average value of the invoices. According to HSBC the charge for finance is comparable with overdraft rates (2–3 per cent over base rate). As on an overdraft the interest is calculated on the daily outstanding balance of the funds that the borrowing firm has transferred to their business account. Added to this is a service charge that varies between 0.2 and 3 percent of invoiced sales. This is set at the higher end if there are many small invoices or a lot of customer accounts or the risk is high. Figure 15.5 shows the stages in a typical factoring transaction. First, goods are delivered to the customer and an invoice is sent. Secondly, the supplier sells the right to receive the invoice amount to a factor in return for, say, 80 percent of the face value now. Thirdly, some weeks later the customer pays the sum owing, which goes to the factor and finally, the factor releases the remaining 20 percent to the supplier less interest and fees.

**FIGURE 15.5**  
Stages in a factoring deal





Factors frequently reject clients as unsuitable for their services. The factor looks for 'clean and unencumbered debts' so that it can be reasonably certain of receiving invoice payments. It will also want to understand the company's business and to be satisfied with the competence of its management. Figure 15.6 shows how a factor might calculate the amount to be advanced.

This form of finance has some advantages over bank borrowing. The factor does not impose financial ratio covenants (e.g. profits as a multiple of interest) or require fixed asset backing. Also the fear of instant withdrawal of a facility (as with an overdraft) is absent as there is usually a notice period. The disadvantages are the raised cost and the unavailability of factoring to companies with many small-value transactions.

### Sales ledger administration

Companies, particularly young and fast-growing ones, often do not want the trouble and expense of setting up a sophisticated system for dealing with the collection of outstanding debts. For a fee (0.5–2.5 percent of turnover) factors will take over the functions of recording credit sales, checking customers' creditworthiness, sending invoices, chasing late payers and ensuring that debts are paid. The fees might seem high, say £100,000 for a firm with a turnover of £5m, but the company avoids the in-house costs of an administrative team and can concentrate attention on the core business. Moreover, factors are experienced professional payment chasers who know all the tricks of the trade (such as 'the check is in the post' excuse) and so can obtain payment earlier. With factoring sales ledger administration and debt collection generally come as part of the package offered by the finance house, unlike with invoice discounting (*see* below).

**FIGURE 15.6**

#### Amount available from a factor

A supplying firm has £1m of outstanding invoices, £40,000 are so old that the factor will not consider them, £60,000 are rejected as poor quality or are export sales and £30,000 are subject to a dispute between the supplier and the customer. The factor is prepared to advance 80% of suitable invoices:

Total invoices		£1,000,000
Less:		
Debts excessively old	£40,000	
Non-approved	£60,000	
In dispute	£30,000	
		<u>(130,000)</u>
		<u>£870,000</u>

The amount the factor is willing to provide to the supplier immediately is 80% of £870,000, or £696,000 (69.6% of total invoices).

## Credit insurance

The third service available from a factor is the provision of insurance against the possibility that a customer does not pay the amount owed. The charge for this service is generally between 0.3 and 0.5 percent of the value of the invoices.

## Recourse and non-recourse

Most factoring arrangements are made on a non-recourse basis, which means that the factor accepts the risk of non-payment by the customer firm. For accepting this risk the factor will not only require a higher return but also want control over credit assessment, credit approval and other aspects of managing the sales ledger to ensure payment. Some firms prefer recourse factoring in which they retain the risk of customer default but also continue to maintain the relationship with their customers through the debt collection function without the sometimes overbearing intervention of the factor. With confidential invoice factoring the customer is usually unaware that a factor is the ultimate recipient of the money paid over, as the supplier continues to collect debts, acting as an agent for the factor.

## Invoice discounting

With invoice discounting, invoices are pledged to the finance house in return for an immediate payment of up to 90 percent of the face value. The supplying company guarantees to pay the amount represented on the invoices and is responsible for collecting the debt. The customers are generally totally unaware that the invoices have been discounted. When the due date is reached it is to be hoped that the customer has paid in full. Regardless of whether the customer has paid, the supplying firm is committed to handing over the total invoice amount to the finance house and in return receives the remaining 10 percent less service fees and interest. Note that even invoice discounting is subject to the specific circumstances of the client agreement and is sometimes made on a non-recourse basis. The key differences between invoice discounting and factoring are that the former is *usually* with recourse to the supplying company and collection from the customer is made by the supplying company. If your company needs the services of sales ledger administration and collection then factoring is for you.

The finance provider usually only advances money under invoice discounting if the supplier's business is well established and profitable. There must be an effective and professional credit control and sales ledger administration system in the supplying firm and turnover must be at least £250,000. Charges are usually lower than for factoring because the sales ledger administration is the responsibility of the supplying company. Fees are 0.2 to 0.8 percent of company sales plus interest comparable with business overdraft rates.

Exhibit 15.4 illustrates the importance of factoring to a packaging company.

## Vital factor in surviving a slump

Ferga Byrne

In 1991, as recession took hold, Jitu Shukla, managing director of Shukla Packaging, reached the end of his tether. For months, he had struggled to get customers to pay outstanding invoices. That and a change in the production base of the Watford-based wrapping paper and accessories company, requiring 50 per cent advance payment on international production, meant cashflow was becoming critical.

'I was spending all my time chasing debtors [across England] and I was increasingly stressed,' says Mr Shukla. 'Customers were delaying their payments by 15–20 days on average and we were heading for a cashflow crisis.'

His experience is not unusual. In an economic downturn companies can see their payment terms extended by 10–15 days, to potentially disastrous effect, says Phillip Mellor, senior analyst at D&B, the business information group. Mr Mellor says that for many smaller businesses, debtor payment after 70 days can wipe out the profit margin.

With his bank manager increasingly nervous about the size of the company's overdraft, Mr Shukla opted for full-service factoring plus credit insurance from Lombard, now part of Royal Bank of Scotland Commercial Services. He worried about how his customers might react but it was a risk worth taking because otherwise the business might fail.

While factoring was relatively rare in the UK then, today some 30,000 companies use it in some form. 'Factoring is a powerful way for companies to make their assets work harder,' says Andrew Pepper, a partner at accountancy firm BDO Stoy Hayward. 'Factors generally advance some 80–90 per cent of a company's debtor ledger compared to a figure of, say, 50 per cent for overdrafts. Factoring is particularly useful for a

growing company as the size facility increases as your turnover does.'

For Mr Shukla, the decision to factor receivables was crucial. '[It] transformed the liquidity position of the company. And it has allowed me to focus my attention where it mattered – building relationships with our customers, vital during a turndown, and on new product development.'

Factoring is not suitable for every business. It is unlikely to be offered in sectors such as construction and engineering, where payments are made over extended periods.

Factoring is usually more suitable for companies suffering an adverse cash cycle rather than dealing with bad payers – Shukla Packaging suffered both. Unless a company chooses credit insurance – less than 10 per cent do – factoring cannot eliminate bad debts. It may, in some cases, exacerbate the underlying problem, says John Anglin, a business adviser working at Entrust, a local enterprise agency in the north-east of England. 'I have seen companies in serious financial trouble when they have had to pay advances back to the factors – money that had already been spent – when a customer defaulted,' he says.

For Mr Shukla, taking out credit insurance with the factoring saved his business when greetings card company Athena collapsed less than a year later, accounting for almost 40 per cent of his receivables.

Shukla's customers tend to pay the factors quicker than they paid Shukla Packaging but this is not always the case. Mike Savich, managing director of steel company Magnemag, found his customers were paying the factoring company later than when he ran his own debtors ledger. This has been a growth constraint as Magnemag was unable to factor new invoices until outstanding invoices were paid.

The cost of the credit management and bill collection service performed by Royal Bank of Scotland Commercial Services has varied between 1–2 per cent of total invoices, which Mr Shukla says 'is a fraction of the cost of hiring a sales ledger clerk and a credit controller to chase debts throughout the UK, not to mention the possible legal costs'.

The interest rate on the company's factoring advances is lower than the rate on its overdraft, which Mr Shukla attributes to the factoring company's better understanding of the underlying business, helping it make a more accurate

risk assessment than the bank. But some companies have seen their working capital position deteriorate when the bank has reduced the overdraft facility dramatically, says Eddy Weatherall, of the Independent Banking Advisory Service.

Both the decision to factor and the choice of factoring company need careful consideration. Mr Savich says his factoring contract was long, with lots of legal detail. 'Many companies simply do not have the expertise or the time to fully access the nature of the deal,' says Mr Savich. 'And it can be difficult to unwind later.'

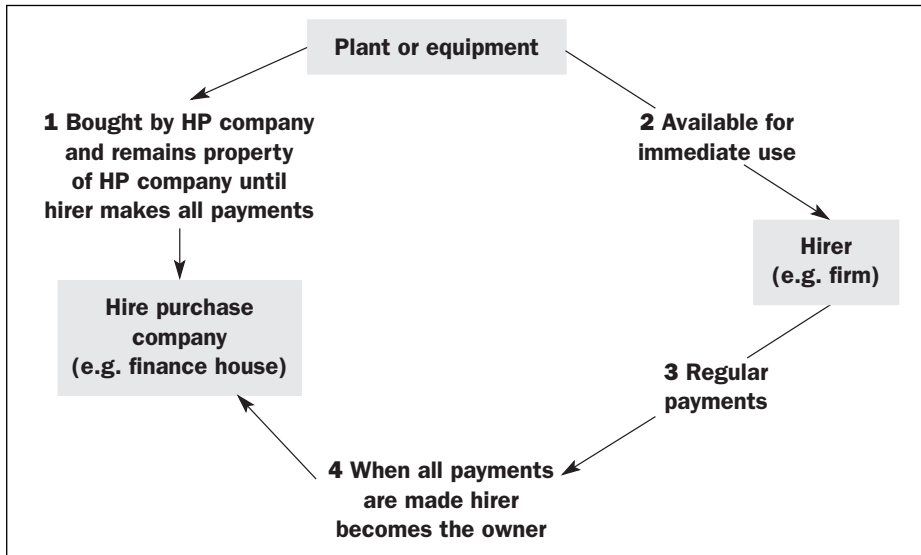
#### EXHIBIT 15.4 Vital factor in surviving a slump

Source: *Financial Times* 24 January 2002

### Hire purchase

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With hire purchase the finance company buys the equipment that the borrowing firm needs. The equipment (plant, machinery, vehicles, etc.) belongs to the hire purchase (HP) company. However the finance house allows the 'hirer' firm to use the equipment in return for a series of regular payments. These payments are sufficient to cover interest and contribute to paying off the principal. While the monthly instalments are still being made the HP company has the satisfaction and security of being the legal owner and so can take repossession if the hirer defaults on the payments. After all payments have been made the hirer becomes the owner, either automatically or on payment of a modest option-to-purchase fee. Nowadays, consumers buying electrical goods or vehicles have become familiar with the attempts of sales assistants to also sell an HP agreement so that the customer pays over an extended period. Sometimes the finance is provided by the same organization, but more often by a separate finance house. The stages in an HP agreement are as in Figure 15.7, where the HP company buys the durable good which is made available to the hirer firm for immediate use. A series of regular payments follows until the hirer owns the goods.

**FIGURE 15.7****The hire purchase sequence**

Some examples of assets that may be acquired on HP are as follows.

- Plant and machinery
- Business cars
- Commercial vehicles
- Agricultural equipment
- Hotel equipment
- Medical and dental equipment
- Computers, including software
- Office equipment

There are clearly some significant advantages of this form of finance, given the fact that over £7bn of new agreements are arranged each year for UK businesses alone. The main advantages are as follows.

- 1 *Small initial outlay* The firm does not have to find the full purchase price at the outset. A deposit followed by a series of instalments can be less of a cash flow strain. The funds that the company retains by handing over merely a small deposit can be used elsewhere in the business for productive investment. Set against this is the relatively high interest charge and the additional costs of maintenance and insurance.
- 2 *Easy to arrange* Usually at point of sale.
- 3 *Certainty* This is a medium-term source of finance that cannot be withdrawn provided contractual payments are made, unlike an overdraft. On the other hand the commitment is made for a number of years and it could be costly to terminate the agreement.
- 4 *HP is often available when other sources of finance are not* For some firms the equity markets are unavailable and banks will no longer lend to

them, but HP companies will still provide funds as they have the security of the asset to reassure them.

- 5 *Fixed-rate finance* In most cases the payments are fixed throughout the HP period. While the interest charged will not vary with the general interest rate throughout the life of the agreement the hirer has to be aware that the HP company will quote an interest rate which is significantly different from the true annual percentage rate. The HP company tends to quote the flat rate. So, for example, on a £9,000 loan repayable in equal instalments over 30 months the flat rate might be 12.4 percent. This is calculated by taking the total interest charged over the two and a half years and dividing by the original £9,000. The monthly payments are £401.85 and therefore the total paid over the period is  $£401.85 \times 30 = £12,055.50$ . The flat interest is:

$${}^{2.5}\sqrt{(12,055.50/9,000)} - 1 = 0.1240 \text{ or } 12.4\%$$

This would be the true annual rate if the entire interest and capital were repaid at the end of the 30th month. However, a portion of the capital and interest is repaid each month and therefore the annual percentage rate (APR) is much higher than the flat rate. As a rough rule of thumb the APR is about double the flat rate.

6 *Tax relief* The hirer qualifies for tax relief in two ways:

- The asset can be subject to a writing-down allowance (WDA) on the capital expenditure. For example, if the type of asset is eligible for a 25 percent WDA and originally cost £10,000 the using firm can reduce its taxable profits by £2,500 in the year of purchase; in the second year taxable profits will be lowered by  $£7,500 \times 0.25 = £1,875$ . If tax is levied at 30 percent on taxable profit the tax bill is reduced by  $£2,500 \times 0.30 = £750$  in the first year, and  $£1,875 \times 0.3 = £562.50$  in the second year. Note that this relief is available despite the hirer company not being the legal owner of the asset.
- Interest payments are deductible when calculating taxable profits.

The tax reliefs are valuable only to profitable companies. Many companies do not make sufficient profit for the WDA to be worth having. This can make HP an expensive form of finance. An alternative form of finance, which circumvents this problem (as well as having other advantages) is leasing.

## Leasing

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Leasing is similar to HP in that an equipment owner (the lessor) conveys the right to use the equipment in return for regular rental payments by the equipment user (the lessee) over an agreed period of time. The essential difference is that the lessee never becomes the owner – the leasing company retains legal title. Subsidiaries of clearing banks dominate the UK leasing market, but the world's biggest leasing companies are Ford, GE Capital and GMAC (owned by General Motors).

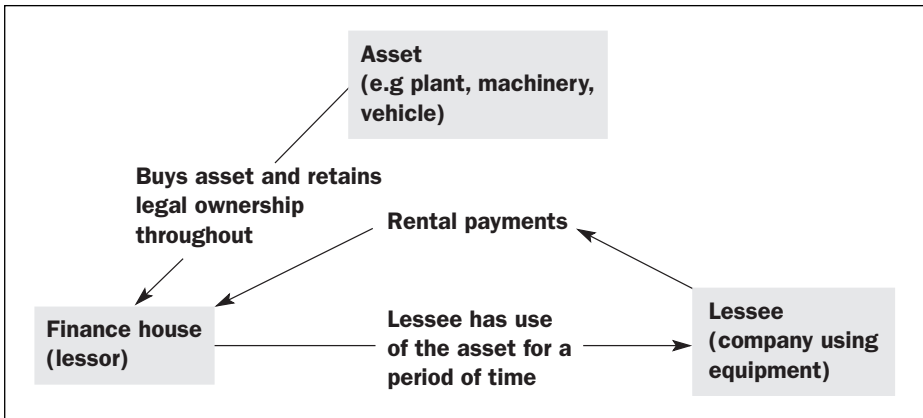
Leasing, together with hire purchase, accounts for approximately one-quarter of all fixed capital investment by UK firms – rising to 50 percent for small firms. Figure 15.8 shows that a typical lease transaction involves a firm wanting to make use of an asset approaching a finance house which purchases the asset and rents it to the lessee.

It is important to distinguish between operating leases and finance leases.

### Operating lease

Operating leases commit the lessee to only a short-term contract or one that can be terminated at short notice. These are certainly not expected to last for the entire useful life of the asset and so the finance house has the responsibility of finding an alternative use for the asset when the lessee no longer requires it. Perhaps the asset will be sold in the secondhand market, or it might be leased to another client. Either way the finance house bears the risk of ownership. If the equipment turns out to have become obsolete more quickly than was originally anticipated it is the lessor that loses out. If the equipment is less reliable than expected the owner (the finance house) will have to pay for repairs. Usually, with an operating lease, the lessor retains the obligation for repairs, maintenance and insurance. It is clear why equipment which is subject to rapid obsolescence and frequent breakdown is often leased out on an operating lease. Photocopiers, for example, used by a university department are far better leased; so, if they break down the university staff do not have to deal with the problem. In addition the latest model can be quickly installed in the place of an outdated one. The same logic applies to computers, facsimile machines and so on.

**FIGURE 15.8**  
**A leasing transaction**



Operating leases are also useful if the business involves a short-term project requiring the use of an asset for a limited period. For example construction companies often use equipment supplied under an operating lease (sometimes called plant hire). Operating leases are not confined to small items of equipment. There is a growing market in leasing aircraft and ships for periods less than the economic life of the asset, thus making these deals operating leases. Many of Boeing's aircraft go to leasing firms.

### **Finance lease**

Under a finance lease (also called a capital lease or a full payout lease) the finance provider expects to recover the full cost (or almost the full cost) of the equipment, plus interest, over the period of the lease. With this type of lease the lessee usually has no right of cancellation or termination. Despite the absence of legal ownership the lessee will have to bear the risks and rewards that normally go with ownership: the lessee will usually be responsible for maintenance, insurance and repairs and suffer the frustrations of demand being below expectations or the equipment becoming obsolete more rapidly than anticipated. Most finance leases contain a primary and a secondary period. It is during the primary period that the lessor receives the capital sum plus interest. In the secondary period the lessee pays a very small 'nominal', rental payment. Even the armed forces have turned to leasing as a method of funding: in 2001 the Ministry of Defence signed a ten-year deal worth £500m involving 8,500 vehicles being leased from Lex Vehicle Leasing.

### **Advantages**

The advantages listed for hire purchase also apply to leasing: small initial outlay, certainty, available when other finance sources are not, fixed-rate finance and tax relief. There is an additional advantage of operating leases and that is the transfer of obsolescence risk to the finance provider.

The tax advantages for leasing are slightly different from those for HP. The rentals paid on an operating lease are regarded as tax deductible and so this is relatively straightforward. For financial leases, however, the tax treatment is linked to the modern accounting treatment following SSAP 21. This was introduced to prevent some creative accounting which under the old system allowed a company to appear to be in a better gearing (debt/equity ratio) position if it leased rather than purchased its equipment. Prior to SSAP 21 a company could lower its apparent gearing ratio and therefore improve its chances of obtaining more borrowed funds by leasing. Take the two companies X and Y, which have identical balance sheets initially, as shown in Figure 15.9.



**FIGURE 15.9****Balance sheets of companies X and Y**

<i>Initial balance sheet for both X and Y</i>		
Shareholders' funds (net assets)		£1,000,000
Debt capital		<u>£1,000,000</u>
Total assets		<u>£2,000,000</u>
Now, if X borrows a further £1m to buy equipment, while Y leases £1m of equipment the balance sheets appear strikingly different under the old accounting rules.		
	Company X	Company Y
Shareholders' funds (net assets)	1,000,000	1,000,000
Debt capital	<u>2,000,000</u>	<u>1,000,000</u>
Total assets	<u>3,000,000</u>	<u>2,000,000</u>

Company X has a debt/equity ratio of 66.67 percent whereas Y has obtained the use of the asset 'off-balance sheet' and so has an apparent gearing ratio of only 50 percent. A superficial analysis of these two firms by, say, a bank lender, may lead to the conclusion that Y is more capable of taking on more debt. In reality Y has a high level of fixed cash outflow commitments stretching over a number of years under the lease and is in effect highly geared. Under these rules Y could also show a higher profit to asset ratio.

Today finance leases have to be 'capitalized' to bring them on to the balance sheet. The asset is stated in the balance sheet and the obligations under the lease agreement are stated as a liability. Over subsequent years the asset is depreciated and, as the capital repayments are made to the lessor the liability is reduced. The profit and loss account is also affected: the depreciation and interest are both deducted as expenses.

The tax authorities apply similar rules and separate the cost of interest on the asset from the capital cost. The interest rate implicit in the lease contract is tax deductible in the relevant year. The capital cost for each year is calculated by allocating rates of depreciation (capital allowances) to each year of useful life.

These new rules apply only to finance leases and not to operating leases. A finance lease is defined (usually) as one in which the present value of the lease payments is at least 90 percent of the asset's fair value (usually its cash price). This has led to some bright sparks engineering leasing deals which could be categorized as operating leases and therefore kept off balance sheets – some are designed so that 89 percent of the value is paid by the lessee. However the authorities are fighting back as Exhibit 15.5 shows. This discusses the impact of bringing operating lease liabilities on to the balance sheet for property companies. However, the proposed accounting changes will apply to all companies.

## Tightening the lease

Doug Cameron

The fall-out from Enron has focused investor and regulatory attention on the role and treatment of special purpose vehicles, the financing entities that ultimately sank the US energy trader.

The preoccupation with these entities has masked slow progress in developing new treatments for the most common off-balance-sheet vehicle: leasing.

There remains widespread discontent among accounting bodies about international disparities in the treatment of leases, covering equipment such as aircraft and computers and fixed assets such as property.

The main global standard-setters – including those in the UK, the US and the International Accounting Standards Board (IASB) – currently distinguish between finance leases and operating leases and require a radically different accounting treatment for each.

In simple terms, finance leases are carried on the corporate balance sheet and operating leases are not.

The classification of the lease affects a range of performance and reporting measures: debt levels, gearing, return on assets employed and interest cover, as well as reported profits.

Minor differences in a leasing contract can also result in one transaction being claimed as a finance lease and another as an operating lease, transforming the accounting treatment of financing structures that are virtually identical.

The ISAB's treatment of leases is enshrined in IAS17, a standard last revised in 1997. In common with other standard-setters, it defines a finance lease as one in which most of the risks and rewards of ownership are transferred to the lessee over the course of

the lease. All other leases are defined as operating leases.

Proposals announced in December 1999 by the UK Accounting Standards Board (ASB) – and distributed internationally to members of the G4+1 group of industrialised nations – promised a radical review of the way in which leases are reported.

The most fundamental change would be to end the differential accounting treatment of finance and operating leases, with the latter no longer treated as an off-balance-sheet item.

The effect would be to transfer billions of dollars of assets on to corporate balance sheets.

The proposals received a mixed reception. There was support for the concept of treating leases on an equitable basis to improve transparency – but concern over how this would transform, and perhaps choke off, some of the basic financing options open to companies.

... The financial flexibility offered by operating leases is ingrained in the financial planning of many corporate sectors, which are unlikely simply to roll over and accept their disappearance.

For example, operating leases have been the fastest-growing source of funding for the airline industry, with almost a quarter of the global commercial fleet now rented by carriers from lessors such as Gecas, a unit of GE Capital, and ILFC, part of American International Group, the world's largest listed insurer.

In the UK, land and buildings account for about 80 per cent of operating leases and a study of 200 UK companies that found that the total value of operating leases was equivalent to 39 per cent of the long-term debt displayed on their balance sheets.

### EXHIBIT 15.5 Tightening the lease

Source: *Financial Times* 30 May 2002

A very important tax advantage can accrue to some companies through leasing because of the legal position of the asset not belonging to the lessee. Companies that happen to have sufficient profits can buy assets and then reduce their taxable profits by writing off a proportion of the assets' value (say 25 per cent on a reducing balance) against income each year. However companies with low profits or those which make a loss are unable to fully exploit these investment allowances and the tax benefit can be wasted. But if the equipment is bought by a finance company with plenty of profits, the asset cost can be used to save on the lessor's tax. This benefit can then be passed on to the customer (the lessee) in the form of lower rental charges. This may be particularly useful to start-up companies and it has also proved of great value to low- or no-profit privatized companies. For example, the railway operating companies often make losses and have to be subsidized by the government. They can obtain the services of rolling stock (trains, etc.) more cheaply by leasing from a profit-generating train-leasing company than by buying. Another advantage is that the leasing agreement can be designed to allow for the handing back of the vehicles should the operating license expire or be withdrawn (as the train-operating licenses are – after seven years or so).

Exhibit 15.6 (Big ticket leasing) and Exhibit 15.7 (IFC) demonstrate the extent to which the availability of lease finance influences big business, at the macro end of the scale, and the working lives of millions of people even in the poorest countries on earth, on the micro scale, where it is seen as playing an important role in lifting people out of poverty.

### **Big ticket leasing accounts for a third of the funds provided through leasing**

Leasing is sometimes used for very large assets – often in excess of £100m – which range from entire production lines and ships to shopping centers and accommodation for university students. For example in the early 1990s NatWest Markets put together a £290m leasing facility for Humber Power for gas and electrical plant and machinery. Another example is Airstream Finances, which leases 200 commercial aircraft on six continents. In 2001 Airbus sold 111 aircraft to International Lease Finance Corporation worth \$8.7bn, which will then lease the planes to airlines around the world.

**Exhibit 15.6** Big ticket leasing

## IFC extends leasing aid to Vietnam

Nancy Dunne

The International Finance Corporation, the private sector arm of the World Bank, has announced its first foray in Vietnam's financial sector – the establishment of a leasing company to enable small and medium-sized companies to procure capital goods.

On the surface the \$15m loan and \$750,000 equity investment looks modest. However, the corporation has been promoting leasing as one of the quickest, cheapest and most flexible ways of supporting business in emerging economies, where businesses desperately need machinery, office and plant equipment.

The IFC is planning to sign a joint venture deal on November 12 to set up the first leasing company in Egypt.

The new Vietnamese company, Vietnam International Leasing Company (VILC), is expected to write leases of \$25,000–\$30,000 for smaller or micro enterprises and \$100,000–\$150,000 for medium-sized companies. IFC says VILC will have 'a strong impact on Vietnam's financial sector by extending and improving credit delivery and introducing new financial products to the local market to encourage capital formation and investment' ...

IFC has been working closely with governments, advising them on leasing regulations, recruiting sponsors and technical partners and investing in new leasing companies.

An IFC paper, issued in August, said one-eighth of the world's private investment was financed through leasing. Its share is soaring; in some countries it provides as much as one-third of the private investment.

IFC has helped set up leasing companies in over half of the developing countries. In August it provided \$5.6m in financing to help establish Uzbek Leasing International, the first specialised leasing company in Uzbekistan.

The corporation also helps leasing companies, in which it has equity, to expand. Last March it guaranteed a local currency loan of \$3m equivalent for the Industrial Development Leasing Company of Bangladesh, established in 1986.

IFC's involvement allows the company to borrow locally for a longer period than otherwise would be possible.

IFC's first leasing venture was in 1977 in Korea. The Korea Development Leasing Corporation is now the world's fifth largest leasing industry.

### EXHIBIT 15.7 IFC extends leasing aid to Vietnam

Source: *Financial Times* 1 November 1996

## Bills of exchange

A bill is a document that sets out a commitment to pay a sum of money at a specified point in time. The simplest example is an ordinary bank check that has been dated two weeks hence. The government borrows by selling Treasury bills which commit it to paying a fixed sum in, say, three months. Local authorities issue similar debt instruments, as do commercial organizations in the form of commercial bills (*see* Chapter 16).

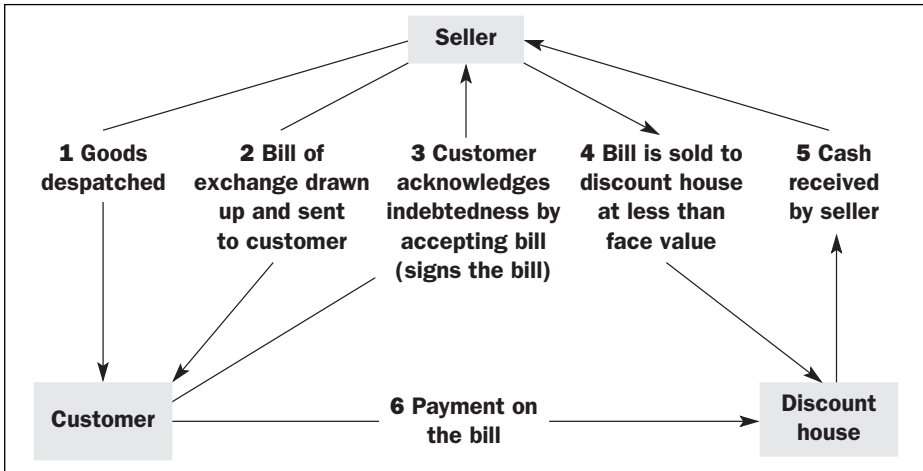
Bills of exchange are mainly used to oil the wheels of overseas trade. They have a long history helping to promote international trade, particularly in the nineteenth and twentieth centuries. The seller of goods to be transported to a buyer in another country frequently grants the customer a number of months in which to pay. The seller will draw up a bill of exchange – that is, a legal document is produced showing the indebtedness of the buyer. The bill of exchange is then forwarded to, and accepted by the customer, which means that the customer signs a promise to pay the stated amount and currency on the due date. The due date is usually 90 days later but 30, 60 or 180 days bills of exchange are not uncommon. The bill is returned to the seller who then has two choices, either to hold it until maturity and receive payment under it then, or to sell it to a bank or discount house (the bill is discounted). Under the second option the bank will pay a lower amount than the sum to be received in, say, 90 days from the customer. The difference represents the bank’s interest.

For example, if a customer has accepted a bill of exchange that commits it to pay £200,000 in 90 days the bill might be sold by the supplier immediately to a discount house or bank for £194,000. After 90 days the bank will realize a profit of £6,000 on a £194,000 asset, an interest rate of 3.09 percent  $((6,000/194,000) \times 100)$  over 90 days. This gives an approximate annual rate of:

$$(1.0309)^4 - 1 = 0.1296 = 12.96\%$$

Through this arrangement the customer has the benefit of the goods on 90 days credit, the supplier has made a sale and immediately receives cash from the discount house amounting to 97 per cent of the total due. The discounter, if it borrows its funds at less than 12.9 percent, turns in a healthy profit. The sequence of events is shown in Figure 15.10.

**FIGURE 15.10**  
The bill of exchange sequence



Bills of exchange are normally only used for transactions greater than £75,000. The effective interest rate charged by the discounter is a competitive 1.5 to 4 percent over interbank lending rates (for example, LIBOR) depending on the creditworthiness of the seller and the customer. The bank has recourse to both of the commercial companies: if the customer does not pay then the seller will be called upon to make good the debt. This overhanging credit risk can sometimes be dealt with by the selling company obtaining credit insurance. Despite the simplification of Figure 15.10, many bills of exchange do not remain in the hands of the discounter until maturity but are traded in an active secondary market (the money market).

### **Acceptance credits (bank bills or banker's acceptance)**

In the case of acceptance credits (bank bills) the company which is in need of finance requests the drawing up of a document which states that the signatory will pay a sum of money at a set date in the future. This is 'accepted' (signed) by a bank (rather than by a customer). At the same time the company accepts a commitment to pay the accepting bank.

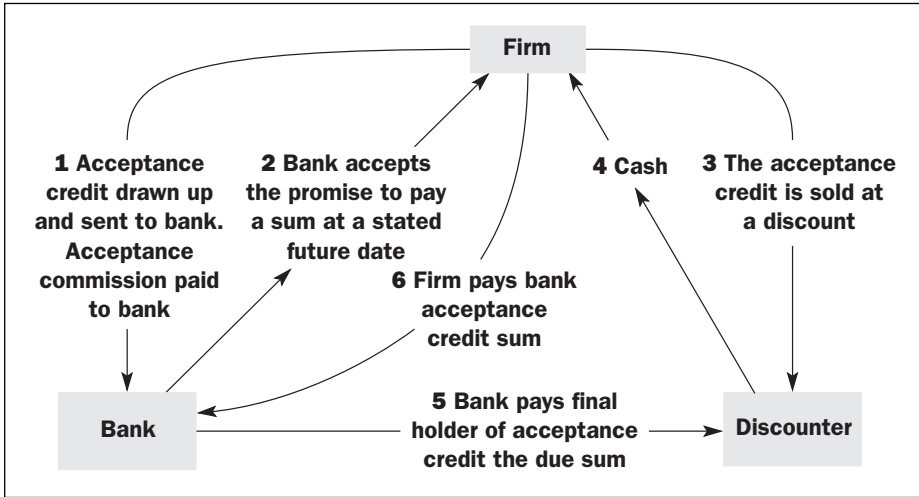
This bank commitment to pay the holder of the acceptance credit can then be sold in the money markets to, say, another bank (a discounter) by the firm to provide for its cash needs. (Alternatively an importing company could give the acceptance credit to its overseas supplier in return for goods – and the supplier can then sell it at a discount if required).

The acceptance credit is similar to a bill of exchange between a seller and a buyer, but now the organization promising to pay is a reputable bank representing a lower credit risk to any subsequent discounter. These instruments therefore normally attract finer discount rates than a trade bill. When the maturity date is reached the company pays the issuing bank the value of the bill, and the bank pays the ultimate holder of the bill its face value.

The company does not have to sell the acceptance credit immediately and so can use this instrument to plug finance gaps at opportune times. There are two costs of bank bill finance.

1. **The bank charges acceptance commission for adding its name to the bill.**
2. **The difference between the discount price and the acceptance credit's due sum.**

These costs are relatively low compared with those on overdrafts and there is an ability to plan ahead because of the longer-term commitment of the bank. Unfortunately this facility is only available in hundreds of thousands of pounds and then only to the most credit-worthy of companies.

**FIGURE 15.11****An acceptance credit sequence**

## Conclusion

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The modern corporation has a rich array of alternative sources of funds available to it. We have considered only short- and medium-term finance in this chapter. The next chapter looks at debt finance available for the long term, mostly finance available to the largest firms with the ability to draw on the financial markets. Chapter 17 describes the various ways of raising share finance for the growing firm.

It is the responsibility of the senior management team to select the most appropriate combination of forms of finance and the proportions of each. Each organization faces different circumstances and so the most appropriate mixture will change from one entity to another. To help make this judgment we have already considered the advantages and disadvantages of bank overdrafts and loans; trade credit; factoring; hire purchase and leasing, and; trade and bank bills. We now go on to broaden the range of possible types to bonds, convertibles, mezzanine finance, Eurobonds, medium-term notes, commercial paper, project finance, sale and leaseback, preference shares and ordinary shares.

## Websites

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[www.bba.org.uk](http://www.bba.org.uk)

British Bankers Association

[www.dti.gov.uk](http://www.dti.gov.uk)

Department of Trade and Industry

[www.fsb.org.uk](http://www.fsb.org.uk)

Federation of Small Businesses

[www.payontime.co.uk](http://www.payontime.co.uk)

Better Payments Practice Group

[www.fla.org.uk](http://www.fla.org.uk)

Finance and Leasing Association

[www.factors.org.uk](http://www.factors.org.uk)

Factors and Discounters Association

## DEBT FINANCE FROM THE FINANCIAL MARKETS

Introduction

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Bonds

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Syndicated loans

---

Credit rating

---

Mezzanine debt and high-yield (junk) bonds

---

Convertible bonds

---

Valuing bonds

---

International sources of debt finance

---

Medium-term notes

---

Commercial paper

---

Project finance

---

Sale and leaseback

---

Securitization

---

Conclusion

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## Introduction

**In the sophisticated capital markets of today with their wide variety of financial instruments and forms of debt, the borrowing decision can be bewildering.**

The concept of borrowing money to invest in real assets within a business is a straightforward one, yet in the sophisticated capital markets of today with their wide variety of financial instruments and forms of debt, the borrowing decision can be bewildering. Should the firm tap the domestic bond market or the Eurobond market? And what about syndicated lending, mezzanine finance and high-yield bonds? The variety of methods of borrowing finance is infinite. This chapter outlines the major categories of debt finance from the financial markets and illustrates some of the fundamental issues a firm may consider when selecting its finance mix. As you can see from the detail taken from the annual accounts of GlaxoSmithKline plc (Figure 16.1) a firm may need knowledge and understanding of a great many different debt instruments. The terms bonds, commercial paper, Eurobond, medium-term notes and loan stock mentioned in the extract are explained in this chapter. In addition we cover convertible bonds, foreign bonds, project finance, securitization and sale and leaseback.

**FIGURE 16.1**  
**Loans and other borrowings for GlaxoSmithKline plc**

	(31 Dec. 2002)	(31 Dec. 2001)
	£m	£m
Loans and overdrafts due within one year:		
Bank loans and overdrafts	(263)	(307)
Commercial paper	(1,284)	(1,269)
Eurobonds and medium-term notes (MTNs)	–	(542)
Obligations under finance leases	(1)	(2)
Other loans	(3)	(4)
Loans due after one year:		
Bank loans	(3)	(11)
Eurobonds, MTNs and private financing	(3,054)	(2,059)
Loan stock	(14)	(16)
Obligations under finance leases	(12)	(12)
Other loans	(9)	(10)

Commercial paper comprises a US\$10bn program, of which £1,284m was in issue at 31 December 2002.

In 2002, a £500m, 4.875% coupon bond and two, US dollar denominated, floating rate bonds totaling \$495m were issued under the European Medium Term Note program. The group also raised \$500m of floating rate debt through a private financing arrangement.

## Bonds

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A bond is a long-term contract in which the bondholders lend money to a company. In return the company (usually) promises to pay the bond owners a series of interest payments, known as coupons, until the bond matures. At maturity the bondholder receives a specified principal sum called the par, face or nominal value of the bond. This is usually £100 in the UK and \$1,000 in the USA. The time to maturity is generally between seven and 30 years although a number of firms, for example Disney, IBM and Reliance of India, have issued 100-year bonds.

Bonds may be regarded as merely IOUs (I owe you) with pages of legal clauses expressing the promises made. Some corporate bonds are sufficiently liquid (many transactions, so selling without moving the price is possible) to trade on the London Stock Exchange, but the vast majority of trading occurs in the over-the-counter (OTC) market directly between an investor and a bond dealer. Thus, the investor who originally provided the firm with money does not have to hold on to the bond until the maturity date (the redemption date). The amount the investor receives in the secondary market might be more or less than what he/she paid. For instance, imagine an investor paid £99.80 for a bond that promised to pay a coupon of 9 percent per year on a par value of £100 and to pay the par value in seven years. If one year after issue interest rates on similar bonds are 20 percent per annum no one will pay £99.80 for a bond agreement offering £9 per year for a further six years plus £100 on the redemption date. We will look at a method for calculating exactly how much they might be willing to pay later in the chapter.

**Bonds may be regarded as merely IOUs.**

These negotiable (that is tradeable in a secondary market) instruments come in a variety of forms. The most common is the type described above with regular (usually semi-annual) fixed coupons and a specified redemption date. These are known as straight, plain vanilla or bullet bonds. Other bonds are a variation on this. Some pay coupons every three months, some pay no coupons at all (called zero coupon bonds – these are sold at a large discount to the par value and the investor makes a capital gain by holding the bond), some bonds do not pay a fixed coupon but one which varies depending on the level of short-term interest rates (floating-rate or variable-rate bonds), some have interest rates linked to the rate of inflation. In fact, the potential for variety and innovation is almost infinite. Bonds issued in the last few years have linked the interest rates paid or the principal payments to a wide variety of economic events, such as the price of silver, exchange-rate movements, stock market indices, the price of oil, gold, copper – even to the occurrence of an earthquake. These bonds were generally designed to let companies adjust their interest payments to manageable levels in the event of the firm being adversely affected by some economic variable changing. For example, a copper miner pays lower interest on its finance if the copper price falls. In 1999 Sampdoria, the Italian football club, issued a €3.5m bond that paid a higher rate of return if the club won promotion to the ‘Serie A’ division. If the club rose to the top four in Serie A the coupon would rise to 14 percent.

## Debentures and loan stocks

The most secured type of bond is called a debenture. They are usually secured by either a fixed or a floating charge against the firm's assets. A fixed charge means that specific assets are used as security that, in the event of default, can be sold at the insistence of the debenture bondholder and the proceeds used to repay them. Debentures secured on property may be referred to as mortgage debentures. A floating charge means that the loan is secured by a general charge on all the assets of the corporation. In this case the company has a high degree of freedom to use its assets as it wishes, such as sell them or rent them out, until it commits a default which 'crystallizes' the floating charge. If this happens a receiver will be appointed with powers to dispose of assets and to distribute the proceeds to the creditors. Even though floating-charge debenture holders can force liquidation, fixed-charge debenture holders rank above floating-charge debenture holders in the payout after insolvency.

The terms bond, debenture and loan stock are often used interchangeably and the dividing line between debentures and loan stock is a fuzzy one. As a general rule debentures are secured and loan stock is unsecured but there are examples which do not fit this classification. If liquidation occurs the unsecured loan stockholders rank beneath the debenture holders and some other categories of creditors, such as the tax authorities. In the USA the definitions are somewhat different and this can be confusing. There a debenture is an unsecured bond and so the holders become general creditors who can only claim assets not otherwise pledged. In the USA the secured form of bond is referred to as the mortgage bond and unsecured shorter-dated issues (less than 15 years) are called notes.

## Trust deeds and covenants

Bond investors are willing to lower the interest they demand if they can be reassured that their money will not be exposed to a high risk. This reassurance is conveyed by placing risk-reducing restrictions on the firm. A trust deed sets out the terms of the contract between bondholders and the company. The trustees ensure compliance with the contract throughout the life of the bond and have the power to appoint a receiver. The loan agreement will contain a number of affirmative covenants. These usually include the requirements to supply regular financial statements, interest and principal payments. The deed may also state the fees due to the lenders and details of what procedures are to be followed in the event of a technical default, for example non-payment of interest.

In addition to these basic covenants are the negative covenants. These restrict the actions and the rights of the borrower until the debt has been repaid in full. Some examples are as follows.

- *Limits on further debt issuance* If lenders provide finance to a firm they do so on certain assumptions concerning the riskiness of the capital structure. They will want to ensure that the loan does not become more risky due

to the firm taking on a much greater debt burden relative to its equity base, so they limit the amount and type of further debt issues – particularly debt which is higher (superior) ranking for interest payments and for a liquidation payment. Subordinated debt – with low ranking on liquidation – is more likely to be acceptable.

- *Dividend level* Lenders are opposed to money being taken into the firm by borrowing at one end, while being taken away by shareholders at the other. An excessive withdrawal of shareholder funds may unbalance the financial structure and weaken future cash flows.
- *Limits on the disposal of assets* The retention of certain assets, for example property and land, may be essential to reduce the lenders' risk.
- *Financial ratios* A typical covenant here concerns the interest cover, for example: 'The annual pre-interest pre-tax profit will remain four times as great as the overall annual interest charge'. Other restrictions might be placed on working capital ratio levels, and the debt to net assets ratio. In the case of Photobition the interest cover threshold is 3.25 – see Exhibit 16.1.

While negative covenants cannot provide completely risk-free lending they can influence the behavior of the management team so as to reduce the risk of default. The lenders' risk can be further reduced by obtaining guarantees from third parties (for example, guaranteed loan stock). The guarantor is typically the parent company of the issuer.

Despite a raft of safeguards the fact that bondholders are still exposed to some degree of risk was brought home painfully to the bondholders in Barings Bank in 1996. They had lent £100m on the understanding that the money would be used for standard merchant banking activities. When they lost their entire investment due to the extraordinary activities of Nick Leeson in the derivatives

## Photobition cautions on covenants

Florian Gimbel

Photobition, the Surrey-based graphics business, admitted yesterday it could breach banking covenants over the level of its interest cover if US advertising spending continued to slow down.

The company, which also reported a sharp fall in half-year profits, said net debt has risen to £103.5m (£77.3m) after a number of US acquisitions ...

Analysts forecast that cover might fall to 2.43 times at the year-end in June, below the required minimum of 3.25.

'If they breach the bank covenants, they will be at the mercy of debt holders,' said one analyst. 'They could have to renegotiate their debt, or make some form of debt-equity conversion. They might also resort to a rights issue.'

### EXHIBIT 16.1 Photobition cautions on covenants

Source: *Financial Times* 28 February 2001

markets (see Chapter 20) their response was to issue writs for compensation from three stockbrokers and a dozen former Barings directors, claiming that misleading information was given about Barings' business when the bond issue was launched in January 1994.

## Repayments

The principal on many bonds is paid entirely at maturity. However, there are bonds which can be repaid before the final redemption date. One way of paying for redemption is to set up a sinking fund that receives regular sums from the firm that will be sufficient, with added interest, to redeem the bonds. A common approach is for the company to issue bonds where it has a range of dates for redemption; so a bond dated 2008–2012 would allow a company the flexibility to repay a part of the principal in cash in each of the four years. Another way of redeeming bonds is for the issuing firm to buy the outstanding bonds by offering the holder a sum higher than or equal to the amount originally paid. A firm is also able to purchase bonds on the open market.

Some bonds are described as 'irredeemable' as they have no fixed redemption date. From the investor's viewpoint they may be irredeemable but the firm has the option of repurchase and can effectively redeem the bonds.

## Bond variations

Bonds which are sold at well below the par value are called deep discounted bonds, the most extreme form of which is the zero coupon bond. It is easy to calculate the rate of return offered to an investor on this type of bond. For example, if a company issues a bond at a price of £60 which is redeemable at £100 in eight years the annualized rate of return ( $r$ ) is:

$$60(1 + r)^8 = 100$$

$$r = \sqrt[8]{\frac{100}{60}} - 1 = 0.066 \text{ or } 6.6\%$$

(Mathematical tools of this kind are explained in the appendix to Chapter 2.)

These bonds are particularly useful for firms with low cash flows in the near term, for example firms engaged in a major property development that will not mature for many years.

A major market has developed recently called the floating rate note (FRN) market (also called the variable-rate note market). Two factors have led to the rapid growth in FRN usage. First, the oscillating and unpredictable inflation of the 1970s and early 1980s caused many investors to make large real-term losses on fixed-rate bonds as the interest rate fell below the inflation rate. As a result many lenders became reluctant to lend at fixed rates on a long-term basis. Secondly, a number of corporations, especially financial institutions, hold assets which give a

return that varies with the short-term interest rate level (for example bank loans and overdrafts) and so prefer to hold a similar floating-rate liability. These instruments pay an interest that is linked to a benchmark rate – such as the LIBOR (London Inter-Bank Offered Rate – the rate that safest banks charge each other for borrowed funds). The issuer will pay, say, 70 basis points (0.7 of a percentage point) over LIBOR. The coupon is set for (say) the first six months at the time of issue, after which it is adjusted every six months; so if six-month LIBOR is 10 percent, the FRN would pay 10.7 percent for that particular six months.

There are many other variations on the basic vanilla bond, two of which will be examined later – high-yield bonds and convertible bonds. We now turn to another major source of long-term debt capital – syndicated bank borrowing.

## Syndicated loans

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For large loans a single bank may not be able or willing to lend the whole amount. To do so would be to expose the bank to an unacceptable risk of failure on the part of one of its borrowers. Bankers like to spread their lending to gain the risk-reducing benefits of diversification. They prefer to participate in a number of syndicated loans in which a few banks each contribute a portion of the overall loan. So, for a large multinational company loan of, say, £500m, a single bank may provide £30m, with perhaps 100 other banks contributing the remainder. The bank originating the loan will usually manage the syndicate and is called the lead manager (there might be one or more lead banks). This bank (or these banks) may invite a handful of other banks to co-manage the loan who then persuade other banks to supply much of the funding. That is, they help the process of forming the syndicate group of banks in the general syndication – the process of getting other banks to agree to lend – these other banks are called participating banks. The managing banks also underwrite much of the loan – guaranteeing to provide the funds if other banks do not step forward.

Syndicated loans are available at short notice and can be provided discreetly (helpful if the money is to finance a merger bid, for example). They generally offer lenders lower returns than bonds, but as they rank above most bonds on liquidation payouts there is less risk. The loans carry covenants similar to those on bond agreements. The volume of new international syndicated loans now runs into hundreds of billions of pounds per year.

Pearson needed \$6bn of bank loans to finance its purchase of Simon & Schuster in 1998; this is far too much for any one bank to provide. So Goldman Sachs and HSBC put together a syndicated loan package involving a number of banks – *see* Exhibit 16.2. A revolving credit facility gives Pearson the right to draw down short-term loans up to a maximum of \$2bn as and when the need arises – this it can do at a number of points over a five-year period. Note that the loans are expected to be tradeable (bought and sold) in a secondary market so banks can sell off some of their loans if they wish to.

## Pearson signs up facility to finance US acquisition

Simon Davies

Pearson, the UK media group which owns the *Financial Times*, has signed up \$6bn of bank facilities to finance its acquisition of Simon & Schuster, the US publisher, and refinance outstanding syndicated loans. It is the latest in a line of substantial acquisitions to be financed through the syndicated loan market, following Texas Utilities' recent \$11bn loan to fund its purchase of The Energy Group and jumbo loans from Imperial Chemical Industries and BAT Industries.

The new financing package has been put together by Goldman Sachs and HSBC and includes a \$2.5bn five-year term loan, a \$2bn five-year revolving credit and a \$1.5bn 364-day loan. Investors expect the loans to be trade-

able. This has become commonplace in the US but was only introduced to the euroloan market last year with the \$8.5bn loan to ICI to finance its acquisition of Unilever's speciality chemicals business.

There has been considerable reluctance by European corporates to have bankers trading out of loans. The *quid pro quo*, in theory, is more attractive financing. Details of the terms of the loan were not available yesterday. A broader underwriting group will be put together in the next 10 days.

Pearson's credit rating from Standard & Poor's, the rating agency, has been put on negative outlook as a result of the acquisition, but its shares rose sharply yesterday.

### EXHIBIT 16.2 Pearson signs up facility to finance US acquisition

Source: *Financial Times* 19 May 1998

## Credit rating

Firms often pay to have their bonds rated by specialist credit-rating organizations. The debt rating depends on the likelihood of payments of interest and/or capital not being paid (that is, default) and on the extent to which the lender is protected in the event of a default by the loan contract (the recoverability of the debt). UK government gilts have an insignificant risk of default whereas unsecured subordinated corporate loan stock has a much higher risk. We would expect that firms in stable industries and with conservative accounting and financing policies and a risk-averse business strategy would have a low risk of default and therefore a high credit rating. Companies with a high total debt burden, a poor cash flow position, in a worsening market environment causing lower and more volatile earnings, will have a high default risk and a low credit rating. The dominant credit rating agencies are Moody's, Standard & Poor's (S&P), with Fitch and Dominion in third and fourth places.

The highest rating is AAA or Aaa (triple-A rated). Such a rating indicates very high quality. The capacity to repay interest and principal is extremely strong. Single A indicates a strong capacity to pay interest and capital but there is some degree of susceptibility to impairment as economic events unfold. BBB or Baa indicates adequate debt service capacity but vulnerability to adverse economic

conditions or changing circumstances. B and C rated debt has predominantly speculative characteristics. The lowest is D, which indicates the firm is in default or is very likely to default.

Ratings of BBB– (or Baa3 for Moody's) or above are regarded as 'investment grade' – this is important because many institutional investors are permitted to invest in investment grade bonds only (*see* Figure 16.2). Bonds rated below this are called high-yield (or junk) bonds. The specific loan is rated rather than the borrower. If the loan does not have a rating it could be that the borrower has not paid for one, rather than implying anything sinister.

The rating and re-rating of bonds is followed with great interest by borrowers and lenders and can give rise to some heated argument – *see* Exhibit 16.3. The exhibit also shows the proportion of bonds in each credit rating category defaulting in a five-year period. Those rated below investment grade have a much higher probability of default than high-grade bonds. For example CCC bonds had a worse than 50:50 chance of default.

**FIGURE 16.2**

**A comparison of Standard & Poor's and Moody's rating scales**

Standard & Poor's	Moody's	
AAA	Aaa	Investment grade bonds
AA+	Aa1	
AA	Aa2	
AA–	Aa3	
A+	A1	
A	A2	
A–	A3	
BBB+	Baa1	
BBB	Baa2	
BBB–	Baa3	
BB+	Ba1	Non-investment grade. High-yield 'junk' bonds
BB	Ba2	
BB–	Ba3	
B+	B1	
B	B2	
B–	B3	
CCC+	Caa1	
CCC	Caa2	
CCC–	Caa3	
CC	Ca	
C	C	



## Companies and regulators go on the offensive in the global ratings game

Charles Batchelor

In public, at least, senior executives do not usually take issue with the ratings the credit agencies apply to their debt. But British Airways' reaction to the decision by Standard & Poor's on Tuesday to cut its long term credit rating to junk was an exception.

John Rishton, BA's finance director, expressed 'astonishment' that the agency should downgrade its credit rating at a time when the airline's fortune seemed to be improving.

'The [Iraq] war is over; Sars [severe acute respiratory syndrome] is fading; the US economy is showing signs of recovery and traffic volumes are improving from the worst levels,' an exasperated Mr Rishton explained. 'We have delivered all our targets and more.'

Mr Rishton is not alone in objecting publicly to a ratings agency downgrade. ThyssenKrupp was furious in February when its debt was downgraded to junk because of the scale of its pension deficit. 'S&P's decision is incomprehensible,' the German steelmaker said. 'The facts concerning ThyssenKrupp have not changed.'

In the past it has been rare for companies – who pay the agencies for their credit ratings – to attack them in public. However, agencies have recently been under fire for not spotting big financial catastrophes such as the Asian financial crisis of 1997 or the downfall of Enron in 2001.

For example, the three leading agencies – S&P, Moody's and Fitch – all accorded Enron investment grade status until four days before the US energy group's collapse.

... Chris Legge, head of European industrial ratings at S&P, defends the

fact that the agencies sometimes appear to lag behind events by pointing out that they are taking a medium-term view – over three to five years – of a company's prospects.

S&P kept KPN, the Dutch telecommunications group, on investment grade throughout 2000-01 when the financial markets regarded its debt as, in effect, junk. KPN sorted out its finances and has since been upgraded.

There is a difficulty in timing, he argues. If an agency moves too soon on a downgrade, it risks being accused of triggering a company's problems. Too late and is blamed for missing the boat.

Ratings agencies argue that the key to their success has always been independent assessment. 'No company has ever said it is the right time to have a downgrade,' says Mr Legge.

The credit rating game is dominated by two agencies – S&P and Moody's Investors Service – which account for 80 per cent of the rating business.

Moody's rates 85,000 securities with a value of more than \$30,000bn (£17,982bn) while S&P provides ratings for \$30,000bn of debt from 37,000 issuers, including companies and government agencies.

They are followed, at some distance, by the French-owned Fitch Ratings and a fourth agency, Dominion Bond Rating Service, was added to the list of those approved by the US authorities this year.

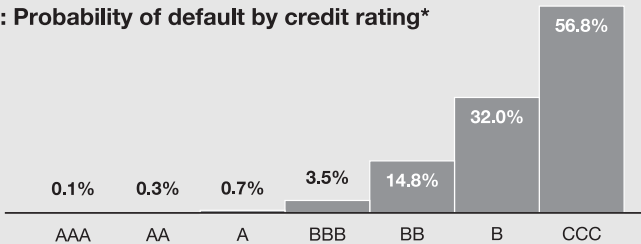
S&P denies there is any conflict in charging the organisations it rates. But critics say there could be a temptation for it to be less aggressive on some debt ratings in a bid to win business with other issuers.

Some in the debt markets even suggest that the US agencies gave lenient ratings to European issuers in order to break into the market. ‘There was pressure to get as many ratings as possible to get into Europe,’ says one credit analyst.

‘This led to ratings inflation.’ Since then, he argues, agencies have been adjusting them downwards to more realistic levels.

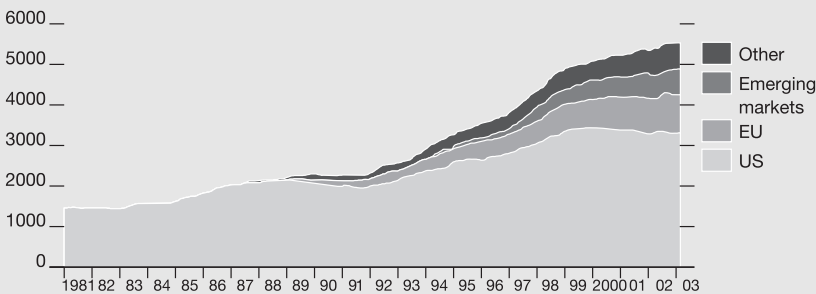
Mr Legge says this would be business suicide. ‘Our integrity is critical and is subject to scrutiny every day in the markets,’ says Chris Legge, head of European industrial ratings at S&P. ‘The predictive capacity of our ratings is good: that is why we are taken seriously.’

**S&P: Probability of default by credit rating\***



\* over five year period

**Number of issuers of debt**



**EXHIBIT 16.3** Companies on the offensive in the global ratings game

Source: *Financial Times* 5/6 July 2003

When examining data on default rates it is important to appreciate that default is a wide-ranging term, and could refer to any number of events from a missed payment to bankruptcy. For some of these events all is lost from the investor’s perspective. For other events a very high percentage, if not all, of the interest and principal is recovered. Hickman (1958) observed that defaulted publicly held and traded bonds tended to sell for 40 cents on the dollar. This average recovery rate rule-of-thumb seems to have held over time. Standard & Poor’s published a study of the recovery rates on defaulted bond issues in 1999. They obtained prices of defaulted bonds at the end of the default month for 533 S&P-rated straight-debt issues that defaulted between 1 January 1981 and 1 December 1997. Roughly, investors who liquidate a position in defaulted subordinated securities shortly after default can expect to recover, on average, 36–37 cents in the dollar.

Examples of ratings on long-term instruments are given in Table 16.1. The ratings here are for January 2004 and will not necessarily be applicable in future years because the creditworthiness and the specific debt issue can change significantly in a short period.

**TABLE 16.1**  
**Examples of ratings on long-term instruments in January 2004**

	Currency of borrowing	S&P	Moody's	Interest (bid yield)
Canada (govt. of)	US\$	AAA	Aaa	3.26
Toyota	Yen	AAA	Aaa	0.58
Wal-Mart	US\$	AAA	Aa2	3.86
Du Pont	US\$	AA-	Aa3	3.95
Unilever	US\$	A+	A1	4.38
France Telecom	£	BBB	Baa3	6.38
Ford Motor	€	BBB-	A3	2.91
DaimlerChrysler	£	BBB	A3	5.51
Gazprom (Russian)	US\$	B+	N/a	7.59
Invensys	€	B	Ba3	8.44
Argentina	US\$	D	Ca	27.50
Argentina	€	D	Ca	45.55

Source: Shown in the *Financial Times* daily – see tables headed 'Global Investment Grade' and 'High Yield & Emerging Market Bonds'; particular issued used is 9 January 2004

A lot of weight is placed on bond ratings by investors and regulators. Sometimes they feel aggrieved when the analyst's powers of observation and judgment on default likelihood turn out to be limited. Standard and Poor's was severely criticized in 2003 for not noticing the deterioration in the Italian food giant, Parmalat until it was general knowledge. However, the agency hit back: 'We rely on the honesty and truthfulness of public audited information and private information,' an S&P spokesman said. 'We are not empowered or able to detect fraud. We are neither auditors nor regulators.'<sup>1</sup> Parmalat allegedly falsified documents showing €4bn in a bank account that did not actually exist. Investigators believe that €10bn is likely to be found missing from the company. Bond investors are likely to lose their entire investments.

## Mezzanine debt and high-yield (junk) bonds

Mezzanine debt is debt offering a high return with a high risk. It may be either unsecured or secured but ranking behind senior loans. This type of debt generally offers interest rates two to nine percentage points more than that on senior

debt and frequently gives the lenders some right to a share in equity values should the firm perform well. It is a kind of hybrid finance ranking for payment below straight debt but above equity – it is thus described alternatively as *subordinated*, *intermediate*, or *low grade*. One of the major attractions of this form of finance for the investor is that it often comes with equity warrants or share options (see Chapter 19) attached which can be used to obtain shares in the firm – this is known as an ‘equity kicker’. These may be triggered by an event such as the firm joining the stock market.

**It is a kind of hybrid finance ranking for payment below straight debt but above equity.**

Mezzanine finance tends to be used when bank borrowing limits are reached and the firm cannot or will not issue more equity. The finance it provides is cheaper (in terms of required return) than would be available on the equity market and it allows the owners of a business to raise large sums of money without sacrificing control. It is a form of finance which permits the firm to move beyond what is normally considered acceptable debt:equity ratios (gearing or leverage levels).

Bonds with high-risk and high-return characteristics are called high-yield (junk) bonds (they are rated below investment grade by rating agencies with ratings of BBs, Bas, Bs and Cs). These may be bonds that started as apparently safe investments but have now become more risky (‘fallen angels’) or they may be bonds issued specifically to provide higher-risk finance instruments for investors. This latter type began its rise to prominence in the USA in the 1980s.

**The US junk bond market has grown from almost nothing in the early 1980s to over \$100bn of new issues each year.**

The US junk bond market has grown from almost nothing in the early 1980s to over \$100bn of new issues each year. This money has been used to spectacular effect in corporate America – the most outstanding event was the \$25bn takeover of RJR Nabisco using primarily junk bonds. The rise of the US junk bond market meant that no business was safe from the threat of takeover, however large – see Case study 16.1.

The high-yield bond is much more popular in the USA than in Europe because of the aversion (constrained by legislation) to such instruments in the major financial institutions. The European high-yield bond market is in its infancy. The first high-yield bonds denominated in European currencies were issued as recently as 1997 when Geberit, a Swiss/UK manufacturer, raised DM 157.5m by selling ten-year bonds offering an interest rate which was 423 basis points (4.23 percent) higher than the interest rate on a ten-year German government bond (bund). Since then there have been over 100 issues. Nevertheless the European high-yield market remains about one-tenth the size of the US one. Exhibit 16.4 shows that although the market remains small relative to the investment-grade market in Europe and the high-yield bond market in the USA there has been the shift in the euro-denominated bond market toward high-yielders.

**Case study 16.1****The junk bond wizard: Michael Milken**

While studying at Wharton Business School in the 1970s Michael Milken came to the belief that the gap in interest rates between safe bonds and high-yield bonds was excessive, given the relative risks. This created an opportunity for financial institutions to make an acceptable return from junk bonds, given their risk level. At the investment banking firm Drexel Burnham Lambert, Milken was able to persuade a large body of institutional investors to supply finance to the junk bond market as well as provide a service to corporations wishing to grow through the use of junk bonds. Small firms were able to raise billions of dollars to take over large US corporations. Many of these issuers of junk bonds had debt ratios of 90% and above – for every \$1 of share capital \$9 was borrowed. These gearing levels concerned many in the financial markets. It was thought that companies were pushing their luck too far and indeed many did collapse under the weight of their debt. The market was dealt a particularly severe blow when Michael Milken was sentenced for infringing various laws, sent to jail and ordered to pay \$600m in fines. Drexel was also convicted, paid \$650m in fines and filed for bankruptcy in 1990. The junk bond market was in a sorry state in the early 1990s, with high levels of default and few new issues. However it did not take long for the market to recover. In 1993 \$69.1bn was raised in junk bond issues and the annual amount raised has stayed well above \$40bn since then.

Increasingly the term mezzanine finance is being confined to the high-yield/high-risk debt that is private rather than a publicly traded bond. There has been a rapid growth in this private-based mezzanine finance over the last 15 years. It has proved to be particularly useful to managers involved in those management buyouts (MBO) that require high levels of debt, that is, leveraged buyouts (LBOs). A typical LBO would have a financial structure as follows:

**The term mezzanine finance is being confined to the high-yield/high-risk debt that is private.**

- 60 percent from senior bank or other debt providers;
- 25–30 percent from subordinated debt – for example, mezzanine finance, unsecured low-ranking bonds and/or preference shares;
- 10–15 percent equity.

Fast-growing companies also make use of mezzanine finance. It has proved a particularly attractive source for cable television companies, telecommunications and some media businesses which require large investments in the near term but also offer a relatively stable profits flow in the long term.

Exhibit 16.5 describes the importance of the mezzanine finance market in Europe.

Mezzanine financing has been employed, not only by firms ‘gearing themselves up’ to finance merger activity, but also for leveraged recapitalizations. For instance, a firm might have run into trouble, defaulted and its assets are now under the control of a group of creditors, including bankers and bondholders. One way to allow the business to continue would be to persuade the creditors to accept alternative

## Jump in issuance 'could lead to defaults'

Charles Batchelor

The recent sharp rise in the volume of euro-denominated 'junk' bond issues could lead to a surge in corporate defaults in about three years if the pattern of previous debt cycles is repeated.

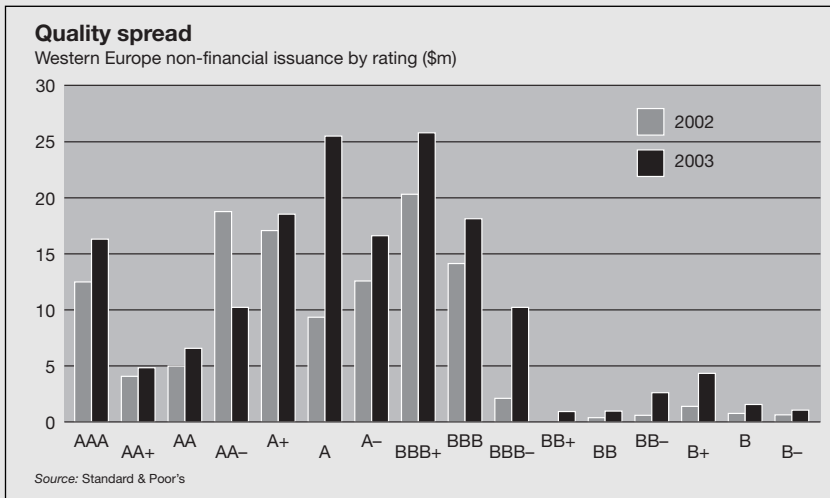
This warning is contained in the annual review of European credit trends by Standard & Poor's, a leading credit rating agency.

Junk or speculative grade issuance – up to BB+ according to the agency's rankings – had risen 170 per cent this year to \$13bn by mid-November, com-

pared with a 24 per cent rise in non-financial bond issues to \$191bn.

'It remains to be seen whether the increase in speculative-grade issuance in Europe is a healthy sign of market maturity or the harbinger of the next credit crisis,' said Barbara Ridpath, chief credit officer for Europe at S&P.

... The number of rating downgrades fell in 2003 and is expected to fall further next year. But downgrades still numbered 304 in the year to mid-November compared with only 66 upgrades.



### EXHIBIT 16.4 Jump in issuance 'could lead to defaults'

Source: *Financial Times* 10 December 2003

financial securities in place of their debt securities to bring the leverage to a reasonable level. They might be prepared to accept a mixture of shares and mezzanine finance. The mezzanine instruments permit the holders to receive high interest rates in recognition of the riskiness of the firm, and they open up the possibility of an exceptionally high return from warrants or share options should the firm get back to a growth path. The alternative for the lenders may be a return of only a few pence in the pound from the immediate liquidation of the firm's assets.

Mezzanine finance and high debt levels impose a high fixed cost on the firm and can be a dangerous way of financing expansion and therefore have their critics. On the other hand, some commentators have praised the way in which

## Flexibility catches eye of investors

Rebecca Bream

### Mezzanine investors take higher risks than bond buyers but get higher returns

While bond markets have been buffeted by volatility in recent months, private markets such as mezzanine debt have come into their own and impressed investors with their flexibility.

Mezzanine debt has long been used by mid-cap companies in Europe and the US as a funding alternative to high yield bonds or bank debt. This product ranks between senior bank debt and equity in a company's capital structure, and mezzanine investors take higher risks than bond buyers but are rewarded with equity-like returns ...

Companies that are too small to tap the bond markets have been the traditional users of mezzanine debt, but it is increasingly being used as part of the financing package for larger leveraged acquisition deals. Although mezzanine has been more expensive for companies to use than junk bonds, the recent spread widening in the high yield debt markets has closed this source of funding and has made mezzanine look better value ...

'There has been a lot of hype over the past few years about high yield

bonds crowding out mezzanine debt, but now the situation is reversing,' says Simon Collins, head of debt advisory services at KPMG ...

The structures of leveraged finance transactions are evolving to cope with the increased market volatility, and a greater use of mezzanine debt is part of this trend ...

The characteristics of the mezzanine market make it well-suited to LBO deals – money can be raised quickly and discreetly as companies negotiate directly with mezzanine funds. 'There are inherent advantages to using mezzanine over high yield bonds. It is more flexible, offers better call protection and can be structured specifically for each deal,' says Mark Brunault, executive director at Pricoa.

New investors are being drawn to the European mezzanine market in search of higher returns, as illustrated by the burgeoning number of new funds established this year. In July, Mezzanine Management raised one of the largest independent mezzanine funds in the European market, worth \$525m. Its first investment was a \$12m mezzanine finance and equity injection into UK media monitoring company Xtreme Information ...

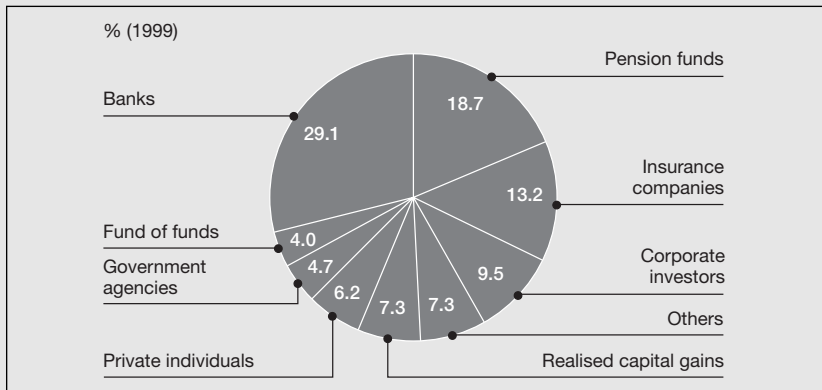
Many of the funds in the mezzanine market are cash rich, because of the popularity of the product and due to the current lack of major investment opportunities ...

Mezzanine fund managers are unlikely to rush into deals, though, having recently been reminded of the risks involved in the mezzanine market. At the start of October Finelist, the car parts distributor that was bought by French rival Autodis in March, went into receivership. The €505m buy-

### New European funds raised



### Sources of new funds raised



Source: Global Private Equity 2000

out had been financed with leveraged loans and €275m of mezzanine debt, and had one of the largest deals in the European mezzanine market.

Finelist's collapse was triggered when it broke financial covenants on its debt, and receivers Ernst & Young have since been readying the business for sale and looking into allegations of

financial irregularities. While the bank lenders have a good chance of recovering their money, the mezzanine lenders risk losing their subordinated investment. Goldman Sachs, which arranged the buy-out's financing, is thought to hold more than half of the imperilled mezzanine debt in its Mezzanine Partners II fund.

### EXHIBIT 16.5 Flexibility catches the eye of investors

Source: *Financial Times* 3 November 2000

high gearing and large annual interest payments have focussed the minds of managers and engendered extraordinary performance. Also, without this finance, many takeovers, buyouts and financial restructurings would not take place.

### Financing a leveraged buyout

If the anticipated cash flows are reasonably stable then a highly leveraged buyout may give an exceptional return to the shareholders. Take the case of Sparrow, a subsidiary of Hawk plc. The managers have agreed a buyout price of £10m, equal to Sparrow's assets. They are able to raise £1m from their own resources to put into equity capital and have borrowed £9m. The debt pays an interest rate of 14 percent and the corporate tax rate is 25 percent (payable one year after year end). Profits before interest and tax in the first year after the buyout are expected to be £1.5m and will grow at 25 percent per annum thereafter. All earnings will be retained within the business to pay off debt.

**highly leveraged buyout may give an exceptional return to the shareholders.**



**TABLE 16.2****Sparrow – Profit and Loss Account and Balance Sheet (£000s)**

	Years					
	1	2	3	4	5	6
Profit before interest and taxes (after depreciation)	1,500	1,875	2,344	2,930	3,662	4,578
Less interest	1,260	1,226	1,144	999	770	433
	240	649	1,200	1,931	2,892	4,145
Tax	0	60	162	300	483	723
Profits available to pay off debt	240	589	1,038	1,631	2,409	3,422

**Balance Sheet**

	Year						
	Opening	1	2	3	4	5	6
Equity	1,000	1,240	1,829	2,867	4,498	6,907	10,329
Debt	9,000	8,760	8,171	7,133	5,502	3,093	0
Assets	10,000	10,000	10,000	10,000	10,000	10,000	10,329

Notes: Past tax liabilities have been accepted by Hawk. Money set aside for depreciation is used to replace assets to maintain £10m of assets throughout. Also depreciation equals capital allowances used for tax purposes.

In the first few years the debt burden absorbs a large proportion of the rapidly increasing profits. However it only takes six years for the entire debt to be retired. The shareholders then own a business with assets of over £10m, an increase of over tenfold on their original investment. The business is also producing a large annual profit, which could make a stock market flotation attractive, in which case the value of the shares held by the management will probably be worth much more than £10m.<sup>2</sup>

## Convertible bonds

Convertible bonds carry a rate of interest in the same way as vanilla bonds, but they also give the holder the right to exchange the bonds at some stage in the future into ordinary shares according to some prearranged formula. The owner of these bonds is not obliged to exercise this right of conversion and so the bond may continue until redemption as an interest-bearing instrument. Usually the

*conversion price* is 10–30 percent greater than the existing share price. So if a £100 bond offered the right to convert to 40 ordinary shares the conversion price would be £2.50 which, given the current market price of the shares of, say, £2.20, would be a *conversion premium* of:

$$\frac{2.50 - 2.20}{2.20} = 0.136 \text{ or } 13.6$$

In a rising stock market it is reasonable to suppose that most convertible bonds issued with a small conversion premium will be converted to shares. However this is not always the case. Northern Foods (with the brand names Express Dairies, Eden Vale, Fox's Biscuits, Palethorpe Sausages, Pork Farms and Bowyers) issued convertible bonds in February 1993. The issue raised £91.28m. The bonds were to be redeemed in 15 years if they had not been converted before this and were priced at a par value of £100. The coupon was set at 6.75 percent and the conversion price was at 326p per share. From this information we can calculate the *conversion ratio*:

$$\text{Conversion ratio} = \frac{\text{Nominal (par) value of bond}}{\text{Conversion price}} = \frac{\text{£}100}{\text{£}3.26} = 30.67 \text{ shares}$$

Each bond carries the right to convert to 30.67 shares, equivalent to paying 326p for each share at the £100 par value of the bond.

The conversion price was set at a premium of 18.11 percent over the ordinary share price at the time of pricing which was 276p ( $(326 - 276)/276 = 18.11\%$ ). At the time of the issue many investors may have looked at the low interest rate on the convertible (for 15-year bonds in 1993, 6.75 percent was low) and said to themselves that although this was greater than the dividend yield on shares (4–5 percent) it was less than that on conventional bonds, but offsetting this was the prospect of capital gains made by converting the bonds into shares. If the shares rose to, say, £4, each £100 bond could be converted to 30.67 shares worth  $30.67 \times \text{£}4 = \text{£}122.68$ . Unfortunately the share price by 2004 had fallen to about £1.35 and so the conversion right had not gained any intrinsic value – perhaps by the year 2008 it will be worthwhile exchanging the bonds for shares. In the meantime the investors at least have the comfort of a £6.75 coupon every year.

The value of a convertible bond (also called an 'equity-linked bond') rises as the value of ordinary shares increases, but at a lower percentage rate. If the share price rises above the conversion price the investor may exercise the option to convert if he/she anticipates that the share price will at least be maintained. If the share price rise is seen to be temporary the investor may wish to hold on to the bond. If the share price falls or rises by only a small amount the value of the convertible will be the same as a straight bond at maturity.

**FIGURE 16.3****Summary of convertible bond technical jargon**

- **Conversion ratio** This gives the number of ordinary shares into which a convertible bond may be converted:

$$\text{Conversion ratio} = \frac{\text{Nominal (par) value of bond}}{\text{Conversion price}}$$

- **Conversion price** This gives the price of each ordinary share obtainable by exchanging a convertible bond:

$$\text{Conversion price} = \frac{\text{Nominal (par) value of bond}}{\text{Number of shares into which bond may be converted}}$$

- **Conversion premium** This gives the difference between the conversion price and the market share price, expressed as a percentage:

$$\text{Conversion premium} = \frac{\text{Conversion price} - \text{Market share price}}{\text{Market share price}} \times 100$$

- **Conversion value** This is the value of a convertible bond if it were converted into ordinary shares at the current share price:

$$\text{Conversion value} = \text{Current share price} \times \text{Conversion ratio}$$

Most convertible bonds are unsecured but as the Case study on Greenhills shows, this is not always the case – a good thing for Hunter Ground!

**Case study 16.2****SECURED CONVERTIBLE DEBENTURES****Greenhills**

The first AIM-traded company to go into receivership was Greenhills, the restaurant operator. A major investor, Hunter Ground, appointed administrative receivers on 4 December 1996. Hunter Ground held secured convertible debentures from Greenhills worth £506,000.

Source: *Investors Chronicle*, 20 December 1996, p. 11. Reprinted with kind permission of the *Investors Chronicle*.

**Advantages to the company of convertible bonds**

Convertible bonds have the following advantages to the company.

1. *Lower interest than on a similar debenture* The firm can ask investors to accept a lower interest on these debt instruments because the investor values the conversion right. This was a valuable feature for many dot.com companies in the late 1990s. Companies such as Amazon and AOL could pay

- 5–6 percent on convertibles – less than half what they would have paid on straight bonds. In the case of Rank's convertible, issued in 2003, the coupon is 3.875 percent compared with 7.25 percent on a straight bond, saving £3m per year<sup>3</sup> – see Exhibit 16.6.
2. *The interest is tax deductible* Because convertible bonds are a form of debt the coupon payment can be regarded as a cost of the business and can therefore be used to reduce taxable profit.
  3. *Self liquidating* When the share price reaches a level at which conversion is worthwhile the bonds will (normally) be exchanged for shares so the company does not have to find cash to pay off the loan principal – it simply issues more shares. This has obvious cash flow benefits. However the disadvantage is that the other equity holders may experience a reduction in earnings per share and dilution of voting rights.
  4. *Fewer restrictive covenants* The directors have greater operating and financial flexibility than they would with a secured debenture. Investors accept that a convertible is a hybrid between debt and equity finance and do not tend to ask for high-level security, impose strong operating restrictions on managerial action or insist on strict financial ratio boundaries – notwithstanding the case of Greenhills (see Case study 16.2).
  5. *Underpriced shares* A company which wishes to raise equity finance over the medium term, but judges that the stock market is temporarily underpricing its shares, may turn to convertible bonds. If the firm does perform as the managers expect and the share price rises, the convertible will be exchanged for equity.

## Rank's £150m bond beefs up finances

By Charles Batchelor

Rank, the leisure group that owns the Hard Rock Café brand, yesterday launched a £150m convertible bond in a further strengthening of its finances.

The bond, convertible into about 40m rank shares or 6.7 per cent of the company's existing equity at any time up to January 2009, will be used to repay existing debt and reduce financing costs.

Rank is taking advantage of the recent fall in bond interest rates that has prompted a round of refinancings of older, more expensive debt by a wide range of companies. Convertible issues

allow companies to strengthen their finances without issuing shares and mean investors have to pay a premium if they do want to buy the shares. ...

The convertible will replace an existing £125m bond that carries a higher dividend – 7.25 per cent – and will save Rank about £3m in interest charges a year, equal to a 1.5 per cent boost in earnings per share. The new convertible was priced to carry a coupon of 3.875 per cent and to convert when the Rank share price is 31 per cent above yesterday's price of 287p – at 376p.

### EXHIBIT 16.6 Rank's £150m bond beefs up finances

Source: *Financial Times* 4 December 2003

## Advantages to the investor

The advantages of convertible bonds to the investor are as follows.

- They are able to wait and see how the share price moves before investing in equity.
- In the near term there is greater security for their principal compared with equity investment, and the annual coupon is usually higher than the dividend yield (annual dividend on shares divided by share price).

## Exchangeable bonds

The bonds sold may not give the right to conversion into shares of the issuers, but shares of another company held by the issuer – *see* the cases of Hutchison and Whampoa, Telecom Italia and France Telecom in Exhibit 16.7. Note that the term exchangeable bond is probably more appropriate in these cases.

## Valuing bonds

Bonds, particularly those traded in secondary markets such as the London Stock Exchange, are priced according to supply and demand. The main influences on the price of a bond will be the general level of interest rates for securities of that risk level and maturity. If the coupon is less than the current interest rate the bond will trade at less than the par value of £100. Take the case of an

### Brakes applied to convertible bond market

**One of Europe's most active periods of issuance has been slowed by volatile equities, writes Rebecca Bream**

In January Hong Kong conglomerate Hutchison Whampoa sold \$2.65bn of bonds exchangeable into shares of Vodafone, the UK mobile phone operator. Hutchison had been gradually divesting its stake in the UK group since completing a \$3bn exchangeable bond deal last September.

This was followed at the end of the month by Telecom Italia which sold

€2bn of bonds exchangeable into shares of subsidiaries Telecom Italia Mobile and Internet operator Seat.

In February France Telecom sold €3.3bn of bonds exchangeable into shares of Orange, completed at the same time as the mobile unit's IPO, and one of the biggest exchangeable bond deals ever sold in Europe.

### EXHIBIT 16.7 Brakes applied to convertible bond market

Source: *Financial Times* 6 April 2001

irredeemable bond (where coupons are paid every year forever) with an annual coupon of 8 percent of the par value, i.e. £8 per year. When the bond was first issued general interest rates for this risk class may well have been 8 percent and so the bond may have been sold at £100. However interest rates change over time. Suppose that the rate demanded by investors is now 10 percent. Investors will no longer be willing to pay £100 for an instrument that yields £8 per year. The current market value of the bond will fall to £80 (£8/0.10) because this is the maximum amount needed to pay for similar bonds given the current interest rate of 10 percent. If the coupon is more than the current market interest rate the market price of the bond will be greater than the nominal (par) value. Thus if markets rates are 6 percent the irredeemable bond will be priced at £133.33 (£8/0.06).

The formula relating the price of an irredeemable bond, the coupon and the market rate of interest is:

$$P_D = \frac{i}{k_D}$$

where

$P_D$  = price of bond

$i$  = nominal annual interest (the coupon rate  $\times$  nominal (par) value of the bond)

$k_D$  = market discount rate, annual return required on similar bonds

Also:

$$V_D = \frac{I}{k_D}$$

where

$V_D$  = total market value of all the bonds

$I$  = total annual nominal interest payable on all the bonds

We may wish to establish the market rate of interest represented by the market price of the bond. For example, if an irredeemable bond offers an annual coupon of 9.5 percent and is currently trading at £87.50, with the next coupon due in one year, the rate of return is:

$$k_D = \frac{i}{P_D} = \frac{9.5}{87.5} = 0.1086 \text{ or } 10.86\%$$

## Redeemable bonds

A purchaser of a redeemable bond buys two types of income promise; first the coupon, second the redemption payment. The amount that an investor will pay depends on the amount these income flows are worth when discounted at the

rate of return required on that risk class of debt. The relationships are expressed in the following formulae:

$$P_D = \frac{i_1}{1 + k_D} + \frac{i_2}{(1 + k_D)^2} + \frac{i_3}{(1 + k_D)^3} + \dots + \frac{R_n}{(1 + k_D)^n}$$

and:

$$V_D = \frac{I_1}{1 + k_D} + \frac{I_2}{(1 + k_D)^2} + \frac{I_3}{(1 + k_D)^3} + \dots + \frac{R_n^*}{(1 + k_D)^n}$$

where

- $i_1, i_2$  and  $i_3$  = nominal interest per bond in years 1, 2 and 3...up to  $n$  years
- $I_1, I_2$  and  $I_3$  = total nominal interest in years 1, 2 and 3...up to  $n$  years
- $R_n$  and  $R_n^*$  = redemption value of a bond, and total redemption of all bonds in year  $n$ , at the redemption date, year  $n$ .

The Worked example of Blackaby illustrates the valuation of a bond when the market interest rate is given.

**Worked example 16.1**  
**BLACKABY PLC**

Blackaby plc issued a bond with a par value of £100 in September 2001, redeemable in September 2007 at par. The coupon is 8% payable annually in September. The facts available from this are:

- the bond might have a par value of £100 but this may not be what investors will pay for it;
- the annual cash payment will be £8 (8% of par);
- in September 2007, £100 will be handed over to the bondholder.

*Question 1*

What is the price investors will pay for this bond at the time of issue if the market rate of interest for a security in this risk class is 7%?

*Answer*

$$P_D = \frac{8}{1 + 0.07} + \frac{8}{(1 + 0.07)^2} + \frac{8}{(1 + 0.07)^3} + \dots + \frac{8}{(1 + 0.07)^6} + \frac{100}{(1 + 0.07)^6}$$

£8 annuity for 6 years @ 7% = 4.7665 ¥ £8 = 38.132

plus  $\frac{100}{(1 + 0.07)^6}$  = 66.634

$P_D =$  £104.766

**Question 2**

What is the bond's value in the secondary market in September 2004 if interest rates rise by 200 basis points between 2001 and 2004? (Assume the next coupon payment is in one year.)

**Answer**

$$\begin{array}{rcl}
 P_D = \text{£}8 \text{ annuity for 3 years @ 9\%} & = & 2.5313 \text{ ¥ } 8 & = & 20.25 \\
 \text{plus } \frac{100}{(1 + 0.09)^3} & & & = & 77.22 \\
 & & & & \hline
 & & & & \text{£}97.47
 \end{array}$$

Note that as interest rates rise the price of bonds falls.

If we need to calculate the rate of return demanded by investors from a particular bond when we know the market price and the coupon amounts we compute the internal rate of return. For example Bluebird plc issued a bond many years ago which is due for redemption at par of £100 in three years. The coupon is 6 percent and the market price is £91. The rate of return now offered in the market by this bond is found by solving for  $k_D$ :

$$P_D = \frac{i_1}{1 + k_D} + \frac{i_2}{(1 + k_D)^2} + \frac{R_n + i_3}{(1 + k_D)^3}$$

$$91 = \frac{6}{1 + k_D} + \frac{6}{(1 + k_D)^2} + \frac{106}{(1 + k_D)^3}$$

The skills learned in calculating internal rates of return in Chapter 2 are needed to solve this. At an interest rate ( $k_D$ ) of 9 percent, the right side of the equation amounts to £92.41. At an interest rate of 10 percent the right-hand side of the equation amounts to £90.05. Using linear interpolation:

Interest rate	9%	?	10%
Value of discounted cash flows	£92.41	£91	£90.05

$$k_D = 9\% + \frac{92.41 - 91}{92.41 - 90.05} \times (10 - 9) = 9.6\%$$

**The two types of interest yield**

There are two types of yields used for fixed-interest securities. The *income yield* (also known as the flat yield, interest yield and running yield) is the gross (before tax) interest amount divided by the current market price of the bond expressed as a percentage:



$$\frac{\text{Gross interest (coupon)}}{\text{Market price}} \times 100$$

Thus for a holder of Bluebird's bonds the income yield is:

$$\frac{\pounds 6}{\pounds 91} \times 100 = 6.59\%$$

This is a gross yield. The after-tax yield will be influenced by the investor's tax position.

$$\text{Net interest yield} = \text{Gross yield} (1 - T),$$

where  $T$  = the tax rate applicable to the bondholder

The income yield is not the true rate of return available to the investor should he/she purchase the bond because it fails to take into account the capital gain (or loss) from holding the bond. At a time when bonds in the same risk class are offering rates of return greater than 6.59 percent it is obvious that any potential purchaser of Bluebird bonds in the market will be looking for a return other than from the coupon. That additional return comes in the form of a capital gain over three years of £9. The investor purchases at £91 and will receive the £100 par value when the bond is redeemed in three years. A rough estimate of this annual gain is  $(9/91) \div 3 = 3.3$  percent per year.

When this is added to the interest yield we have an approximation to the second type of yield, the yield to maturity (also called the redemption yield). The yield to maturity of a bond is the discount rate such that the present value of all the cash inflows from the bond (interest plus principal) is equal to the bond's current market price. The rough estimate of 9.89 percent (6.59% + 3.3%) has not taken into account the precise timing of the investor's income flows. When this is adjusted for, the yield to maturity is 9.6 percent – the internal rate of return calculated above. Thus the yield to maturity includes both coupon payments and the capital gain or loss on maturity. The *Financial Times* quotes 'bid yields' for the bonds it displays – see Table 16.1 on page 414 and Exhibit 16.11 on pages 440–41 – and GRY (gross redemption yield) – see Exhibit 16.10 on pages 438–9. These can be read as the yield to maturity.

## International sources of debt finance

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Larger and more creditworthy companies have access to a wider array of finance than small firms. These companies can tap the *Euro-securities markets*, which are informal (unregulated) markets in money held outside its country of origin. For example there is a large market in *Eurodollars*. These are dollar credits (loans) and deposits managed by a bank not resident in the USA. This has the dis-

**Euro-securities markets are informal (unregulated) markets in money held outside its country of origin.**

tinct advantage of transactions not being subject to supervision and regulation by the authorities in the USA. So, for example, an Italian firm can borrow dollars from a Spanish bank in the UK and the US regulatory authorities have no control over the transaction.

There is a vast quantity of dollars held outside the USA and this money is put to use by borrowers. The same applies to all the major currencies – the money is lent and borrowed outside its home base, so is beyond the reach of the domestic regulators. Today it is not unusual to find an individual holding a dollar account at a UK bank – a *Eurodeposit* account – which pays interest in dollars linked to general dollar rates. This money can be lent to firms wishing to borrow in Eurodollars prepared to pay interest and capital repayments in dollars. There are large markets in Euromarks, Eurosterling and Euroyen.<sup>4</sup> The title ‘Euro’ is misleading as this market is not limited to the European currencies or European banks and is unconnected with the European single currency, the euro. The title came about because the modern market was established when the Soviet Union transferred dollars from New York to a French bank at the height of the cold war in 1957. The cable address happened to be EUROBANK. The euro currency was not even a gleam in the eye of a euro-enthusiast at the time. Nowadays, Eurosecurities business is transacted daily in all of the major financial centers.

The companies large enough to use the Eurosecurities markets are able to put themselves at a competitive advantage *vis-à-vis* smaller firms. There are at least four advantages:

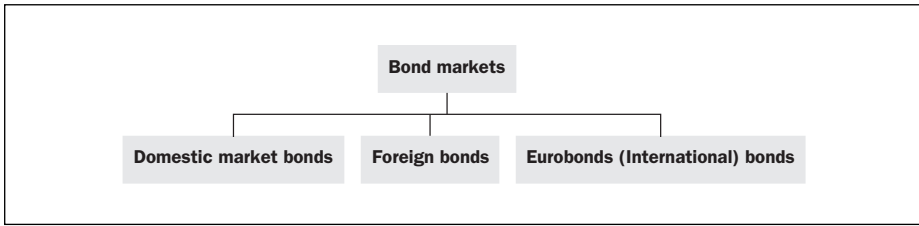
- The finance available in these markets can be at a lower cost in both transaction costs and rates of return.
- There are fewer rules and regulations.
- There may be an ability to hedge foreign currency movements. For example, if a firm has assets denominated in a foreign currency it can be advantageous to also have liabilities in that same currency to reduce the adverse impact of exchange-rate movements (see Chapter 21).
- National markets are often not able to provide the same volume of finance. The borrowing needs of some firms are simply too large for their domestic markets to supply. To avoid being hampered in expansion plans large firms can turn to the international market in finance.

For these internationally recognized firms there are three sources of debt finance:

- the domestic or national market;
- the financial markets of other countries which make themselves open to foreign firms – *the foreign debt market*;
- the Eurosecurities market which is not based in any one country, so is not regulated by any country.

For example, there are three bond markets available to some firms – as shown in Figure 16.4.

**FIGURE 16.4**  
**Bond markets**



## Foreign bonds

A foreign bond is a bond denominated in the currency of the country where it is issued when the issuer is a non-resident. For example, in Japan bonds issued by non-Japanese companies denominated in yen are foreign bonds. (The interest and capital payments will be in yen.) Foreign bonds have been given some amusing names: foreign bonds in Tokyo are known as Samurai bonds, foreign bonds issued in New York and London are called Yankees and Bulldogs respectively. The Netherlands allows foreigners to issue Rembrandt bonds and in Spain Matador bonds are traded. Foreign bonds are regulated by the authorities where the bond is issued. These rules can be demanding and an encumbrance to companies needing to act quickly and at low cost. The regulatory authorities have also been criticized for stifling innovation in the financial markets. The growth of the less restricted Eurobond market has put the once dominant foreign bond market in the shade.

## Eurobonds (International bonds)

Eurobonds are bonds sold outside the jurisdiction of the country of the currency in which the bond is denominated. So, for example, the UK financial regulators have little influence over the Eurobonds denominated in sterling, even though the trans-

**Eurobonds are not subject to the rules and regulations which are imposed on foreign bonds.**

actions (for example interest and capital payments) are in pounds. They are medium- to long-term instruments. Eurobonds are not subject to the rules and regulations which are imposed on foreign bonds, such as the requirement to issue a detailed prospectus. More importantly they are not subject to an interest-withholding tax. In the UK most domestic bonds are subject to a withholding tax by which basic rate income tax is deducted before the investor receives interest. Interest on Eurobonds is paid gross without any tax deducted – which has attractions to investors keen on delaying, avoiding or evading tax. Moreover, Eurobonds are bearer bonds which means that the holders do not have to disclose their identity – all that is required to receive interest and capital is for the holder to have possession of the bond. In contrast, UK domestic bonds are registered, which means that companies and governments are able to identify the owners. Bearer bonds have to be kept in a safe place as a thief could benefit greatly from possession of a bearer bond.

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Despite the absence of official regulation, the International Securities Market Association (ISMA), a self-regulatory body founded in 1969 and based in Switzerland, imposes some restrictions, rules and standardized procedures on Eurobond issue and trading.

Eurobonds are distinct from euro bonds, which are bonds denominated in euros and issued in the euro currency area. Increasingly, people differentiate between the two by calling Eurobonds 'international bonds' leaving the title euro for the currency introduced in 1999. Of course, there have been euro-denominated bonds issued outside the jurisdiction of the authorities in the euro area. These are euro Eurobonds.

### **The development of the Eurobond market**

In the 1960s many countries, companies and individuals held surplus dollars outside of the USA. They were reluctant to hold these funds in American banks under US jurisdiction. There were various reasons for this. For example, some countries, particularly the former Soviet Union and other communist bloc countries of the cold war era, thought their interests were best served by using the dollars they had on the international markets, away from the powers of the US authorities to freeze or sequestrate (seize) assets. More recently this sort of logic has applied to countries such as Iran, Iraq and Libya. Also in the 1960s the American authorities had some very off-putting tax laws and created a tough regulatory environment in their domestic financial markets. These encouraged investors and borrowers alike to undertake transactions in dollars outside the USA. London's strength as a financial center, the UK authorities' more relaxed attitude to business, and its position in the global time zones, made it a natural leader in the Euro markets. The first Eurobond was issued in the early 1960s and the market grew modestly through the 1970s and then at a rapid rate in the 1980s. By then the Eurodollar bonds had been joined by bonds denominated in a wide variety of Eurocurrencies. The market was stimulated not only by the tax and anonymity benefits, which brought a lower cost of finance than for the domestic bonds, but also by the increasing demand from transnational companies and governments needing large sums in alternative currencies and with the potential for innovatory characteristics. It was further boosted by the recycling of dollars from the oil-exporting countries.

In 1979 less than \$20bn worth of bonds were issued in a variety of currencies. As can be seen from Table 16.3 the rate of new issuance is now over \$2,000bn a year, with a total amount outstanding of over \$10,000bn. In any one year approximately 40–50 percent of new bonds are denominated in dollars. Euro-denominated issues account for 40–50 percent of issues. The yen is the currency of issue for 5–10 percent of international bonds, with all the other currencies put together making up 10–15 percent. Even though the majority of Eurobond trading takes place through London, sterling is not one of the main currencies, and what is more, it tends to be large US and other foreign banks located in London which dominate the market.

**Sterling is not one of the main currencies.**

**TABLE 16.3**  
**International bond issues**

Year (\$bn)	1998	1999	2000	2001	2002	2003 1st 9 months
Straights – fixed rate	847	1,232	1,129	1,590	1,455	1,753
Equity-related	47	52	57	72	43	61
Floating-rate issues	293	485	518	643	603	382
<b>Total</b>	<b>1,186</b>	<b>1,769</b>	<b>1,704</b>	<b>2,305</b>	<b>2,101</b>	<b>2,195</b>

Source: Bank for International Settlements (BIS) *Quarterly Review*, www.BIS.org, December 2003, December 2002, November 2000, March 2001, June 2001, February 2000, March 1999.

While the Eurobond market was dominated by dollar issues for the first 39 years, in 2003 euro-denominated issues overtook dollar issues – see Exhibit 16.8.

### Types of Eurobonds (International bonds)

The Eurobond market has been extraordinarily innovative in producing bonds with all sorts of coupon payment and capital repayment arrangements (for example, the currency of the coupon changes half-way through the life of the bond, or the interest rate switches from fixed to floating rate at some point). We cannot go into detail here on the rich variety but merely categorize the bonds into broad types.

- *Straight fixed-rate bond* The coupon remains the same over the life of the bond. These are usually made annually, in contrast to domestic bond semi-annual coupons. The redemption of these bonds is usually made with a ‘bullet’ repayment at the end of the bond’s life.
- *Equity related* These take two forms:
  - *Bonds with warrants attached* Warrants are options which give the holder the right to buy some other asset at a given price in the future. An equity warrant, for example, would give the right, but not the obligation, to purchase shares. There are also warrants for commodities such as gold or oil, and for the right to buy additional bonds from the same issuer at the same price and yield as the host bond. Warrants are detachable from the host bond and are securities in their own right, unlike convertibles.
  - *Convertibles* The bondholder has the right (but not the obligation) to convert the bond into ordinary shares at a preset price.
- *Floating-rate notes (FRNs)* Table 16.3 shows the increasing importance of FRNs. These have a variable coupon reset on a regular basis, usually every three or six months, in relation to a reference rate, such as LIBOR. The size of the spread over LIBOR reflects the perceived risk of the issuer. The typical term for an FRN is about five to 12 years.

## European issues go from strength to strength

It began with Autostrade's international bond in 1963, writes Charles Batchelor

Euro-denominated bond issues have for the first time overtaken the much longer-established market for dollar-denominated international bonds, crowning the Eurobond market's 40th anniversary, just five years after the creation of the single European currency.

Autostrade, the Italian motorway operator, launched the Eurobond market in July 1963 with a £15m 15-year bond, creating the foundation for a market that employed thousands and also cemented London's position as an international financial centre.

'The events of 40 years ago provided the legal and financial structure that created the current market,' said Charlie Berman, co-head of European credit market at Citigroup. 'The story 40 years on from Autostrade is that the non-US capital market is as big and important as the US market. That is quite extraordinary.'

The US dominated the market for foreign bond issues in the post-war years.

The recurrent US balance of payments deficits meant there was no shortage of dollars held on deposit by banks outside the US and, by the end of the 1950s, the offshore dollar pool had climbed to \$17bn.

During 1962, the City realised that those dollars could support issues led by European banks. SG Warburg took the lead, negotiating with regulators in the UK and elsewhere to enable the launch of Autostrade's deal.

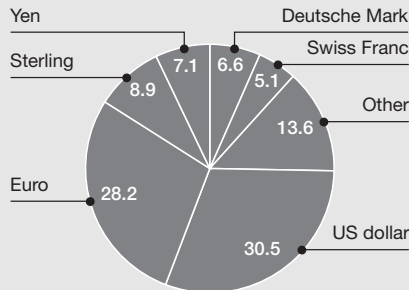
Two-and-a-half weeks later, the fledgling market received a crucial boost when President John F Kennedy announced the introduction of Interest Equalisation Tax. This aimed to improve the US balance of payments, but the result was to increase the cost of US borrowing by European issuers.

It was by no means certain London would emerge ahead of the continental European centres. Several US banks

### Bonds: 40 years down the road

#### Eurobond issues by currency\*

Market share, 1963-2003 (%)



Source: Thomson Financial

\* Total amount raised: \$8,248bn

had European bases in Paris while Swiss banks dominated distribution in the early years. Fortunately for the UK, the restrictive approach adopted by the tax authorities and banks in continental Europe made London a more efficient and profitable base.

In the early 1970s, the US authorities removed constraints intended to safeguard the balance of payments but by then the Eurobond market was so well established that New York was unable to regain a dominant international role.

London may have benefited from the early regulatory inflexibility of individual European countries but constant vigilance is required to fight off new threats. A swathe of directives from Brussels covering issue prospectuses, market abuse and investment services have awakened fears of tighter regulation.

'Europe is going through a legislative feeding frenzy,' said Richard Britton, a consultant to the International Securities Market Association. 'But it pays little attention to the fact that markets operate on a global scale. Almost half of Eurobond issues are from outside the European Union. If you impose strict regulations they could go elsewhere.'

## EXHIBIT 16.8 European issues go from strength to strength

Source: *Financial Times* 25 September 2003

Within these broad categories all kinds of ‘bells and whistles’ (features) can be attached to the bonds, for example *reverse floaters* – the coupon declines as LIBOR rises; *capped bonds* – the interest rate cannot rise above a certain level; *zero coupon* – a capital gain only is offered to the lender.

The majority of Eurobonds (more than 80 percent) are rated AAA or AA and denominations are usually \$1,000, \$5,000 or \$10,000 (or similar large sums in the currency of issue).

It is clear from Table 16.4 that corporations account for a relatively small proportion of the international bond market. The biggest issuers are the banks. Issues by governments (‘sovereign issues’) and state agencies in the public sector account for about one-fifth of issues. Also strongly represented are governments and international agencies such as the World Bank, the International Bank for Reconstruction and Development and the European Investment Bank.

**Corporations account for a relatively small proportion of the international bond market. The biggest issuers are the banks.**

**TABLE 16.4**  
**Issuers of international bond issues**

	Year		
	2001 \$bn	2002 \$bn	2003 (9 months) \$bn
Financial institutions	1,711	1,633	1,716
Corporate issuers	348	210	197
Governments	171	173	200
International organizations	75	84	83
<b>Total</b>	<b>2,305</b>	<b>2,100</b>	<b>2,195</b>

Source: Bank for International Settlements (BIS) *Quarterly Review*, www.BIS.org, December 2003

## Issuing Eurobonds

With Eurobonds a bank (lead manager or book runner) or group of banks acting for the issuer invite a large number of other banks or other investors to buy some of the bonds. The managing group of banks is responsible for underwriting the issue (guaranteeing to buy if no one else does) and it may enlist a number of smaller institutions to use their extensive contacts to sell the bonds – ‘the selling group’.

Eurobonds are traded on the secondary market through intermediaries acting as market makers who quote prices at which they are ready to buy or sell. Most Eurobonds are listed on the London or Luxembourg stock exchanges, but the market is primarily an over-the-counter one, that is, most transactions take place outside a recognized exchange. Deals are usually conducted using the telephone,

computers, telex and fax, rather than through a centralized trading place. It is not possible to go to a central source for price information. Most issues hardly ever trade, and those that do take place in private between the customer and the bond dealer – there is no obligation to inform the public about the deal. In 2000 the ISMA set up Coredeal, an electronic trading platform for 6,000 international securities, out of 16,000 in issue. It is in competition with many other recently created electronic platforms. The extent to which electronic platforms will replace telephone dealing is as yet unclear. Figure 16.5 presents the advantages and disadvantages of Eurobonds.

To conclude the discussion of Eurobonds we will consider a few examples and deal with some of the jargon.

**FIGURE 16.5**

**Advantages and drawbacks of Eurobonds as a source of finance for corporations**

<i>Advantage</i>	<i>Drawback</i>
1 Large loans for long periods are available.	1 Only for the largest companies – minimum realistic issue size is about £50m.
2 Often cheaper than domestic bonds. The finance provider receives the interest without tax deduction and retains anonymity and therefore supplies cheaper finance.	2 Bearer securities are attractive to thieves and therefore safe storage is needed.
3 Ability to hedge interest rate and exchange-rate risk.	3 Because interest and capital are paid in a foreign currency there is a risk that exchange-rate movements mean more of the home currency is required to buy the foreign currency than was anticipated.
4 The bonds are usually unsecured. The limitations placed on management are less than those for a secure bond.	4 The secondary market can be illiquid.
5 The lower level of regulation allows greater innovation and tailor-made financial instruments.	



From Tuesday to Friday, the *Financial Times* carries a small article giving a brief description of the new issues in the international bond market. The issues on Friday 16 January 2004 are described in Exhibit 16.9. Note that a 'sovereign issue' is a government borrowing; a 'transaction of £100m' is regarded as 'small'; not all bonds are sold at '100', i.e. par value (whether that be \$10,000 or £1,000, etc.); an 'inflation-linked' bond has a return that varies with published inflation numbers.

The Saturday edition of the *Financial Times* shows the 50 most liquid sterling denominated bonds – see Exhibit 16.10. About one-half are from government or quasi-government, the rest from UK corporations.

The *Financial Times* also publishes a table (Monday–Friday) showing a selection of secondary-market bid prices of actively traded international and emerging market bonds. This gives the reader some idea of current market conditions and rates of return demanded for bonds of different maturities, currencies and riskiness – see Exhibit 16.11.

## Car sector groups busy in wake of Daimler deal

Adrienne Roberts

More car sector names appeared on the bond market yesterday in the wake of DaimlerChrysler's deal earlier in the week, with small transactions from Toyota and BMW and an announcement by the luxury car-maker Porsche.

**BMW US Capital**, guaranteed by the German car-maker BMW, added \$100m to its outstanding 4.625 per cent 2006 bond. The issue, which carried an A1 rating from Moody's, was led by an ABN Amro and JP Morgan.

**Toyota Motor Credit Corporation**, rated triple-A by both Moody's and S&P, offered a €100m bond maturing in January 2008. UBS was sole lead.

In the pipeline, Porsche announced it had mandated Merrill Lynch and ABN Amro for a bond issue worth several hundred million dollars, to be placed with US private investors.

The German company, which has the highest profit margins in the auto sector, said the bond would be used for its long-term financing needs and would replace a €256m issue – nicknamed the 'SUV bond' – launched in 1998 to fund the development of its Cayenne sports-utility vehicle.

But Porsche said the new issue would not be used to fund the development of an updated version of its 911 sports car, widely expected later this year, or a possible fourth model range.

Elsewhere, the German chemical group **Bayer** sold a €460m, 3.75 per cent five-year bond through CSFB.

In the sovereign market, the French Treasury sold €4bn of 15-year inflation-linked bonds. The deal had been marketed at a minimum size of €3bn and increased to €4bn after the order book reached about €5.5bn.

'This deal fills the gap in the inflation-linked curve. France has supplied the 10-year sector and 30-year sector, and Italy did a good job supplying the five-year sector. The one missing benchmark point was the 15-year,' said Ziad Awad, syndicate manager at Goldman Sachs, which was joint lead manager with BNP Paribas, Deutsche Bank and Société Générale.

Money managers bought 31 per cent of the bonds, with pension and insurance companies taking up another 29 per cent. Central banks bought a relatively large 10 per cent of the issue.

## NEW INTERNATIONAL BOND ISSUES

Borrower	Amount m	Coupon %	Price	Maturity	Fees %	Spread bp	Book-runner
■ US DOLLARS							
Sistema Capital SA(a)	350	8.875#	100.00	Jan 2011	undisc	–	CSFB
Excelcomindó Fin Co BV(b)	350	8.00#	99.495	Jan 2009	undisc	–	CSFB/M Stanley/UBS
Braskem SA	250	11.75#	100.00	Jan 2014	undisc	+775(4 $\frac{1}{4}$ Nov13)	CSFB/UBS Inv'tment Bank
Banco Bradesco SA*	100	3.625#(s)	99.93	Jan 2007	0.35	+155(2 $\frac{5}{8}$ Nov06)	BNP Paribas
■ EUROS(e)							
Siena Migs 03-4 Srl,A1(c1)≠	220.4	(c1)	100.00	Sep 2005	undisc	–	M Stanley/MPS Finance
Siena Migs 03-4 Srl,A2(c2)≠	1.16bn	(c2)	100.00	Mar 2011	undisc	–	M Stanley/MPS Finance
BCP Finance Bank Ltd#	500	(d)	99.868	Feb 2009	0.15	–	BNPP/Deutsche Bank
Bradford & Bingley plc#	500	(g)	100.007	Jan 2009	0.15	–	ABN Amro/CSFB
Bayer Corporation	460	3.75	99.074	Jan 2009	undisc	+45(swaps)	CSFB
BFCM(h,S)≠	300	5.00	101.87	Sep 2015	0.40	+66.6(3 $\frac{3}{4}$ Jul13)	Royal Bank of Scotland
KBC Ifima NV#	300	(j)	100.054	Jan 2009	0.15	–	Lehman Brothers
Banco BPI SA(k)≠	250	(k1)	100.056	Jan 2007	0.125	–	Nomura International
Unibanca(m,S)≠	100	(m1)	99.646	Jan 2014	0.20	–	Banca IMI
Toyota Motor Credit Corp	100	2.375(l)	97.191	Jan 2008	0.20	–	UBS Investment Bank
■ STERLING							
BMW US Capital LLC(n)	100	4.625	99.417R	Dec 2006	0.20R	+38(7 $\frac{1}{2}$ Dec06)	ABN Amro/JP Morgan
ASIF III (Jersey) Ltd(o)	100	4.375	98.911	Dec 2008	1.875	–	RBC Capital Markets
■ YEN							
KBC Ifima NV#	21bn	(r)	100.02	Feb 2006	undisc	–	Nomura International
■ SWISS FRANCS							
ANZ Banking Group Ltd(t)	100	2.25	101.25	Dec 2008	0.25	+1(swaps)	BNP Paribas (Suisse)

Bond issue details are online at [www.ft.com/bondissues](http://www.ft.com/bondissues). Final terms, non-callable unless stated. Yield spread (over relevant government bond) at launch issued by lead manager. \*Unlisted. #Floating-rate note. #Semi-annual coupon. R: fixed re-offer price; fees shown at re-offer level. a) Puttable on 28/1/07 at par. b) Callable from 27/1/07 at 104 falling 2%pa to par. c) Secured on Italian residential mortgages originated by Banca MPS. Callable from 16/3/11 at par; if not called, coupon margins double. c1) Av life: 1.7 yrs. 3-mth Euribor +10bp. c2) Av life: 5.6 yrs. 3-mth Euribor +23bp. c3) Also: Classes B of €51.4m and C of €36.7 m. d) 3-mth Euribor +15bp. e) Spreads relate to German govt bonds unless stated. g) 3-mth Euribor +15bp. h) Fungible with €500m. Plus 126 days accrued. j) 3-mth Euribor +10bp. k) Fungible with €250m. Plus 14 days accrued. k1) 3ME +12 $\frac{1}{2}$ bp. l) Long 1st. m) Callable from 30/1/09 at par. m1) 3-mth Euribor +60bp to 30/1/09, then +120bp. n) Fung with €250m. Plus 31 days accrued. o) Fung with €350m. Plus 29 days accrued. r) 3-mth Libor flat. s) Short 1st. t) Fung with SFr250m. Plus 58 days accrued. S) Subordinated.

Exhibit 16.9 Car sector groups busy in wake of Daimler deal

Source: Financial Times 16 January 2004

● Sterling bond prices

Issuer: Barclays  
 Coupon: 6.5  
 percent  
 Redemption date:  
 16.2.04

Issue	Fri price	Week chge	GRY	Inc yld	Moody rtg	S&P rtg	Issue size	Sprd to Gilts
EIB 7 8/12/03	100.00	0.00	0.00	0.00	Aaa	AAA	2100	-
Gecc 5 1/8 12/1/04	99.98	0.07	0.00	5.13	Aaa	AAA	1070	-403
Abbey Nat 5 1/4 12/1/04	100.03	0.12	3.77	5.25	Aa2	AA-	575	-26
Barclays 6 1/2 16/2/04	100.20	0.05	4.00	6.49	Aa1	AA	500	-2
RBS 6 5/8 2/3/04	100.33	-0.02	3.95	6.60	Aa1	AA	500	-8
Abbey Nat 6 1/2 5/3/04	100.35	-0.03	3.80	6.48	Aa2	AA-	650	-22
Lloyds 7 3/8 11/3/04	100.58	0.08	3.51	7.33	Aa1	AA-	400	-52
EIB 10 3/8 22/11/04	105.13	-0.06	4.19	9.87	Aaa	AAA	400	-
EIB 6 26/11/04	101.43	0.02	4.26	5.92	Aaa	AAA	2950	-
KFW 6 5/8 26/11/04	101.98	0.02	4.23	6.50	Aaa	AAA	450	-
World Bank 6 1/4 26/11/04	101.68	0.02	4.21	6.15	Aaa	AAA	400	-
Canada 6 1/4 26/11/04	101.65	0.05	4.24	6.15	Aaa	AAA	500	-
Ford 7 1/4 05	102.23	0.47	5.11	7.09	A3	BBB-	300	93
BMW 6 1/8 05	102.83	0.32	4.52	5.96	A1		150	33
Glaxo 8 3/4 1/12/05	107.45	0.25	4.52	8.14	Aa2	AA	500	33
EIB 6 1/8 7/12/05	103.10	0.27	4.38	5.94	Aaa	AAA	1750	19
NAT Grid 8 29/3/2006	106.35	0.25	4.88	7.52	A1	A	240	47
BT 12 1/4 06	115.10	0.20	4.95	10.64		A-	329	54
Halifax 8 3/4 10/7/06	108.88	0.34	4.86	8.04	Aa3	AA-	400	45
EIB 7 5/8 7/12/06	108.00	0.32	4.61	7.06	Aaa	AAA	1550	20
Daimler 7 1/2 06	105.60	0.37	5.36	7.10	A3	BBB	350	95
Carlton 7 5/8 07	106.70	0.57	5.40	7.15	Baa3	BBB-	200	88
Lloyds 7 3/4 18/6/07	108.78	0.40	4.89	7.12	Aa1	AA-	300	38

Bond price with  
 par value set at  
 100

Gross (before deduction of tax) redemption yield

Issue	Fri price	Week chge	GRY	Inc yld	Moody rtg	S&P rtg	Issue size	Sprd to Gilt	Income yield (interest yield)
World Bank 7 1/8 30/7/07	107.75	0.42	4.69	6.61	Aaa	AAA	675	17	Credit rating
Tesco 7 1/2 07	107.80	0.52	5.03	6.96	A1	AAA	325	51	
BNG 7 3/8 6/8/07	108.35	0.45	4.76	6.81	Aaa	AAA	865	24	Amount issued in million of pounds
EN 7 5/8 7/12/07	109.83	0.14	4.80	6.94	Aaa	AAA	950	28	
Toyota 6 1/4 07	105.35	0.55	4.71	5.93	Aaa	AAA	250	20	Spread to government bond rate (gilt). The extent to which the rate of interest (GRY) is greater than that on a UK government bond of the same length of time to maturity (in this case 0.84%)
Halifax 6 3/8 3/4/08	105.33	0.49	4.94	6.05	Aa2	AA	450	44	
BG Transco 8 7/8 08	114.50	0.55	5.16	7.75	A2	A	250	66	Amount issued in million of pounds
Hilton 7 1/4 08	106.65	0.55	5.54	6.80	Baa2	A	175	104	
EIB 6 1/4 7/12/08	106.33	0.59	4.77	5.88	Aaa	AAA	1300	27	Amount issued in million of pounds
Pru 5 1/2 09	101.68	0.62	5.13	5.41	Aaa	AAA	250	60	
Boots 5 1/2 09	102.43	0.58	4.97	5.37	A1	A+	300	44	Amount issued in million of pounds
EIB 5 1/2 7/12/09	103.43	0.77	4.82	5.32	Aaa	AAA	2300	29	
World Bank 5 3/4 7/12/09	104.60	0.77	4.83	5.50	Aaa	AAA	400	31	Amount issued in million of pounds
EIB 9 1/2 9/12/09	123.80	0.82	4.82	7.67	Aaa	AAA	500	29	
Scot Pwr 6 5/8 10	107.53	0.58	5.14	6.16	A2	A-	200	61	Amount issued in million of pounds
Tesco 6 5/8 10	108.35	0.80	5.12	6.11	A1	A-	150	60	
EIB 6 1/4 15/4/14	110.28	1.38	4.94	5.67	Aaa	AAA	1500	27	Amount issued in million of pounds
Safeway 6 1/2 14	107.63	1.64	5.52	6.04	Baa1	BBB+	1500	27	
EIB 8 3/4 25/8/17	136.80	1.77	4.96	6.40	Aaa	AAA	1000	27	Amount issued in million of pounds
Halifax 9 3/8 15/5/21	145.80	1.87	5.27	6.43	Aa3	AA-	500	59	
EIB 5 3/8 7/6/21	104.60	1.77	4.97	5.14	Aaa	AAA	1875	28	Amount issued in million of pounds
Italy 6 4/8/28	113.10	2.00	5.05	5.31	Aa2	AA	1500	42	
EIB 6 7/12/28	115.60	2.35	4.90	5.19	Aaa	AAA	3600	27	Amount issued in million of pounds

Latest prices for Friday 9th January. Bonds shown are a selection of those available on the Bondscape service. GRY Gross redemption yield. Source: Bondscape

Exhibit 16.10 Sterling bond prices

Source: Financial Times 10/11 January 2004

## GLOBAL INVESTMENT GRADE

Jan 13	Red date	Coupon	S&P* Rating	Moody's Rating	Bid price	Bid yield	Day's chge yield	Mth's chge yield	Spread vs Govts
■ US \$									
Conoco Inc	04/04	5.90	A-	A3	101.1410	1.25	-0.02	-0.14	+0.01
IBRD	04/04	4.75	AAA	Aaa	101.1300	0.82	-0.34	-0.23	-0.08
Ford Motor Cr	02/06	6.88	BBB-	A3	106.7600	3.42	-0.08	-0.33	+1.79
Walt Disney	03/06	6.75	BBB+	Baa1	109.4700	2.32	-0.02	-0.37	+0.65
Morgan Stanley	04/06	6.10	A+	Aa3	108.1200	2.37	-0.03	-0.25	+0.74
American Elec	05/06	6.13	BBB	Baa3	107.8580	2.63	-0.02	-0.28	+0.55
FHLMC	07/06	5.50	AAA	Aaa	108.1100	2.15	-0.05	-0.24	+0.09
Canada	11/08	5.25	AAA	Aaa	109.8000	3.04	-0.05	-0.22	+0.02
Wal Mart	08/09	6.88	AAA	Aa2	116.2170	3.63	-0.02	-0.23	+0.47
Du Pont	10/09	6.88	AA-	Aa3	115.9570	3.76	-0.02	-0.11	+0.45
Phillips Petr	05/10	8.75	A-	A3	126.1700	4.04	-0.02	-0.19	+0.59
Unilever	11/10	7.13	A+	A1	116.7400	4.26	+0.03	-0.11	+1.24
Bank America	01/11	7.40	A	Aa3	117.6400	4.44	-0.15	-0.24	+1.39
JP Morgan	02/11	6.75	A	A2	112.8000	4.60	-	-0.17	+1.55
France Telecom	03/11	9.00	BBB	Baa3	121.2900	5.36	+0.03	-0.31	+2.33
FNMA	03/31	6.75	AAA	Aaa	117.6400	5.49	-0.01	-0.14	+0.51
Goldman Sachs	11/14	5.50	A+	Aa3	103.3900	5.09	-	-0.17	+0.99
Italy	09/23	6.88	AA	Aa2	119.6600	5.26	+0.01	-0.10	+0.28
Pacific Bell	03/26	7.13	A+	A1	112.7780	6.07	-0.01	-0.04	+1.10
Lockheed	12/29	8.50	BBB	Baa2	132.5970	6.00	-	-0.15	+1.02
Daimler Chrysler	01/31	8.50	BBB	A3	120.4600	6.83	-0.05	-0.38	+1.85
FHLMC	03/31	6.75	AAA	Aaa	117.6200	5.49	-0.11	-0.18	+0.51
AOL	04/31	7.63	BBB+	Baa1	116.3790	6.35	+0.04	-0.25	+1.37
Gen Motors Acc	11/31	8.00	BBB	A3	113.1100	6.93	+0.01	+0.13	+1.95
■ €									
Hypothekenbank	01/04	3.25	AAA	Aa1	99.9930	3.77	-0.09	+1.50	+1.75
Ford Motor Cr	02/04	5.63	BBB-	A3	100.1100	3.09	+0.45	+0.06	+1.07
EIB	04/04	5.25	AAA	Aaa	100.7500	2.10	-0.03	-0.07	+0.09
Olivetti Fin	07/04	5.83	BBB+	Baa2	101.7400	2.47	-0.05	-0.06	+0.46
BNG	04/05	5.00	AAA	Aaa	103.3600	2.28	+0.01	-0.22	+0.20
BASF	07/05	5.75	AA-	Aa3	104.8500	2.45	+0.01	-0.24	+0.05
Deutsche Telec	07/06	6.38	BBB+	Baa3	107.4500	3.20	+0.04	-0.26	+0.55
Eurohypo	02/07	4.00	AAA	Aaa	102.9900	2.96	+0.02	-0.24	+0.31
Depfa Pfandrnbk	01/09	3.75	AAA	Aaa	101.0900	3.51	+0.04	-0.22	+0.23
Mannesman Fin	05/09	4.75	A	A2	104.2100	3.86	+0.02	-0.27	+0.31
Deutsche Fin	07/09	4.25	AA-	Aa3	102.5700	3.72	-0.02	-0.20	+0.18
Repsol Int Fin	05/10	6.00	BBB	Baa2	109.0400	4.33	+0.03	-0.20	+0.58
Elec de France	10/10	5.75	AA-	Aa3	109.8800	4.05	+0.03	-0.21	+0.31
HVB	09/11	5.00	n/a	Aa3	105.6400	4.12	+0.02	-0.19	+0.21
■ YEN									
Nippon Teleg	03/06	3.35	AA-	Aa2	106.9297	0.15	-0.02	-0.04	-
Tokyo Elec	11/06	2.80	AA-	Aa3	107.2473	0.26	-0.03	-0.03	-
Toyota Motor	06/08	0.75	AAA	Aaa	100.8200	0.56	-0.01	-0.04	+0.17
KFW Int Fin	03/10	1.75	AAA	Aaa	105.8200	0.79	-0.01	-0.03	+0.04
Chubu Elec	07/15	3.40	AA-	Aa3	120.3921	1.35	-0.06	-0.05	-

Jan 13	Red date	Red Coupon	S&P* Rating	Moody's Rating	Bid price	Bid yield	Day's chge yield	Mth's chge yield	Spread vs Govts
■ £									
Gen Elec Cap	05/05	5.75	AAA	Aaa	101.7800	4.33	-0.01	-0.11	+0.17
DaimlerChrysler	12/06	7.50	BBB	A3	105.6200	5.34	-0.01	-0.11	+1.02
Halifax	04/08	6.38	AA	Aa2	105.4200	4.91	+0.02	-0.03	+0.45
Boots	05/09	5.50	n/a	A1	102.3000	4.99	-0.01	-0.09	+0.47
France Telecom	03/11	8.75	BBB	Baa3	114.2800	6.24	-	-0.09	+1.66
US \$ denominated bonds NY latest; all other London closing. * Standard & Poor's									
Source: Reuters									
<b>HIGH YIELD &amp; EMERGING MARKET BONDS</b>									
Jan 13	Red date	Red Coupon	S&P* Rating	Moody's Rating	Bid price	Bid yield	Day's chge yield	Mth's chge yield	Spread vs US
■ HIGH YIELD US\$									
Tyumen Oil	11/07	11.00	BB-	n/a	115.7500	6.28	+0.10	-0.55	+4.19
Gazinvest	10/08	7.25	n/a	Ba2	101.6300	6.84	+0.18	-0.37	+3.82
Gazprom	03/13	9.63	B+	n/a	114.0000	7.48	+0.09	-0.64	+3.38
Kazkommertsbk	04/13	8.50	BB-	n/a	108.0000	7.29	-0.34	-0.59	+3.20
■ HIGH YIELD €									
Messer	06/11	10.38	B+	n/a	115.2500	7.78	-0.04	+0.02	+3.89
Griesheim									
Invensys	04/05	5.50	B	Ba3	97.2800	7.91	-0.29	-0.39	+5.84

### Exhibit 16.11 Global investment grade

Source: *Financial Times* 14 January 2004

## Medium-term notes (MTNs)

By issuing a note a company promises to pay the holders a certain sum on the maturity date, and in many cases a coupon interest in the meantime. These instruments are unsecured and may carry floating or fixed interest rates. Medium-term notes (MTN) have been sold with a maturity of as little as nine months and as great as 30 years, so the word 'medium' is a little deceiving. They can be denominated in the domestic currency of the borrower (MTN) or in a foreign currency (Euro MTN). MTNs normally pay an interest rate above LIBOR, usually varying between 0.2 and 3 percent over LIBOR.

A MTN programme stretching over many years can be set up with one set of legal documents. Then, numerous notes can be issued under the program in future years. A program allows greater certainty that the firm will be able to issue an MTN when it needs the finance and allows issuers to by-pass the costly and time-consuming documentation associated with each stand-alone note (bond). The program can allow for

bonds of various qualities, maturities, currencies or type of interest (fixed or floating). Over the years the market can be tapped at short notice in the most suitable form at that time, e.g. US\$ rather than £, or redemption in three years rather than two. It is possible to sell in small denominations, e.g. \$5m, and on a continuous basis, regularly dripping bonds into the market. Banks charge a 'commitment fee' (around 10 to 15 basis points) for keeping open the option to borrow under an MTN programme, even if the company chooses not to do so in the end. Management fees will also be payable to the syndication of banks organizing the MTN facility.

## Commercial paper

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The issue and purchase of commercial paper is one means by which the largest commercial organizations can avoid paying the bank intermediary a middleman fee for linking borrower and lender. Commercial paper promises to the holder a sum of money to be paid in a few days. The lender buys these short-term IOUs, with an average life of about 40 days (normal range 30–90 days, but can be up to 270 days), and effectively lends money to the issuer. Normally these instruments are issued at a discount rather than the borrower being required to pay interest – thus the face value (amount paid on redemption) will be higher than the amount paid for the paper at issuance. Large corporations with temporary surpluses of cash are able to put that money to use by lending it directly to other commercial firms at a higher rate of effective interest than they might have received by depositing the funds in a bank.

This source of finance is usually only available to the most respected corporations with the highest credit ratings, as it is usually unsecured lending (no collateral), but there are occasional issues that offer security of a specific asset or a guarantee from a bank. Standard & Poor's and Moody's use a different grading system for short-term instruments (e.g. 'A-1' or 'P-1' are the highest ratings). The main buyers, such as money market mutual funds, are often restricted to having the bulk of their portfolios in the form of 'tier-one' rated issues – top ratings from credit rating agencies. Tier-two and tier-three issues do exist, but the demand is very limited.

While any one issue of commercial paper is short term it is possible to use this market as a medium-term source of finance by 'rolling over' issues. That is, as one issue matures another one is launched. A commercial paper program (a revolving underwriting facility) can be set up by a bank whereby the bank (or a syndicate of banks) underwrites a specified sum for a period of five to seven years. The borrower then draws on this every few weeks or months by the issue of commercial paper to other lenders. If there are no bids for the paper the underwriting bank(s) buys the paper at a specified price. Eurocommercial paper is issued and placed outside the jurisdiction of the country in whose currency it is denominated.

Companies need to be wary of being too reliant on commercial paper. A number have found their credit ratings lowered unexpectedly, making it impossible to obtain roll-over finance from the CP market, resulting in severe disruption to plans, and even to liquidation.

## Project finance

A typical project finance deal is created by an industrial corporation(s) providing some equity capital for a separate legal entity to be formed to build and operate a project, for example an oil pipeline, an electricity power plant. The project finance loan is then provided as bank loans or through bond issues direct to the separate entity. The significant feature is that the loan returns are tied to the cash flows and fortunes of a particular project rather than being secured against the parent firm's assets. For most ordinary loans the bank looks at the credit standing of the borrower when deciding terms and conditions. For project finance, while the parent company's (or companies') credit standing is a factor, the main focus is on the financial prospects of the project itself.

**For project finance the main focus is on the financial prospects of the project itself.**

To make use of project finance the project needs to be easily identifiable and separable from the rest of the company's activities so that its cash flows and assets can offer the lenders some separate security. Project finance has been used across the globe to finance power plants, roads, ports, sewage facilities and telecommunications networks. A few recent examples are given in Exhibit 16.12.

Project finance has grown rapidly over the last 25 years. Globally, about £50bn is lent in this form per year. A major stimulus has been the development of oil prospects. For the UK, the North Sea provided a number of project finance opportunities. Many of the small companies which developed fields and pipelines would not have been able to participate on the strength of their existing cash flow and balance sheet, but they were able to obtain project finance secured on the oil or fees they would later generate.

### Project finance has funded ...

#### **A telephone infrastructure**

In 2000 Hutchinson UK 3G raised £3bn by way of project finance to part-fund the building of the UK's fifth mobile network. This was three-year debt without recourse to shareholders.

#### **A copper mine**

In 2003 First Quantum Minerals used project finance to develop its Kinsanshi copper project in Zambia. US\$163m was needed.

#### **A power plant in Indonesia**

In 1994 banks lent the developers of the \$1.8bn Paton 1 power plant project

\$180m with no government guarantees, repayable over eight years at a rate of 2.25 percentage points over LIBOR.

#### **Electricity generating in Victoria**

In 1996 banks agreed to lend A\$2bn to PowerGen (the UK company) for the development of the coal-fired plant at Yallourn in Victoria, Australia despite the fact that there was no power purchase agreement in place – this is unusual as the lenders like to see reasonable certainty over the cash flows of the project before committing themselves. Here they are taking the risk that the price of electricity might fall.

### EXHIBIT 16.12 Project finance has funded

Source: Based on *Financial Times*, 21 August 1996, *Financial Times*, 27 October 2000, *Investors Chronicle* 28 March 2003



There is a spectrum of risk sharing in project finance deals. At one extreme there are projects where the parent firm (or firms) accept the responsibility of guaranteeing that the lenders will be paid in the event of the project producing insufficient cash flows. This is referred to as *recourse finance* because the lenders are able to seek the 'help' of the parent. At the other extreme, the lenders accept an agreement whereby, if the project is a failure, they will lose money and have no right of recourse to the parent company. If the project's cash flows are insufficient the lenders only have a claim on the assets of the project itself rather than on the sponsors or developers.

Between these two extremes there might be deals whereby the borrower takes the risk until the completion of the construction phase (for example, provides a completion guarantee) and the lender takes on the risk once the project is in the operational phase. Alternatively, the commercial firm may take some risks such as the risk of cost overruns and the lender takes others such as the risk of a government expropriating the project's assets.

The sums and size of projects are usually large and involve a high degree of complexity and this means high transaction and legal costs. Because of the additional risk to the lenders the interest rates charged tend to be higher than for conventional loans. Whereas a well-known highly creditworthy firm might pay 20 basis points (0.20 percent) over LIBOR for a 'normal' parent company loan, the project company might have to pay 100 basis points (1 percent) above LIBOR.

## Advantages of project finance

Project finance has a number of advantages.

1. *Transfer of risk* By making the project a stand-alone investment with its own financing, the parent can gain if it is successful and is somewhat insulated if it is a failure, in that other assets and cash flows may be protected from the effects of project losses. This may lead to a greater willingness to engage in more risky activities which may benefit both the firm and society. Of course, this benefit is of limited value if there are strong rights of recourse.
2. *Off-balance-sheet financing* The finance is raised on the project's assets and cash flows and therefore is not always recorded as debt in the parent company's balance sheet. This sort of off-balance-sheet financing is seen as a useful 'wheeze' or ploy by some managers – for example, gearing limits can be bypassed. However, experienced lenders and shareholders are not so easily fooled by accounting tricks.
3. *Political risk* If the project is in a country prone to political instability, with a tendency towards an anti-transnational business attitude and acts of appropriation, a more cautious way of proceeding may be to set up an arm's length (separate company) relationship with some risk being borne by the banking community, particularly banks in the host country. An example of this sort of risk is given in Exhibit 16.13.

4. *Simplifies the banking relationship* In cases where there are a number of parent companies, it can be easier to arrange finance for a separate project entity than to have to deal with each of the parent companies separately.

## Enron

In 1995 the state of Maharashtra in India suddenly revoked the contract it had with Enron for the construction of a power project, creating major problems for Enron and its bankers.

**EXHIBIT 16.13** ‘Regulatory risk’ exists in many parts of the world ...

## Sale and leaseback

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If a firm owns buildings, land or equipment it may be possible to sell these to another firm (for example a bank, insurance company or specialized leasing firm) and simultaneously agree to lease the property back for a stated period under specific terms. The seller receives cash immediately but is still able to use the asset. However the seller has created a regular cash flow liability for itself. For example in 2000 Abbey National, the mortgage bank, sold its branch network and its Baker Street head office (221b Baker Street – the home of Sherlock Holmes) totaling 6.5m sq.ft. The 722 branches and head office will be occupied by Abbey National under leases as short as one year, and as long as 20. The objective was to obtain flexibility in accommodation so that the bank can change with its customers and with the industry. It allowed the firm to ‘concentrate on banking rather than being property developers, which is not our job’ (John Price, Director of Property, *Financial Times*, 20 October 2000, p. 27).

**The seller receives cash immediately but is still able to use the asset.**

In 2003 Jarvis Hotels sold and leased back nine properties in a £150m deal. This followed British Telecommunications £2bn, 7,000-property deal with Land Securities. These deals release cash tied up in assets, allowing the firms to concentrate on what they regard as their core businesses. A number of retailers have used their extensive property assets for sale and leaseback transactions so that they could plow the proceeds into further expansion.

In many countries the tax regime encourages sale and leaseback transactions. For example, some property owners are unable to use depreciation and other tax allowances (usually because they do not have sufficient taxable profits). The sale of the asset to an organization looking to reduce taxable profits through the holding of depreciable assets enables both firms to benefit. Furthermore, the original owner’s subsequent lease payments are tax deductible.

A sale and leaseback has the drawback that the asset is no longer owned by the firm, so any capital appreciation has to be forgone. (However, clawback arrangements are possible, which allow the seller to receive a share of any increase in the value of the property, e.g. if say a factory site was granted planning permission for houses.) Also long lease arrangements of this kind usually provide for the rental payments to increase at regular intervals, such as every three or five years. There are other factors limiting the use of sale and leaseback as a financial tool. Leasing can involve complex documentation and large legal fees, which often make it uneconomic to arrange leases for less than £20m. There is also a degree of inflexibility: for example, unwinding the transaction if, say, the borrower wanted to move out of the property, can be expensive. Another disadvantage is that the property is no longer available to be offered as security for loans.

One of the attractions of sale and leaseback is the possibility of flattering the balance sheet. MG Rover, short of cash as a stand-alone company sold and leased back its famous Longbridge car plant in 2004 – *see* Exhibit 16.14.

Another advantage of sale and leaseback is that it makes managers more aware of the cost of holding property and can lead to greater efficiency – *see* Exhibit 16.15.

## MG Rover gains from Longbridge cash injection

John Griffiths

MG Rover is to receive a cash boost of £42.5m from a sale-and-leaseback deal for the Longbridge car plant, near Birmingham.

Under the deal, which covers 228 acres including most of MG Rover's production facilities, the carmaker has been granted a 35-year lease with an option to renew.

Both sides stressed yesterday that MG Rover's operations would continue unhampered but with provisions for the 'sensible release' of surplus land at MG Rover's option.

The carmaker, which employs 6,500, mainly at Longbridge, will use the proceeds mainly for product development.

MG Rover will pay £3.6m a year initially under the leaseback terms.

MG Rover, which lost £111m last year, urgently needs new vehicles to replace its ageing model range, in particular a car to replace its mid-sized Rover 45/MG ZS.

... Some 4.25m sq ft of buildings are covered by the leaseback. ...

... 'This deal generates cash for our cars business today and allows us to continue to invest in the car company's many product development activities,' said Kevin Howe, MG Rover chief executive. 'It puts to work one of our assets but in no way restricts the day-to-day running of the business.'

### EXHIBIT 16.14 MG Rover gains from Longbridge cash injection

Source: *Financial Times*, 7 January 2004

## Property leasing link with market return discovered

Juliana Ratner

Companies that lease some of their property have better shareholder returns, according to new research.

The study of more than 5,000 UK-listed companies from 1989 to 2002 showed that investment in companies that lease between 60 and 80 per cent of their property had a 71 per cent greater return than an investment in all the companies in the study.

Companies that lease 65 per cent of their real estate have the highest market-value-to-book-value ratio compared with those that lease all or own all of their property, according to a study by the Cass Business School in London, commissioned by Donaldsons, the property adviser.

The market appears to punish companies that own all of their property because too much capital is tied up in real estate,

and also does not favour those that lease all of their property, because landlords jump to the front of a queue in the event of bankruptcy, said Meziane Lasfer, professor of finance at Cass.

One of the more surprising results of the study is that companies that lease more property are more efficient, because they see their rental payments move through the profit and loss accounts and are more aware of their costs, Mr Lasfer said.

'Leased property is treated as an expense so companies try to wring maximum efficiencies from it to justify that expense,' said Keith Martin, head of corporate division at Donaldsons.

'All too often property owned by a company is taken for granted and treated as a free good.'

### EXHIBIT 16.15 Property leasing link with market return discovered

Source: *Financial Times* 3 May 2003

## Securitization

In the strange world of modern finance you sometimes need to ask yourself who ends up with your money when you pay your monthly mortgage, or your credit card bill or the instalment payment on your car. In the old days you would have found that it was the organization you originally borrowed from and whose name is at the top of the monthly statement. Today you cannot be so sure because there is now a thriving market in repackaged debt. In this market, a mortgage lender, for example, collects together a few thousand mortgage 'claims' it has (the right of the lender to receive regular interest and capital from the borrowers); it then sells those claims in a collective package to other institutions, or participants in the market generally. This permits the replacement of long-term assets with cash, improving liquidity and gearing, which can then be used to generate more mortgages. The borrower is often unaware that the mortgage is no longer owned by the original lender and everything appears as it did before, with the mortgage

**This permits the replacement of long-term assets with cash, improving liquidity and gearing.**

company acting as a collecting agent for the buyer of the mortgages. The mortgage company usually raises this cash by selling asset-backed securities to other institutions (the 'assets' are the claim on interest and capital) and so this form of finance is often called *asset securitization*. These asset-backed securities (ABS) may be bonds sold into a market with many players.

Asset backed securitization involves the pooling and repackaging of a relatively small, homogeneous and illiquid financial assets into liquid securities.

The sale of the financial claims can be either 'non-recourse', in which case the buyer of the securities from the mortgage firm bears the risk of non-payment by the borrowers, or with recourse to the mortgage lender.

Securitization has even reached the world of rock. Iron Maiden issued a long-dated \$30m asset-backed bond securitized on future earnings from royalties in 1999. It followed David Bowie's \$55m bond securitized on the income from his earlier albums and Rod Stewart's \$15.4m securitized loan from Nomura. Tussauds has securitized ticket and merchandise sales, Keele University has securitized the rental income from student accommodation and Newcastle United and Everton football clubs have securitized their future season ticket sales.

The innovation continues: The income from loans to Hong Kong taxi drivers worth HK\$3 billion were securitized in 2003, as were the cash flows from 502 UK funeral homes and 21 crematoriums (raising £210m).

This form of securitization is regarded as beneficial to the financial system, because it permits banks and other financial institutions to focus on those aspects of the lending process where they have a competitive edge. Some, for example, have a greater competitive advantage in originating loans than in funding them.

## Conclusion

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We covered debt finance described as short- and medium-term available to almost any firm in the previous chapter. Long-term debt finance has been thoroughly examined in this chapter together with financial market-based short- and medium-term finance. However the most important source of finance has only been touched on briefly so far, that is shareholders' ownership capital. The next chapter looks at the details of raising this type of capital from the stock market and in a variety of other ways.

Topics covered later in the book draw on the knowledge gained in this section of the book (Chapters 15, 16 and 17) to permit informed discussion of such crucial questions as: What is the appropriate mixture of debt and equity? How can the risk of certain forms of finance (for example a floating-interest-rate term loan) be reduced?

## Websites

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<a href="http://www.treasurers.org">www.treasurers.org</a>	Association of Corporate Treasurers
<a href="http://www.bankofengland.co.uk">www.bankofengland.co.uk</a>	Bank of England
<a href="http://www.economist.com">www.economist.com</a>	The Economist
<a href="http://www.FT.com">www.FT.com</a>	Financial Times
<a href="http://www.fitchibca.com">www.fitchibca.com</a>	Fitch IBCA
<a href="http://www.isma.co.uk">www.isma.co.uk</a>	International Securities Market Association
<a href="http://www.moody's.com">www.moody's.com</a>	Moody's
<a href="http://www.standardandpoors.com">www.standardandpoors.com</a>	Standard & Poor's

## Notes

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- 1 Quoted in the *Financial Times*, 23 December 2003, p. 21 Charles Batchelor 'Agencies under fresh pressure on rating worth'.
- 2 This example is designed to show the effect of leverage. It does lack realism in a number of respects; for example it is unlikely that profits will continue to rise at 25 percent per annum without further investment. This can be adjusted for – the time taken to pay off the debt lengthens but the principles behind the example do not alter.
- 3 This 7.25 percent is the nominal coupon rate. The actual rate of return Rank would have to pay in December 2003 on the issue of a new five-year bond was 6 percent.
- 4 Just to confuse everyone, the traders in these markets often refer all types of eurocurrencies, from eurosterling to euroyen generically as 'eurodollars', failing to reserve that title for US dollars.



## RAISING EQUITY CAPITAL

Introduction

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What is equity capital?

---

Preference shares

---

Floating on the Official List

---

What managers need to consider

---

Methods of issue

---

Timetable for a new offer

---

How does an alternative investment market flotation differ from one on the Official List?

---

The costs of new issues

---

Right issues

---

Other equity issues

---

Scrip issues

---

Warrants

---

Equity finance for unquoted firms

---

Disillusionment and dissatisfaction with quotation

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Conclusion

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Appendix 17.1 Arguments for and against floating

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## Case study 17.1

**To float or not to float? . . .****Some firms are keen to float on the London Stock Exchange . . .**

In 2000 easyJet set out its ambitious plans to grow seat capacity by 25% per year until it is the largest airline flying inside the European Union. It ordered new 737s with a list price of £890m. easyJet has to find a massive amount of money to fund its ambitions. With this in mind in November 2000 it sold 72.45 million new shares to outside investors and became listed on the Official List of the London Stock Exchange. The shares were priced at 310p and £195m was raised for the company. The new shares represented 27.8 percent of the enlarged equity capital. The remainder was held by easyJet's chairman, Stelios Haji-loannou, his brother and sister, Polys and Celia, and Ray Webster, the chief executive, who held 1.04 percent. Stelios Haji-loannou, the Greek entrepreneur, founded the airline in 1995 with backing from his father's shipping fortune.

**Some firms are desperate to leave the London Stock Exchange . . .**

Richard Branson, Alan Sugar, Andrew Lloyd Webber and Anita and Gordon Roddick have demonstrated deep dissatisfaction with their companies' quotation. Mr Branson floated the Virgin Group in 1986, then bought it back in 1988. Lord Lloyd Webber bought back his Really Useful Theatre Group in 1990 four years after floating. Alan Sugar had made plain his dislike of the City and its ways, and was particularly annoyed when investors rejected his 1992 offer to buy the Amstrad group for £175m. Anita Roddick, co-founder of Body Shop, which floated in 1984, for many years made no secret of her desire to free herself of the misunderstanding and constraints imposed by City Folk, who she once described as 'pin-striped dinosaurs'.

**And some firms are content to raise equity finance without being quoted on an exchange.**

Professor Steve Young, a specialist in information engineering at Cambridge University, became a millionaire by commercializing speech recognition software in the early 1990s. His project proceeded very nicely without a stock market quotation.

Initially his invention was licensed to a US company by Cambridge University. In 1995 the business was further developed by the creation of a UK company, half of which was owned by the US company. The other half was jointly held by the university, Professor Young and fellow academic Phil Woodland.

To grow further they needed 'venture money'. First, the US and UK companies combined and then the merged group took \$3m from Amadeus Capital Partners (venture capitalists). By 1999, with 60 staff, the company, Entropic, was in need of more equity capital. Venture capitalists offered \$20m, but here the story takes a strange twist. Young thought that it would be wise to have some of the shares bought by corporate investors. Microsoft was approached; they said they were not interested in making small corporate investments. A few weeks later, however, Microsoft telephoned and offered to buy the whole company instead. The deal is secret, but is thought to be worth tens of millions of pounds. Professor Young has returned to full-time academia a richer man and grateful for the existence of venture capital funds.

Sources: easyJet: based on *Financial Times*, 1, 9 and 16 November 2000 and 25 October 2000; Richard Branson, etc.: based on *Financial Times*, 1 November 1995 and 17 May 2000; Prof. Young: based on *Financial Times*, 14 June 2001.

## Introduction

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There are many ways of raising money by selling shares. This chapter looks at the most important. It considers the processes that a firm would have to go through to gain a quotation on the Official List (OL) and raise fresh equity finance. We will examine the tasks and responsibilities of the various advisers and other professionals who assist a company like easyJet to present itself to investors in a suitable fashion.

A firm wishing to become quoted may, in preference to the OL, choose to raise finance on the Alternative Investment Market (AIM), also run by the London Stock Exchange, where the regulations and the costs are lower.

In addition to, or as an alternative to, a 'new issue' on a stock market (also called an initial public offering, IPO), which usually involves raising finance by selling shares to a new group of shareholders, a company may make a rights issue, in which existing shareholders are invited to pay for new shares in proportion to their present holdings. This chapter explains the mechanics and technicalities of rights issues as well as some other methods, such as placings and open offers.

It is necessary to broaden our perspective beyond stock markets, to consider the equity finance-raising possibilities for firms that are not quoted on an exchange. There are over one million limited liability companies in the UK and only 0.2 percent of them have shares traded on the recognized exchanges. For decades there has been a perceived financing gap for small and medium-sized firms which has to a large extent been filled by the rapidly growing venture capital/private equity capital industry. Venture capital firms have supplied share and debt capital to thousands of companies on fast-growth trajectories, such as the company established by Professor Young.

**There are over one million limited liability companies in the UK and only 0.2 percent of them have shares traded on the recognized exchanges.**

Many, if not most, companies are content to grow without the aid of either stock markets or venture capital. For example JC Bamford (JCB), which manufactures earth-moving machines, has built a large, export award winning company, without needing to bring in outside shareholders. This contentedness and absence of a burning desire to be quoted is reinforced by the stories that have emerged of companies which became disillusioned with being quoted. The pressures and strains of being quoted are considered by some (for example, Philip Green, owner of Arcadia and BHS) to be an excessively high price to pay for access to equity finance. So to round off this chapter we examine some of the arguments advanced against gaining a quotation and contrast these with the arguments a growing company might make for joining a market.

## What is equity capital?

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### Ordinary shares

Ordinary shares represent the equity share capital of the firm. The holders of these securities share in the rising prosperity of a company. These investors, as owners of the firm, have the right to exercise control over the company. They can vote at shareholder meetings to determine such crucial matters as the composition of the team of directors. They can also approve or disapprove of major strategic and policy issues such as the type of activities that the firm might engage in, or the decision to merge with another firm. These ordinary shareholders have a right to receive a share of dividends distributed as well as, if the worst came to the worst, a right to share in the proceeds of a liquidation sale of the firm's assets. To exercise effective control over the firm the shareholders will need information; and while management are reluctant to put large amounts of commercially sensitive information which might be useful to competitors into the public domain, they are required to make available to each shareholder a copy of the annual report.

**Ordinary shares represent the equity share capital of the firm.**

There is no agreement between ordinary shareholders and the company that the investor will receive back the original capital invested. What ordinary shareholders receive depends on how well the company is managed. To regain invested funds an equity investor must either sell the shares to another investor (if the company is doing a share buy-back program, it might be possible to sell shares to it, but this is rare) or force the company into liquidation, in which case all assets are sold and the proceeds distributed. Both courses of action may leave the investor with less than originally invested. There is a high degree of discretion left to the directors in proposing an annual or semi-annual dividend, and individual shareholders are often effectively powerless to influence the income from a share – not only because of the risk attached to the trading profits which generate the resources for a dividend, but also because of the relative power of directors in a firm with a disparate or divided shareholder body.

Ordinary shareholders are the last in the queue to have their claims met. When the income for the year is being distributed others, such as debenture holders and preference shareholders, get paid first. If there is a surplus after that, then ordinary shareholders may receive a dividend. Also when a company is wound up, employees, tax authorities, trade creditors and lenders all come before ordinary shareholders. Given these disadvantages there must be a very attractive feature to ordinary shares to induce individuals to purchase and keep them. The attraction is that if the company does well there are no limits to the size of the claim equity shareholders have on profit. There have been numerous instances of investors placing modest sums into the shares of young firms who find themselves millionaires. For example, if you had bought £1,000 shares in Racal in 1961, by 1999 your holding would have been worth millions (Vodafone was one of Racal's creations).

From the company's point of view the issue of more shares has advantages, as discussed in Chapter 16, the most significant of which is their shock absorbing role. However, there are disadvantages compared with raising money by borrowing:

- *High cost* The cost of issuing shares is usually higher than the cost of raising the same amount of money by obtaining additional loans. There are two types of cost. First, there are the direct costs of issue such as the costs of advice from a merchant bank and/or broker, and the legal, accounting and prospectus costs, etc. These costs can absorb up to 10 percent of the amount of money raised. Second, and by far the most important, there is the cost represented by the return required to satisfy shareholders, which is greater than that on safer securities such as bonds issued by the firm (see Chapter 10).
- *Loss of control* Entrepreneurs sometimes have a difficult choice to make – they need additional equity finance for the business but dislike the notion of inviting external equity investors to buy shares. The choice is sometimes between slow/no growth or dilution of the entrepreneurs' control. External equity providers may impose conditions such as veto rights over important business decisions and the right to appoint a number of directors. In many instances, founders take the decision to forgo expansion in order to retain control.
- *Dividends cannot be used to reduce taxable profit* Dividends are paid out of after-tax earnings, whereas interest payments on loans are tax deductible. This affects the relative costs to the company of financing by issuing interest-based securities and financing through ordinary shares.

Entrepreneurs dislike the notion of inviting external equity investors to buy shares.

## Authorized, issued and par values

When a firm is created the original shareholders will decide the number of shares to be *authorized* (the *authorized capital*). This is the maximum amount of share capital that the company can issue (unless shareholders vote to change the limit). In many cases firms do not issue up to the amount specified. For example, Green plc has authorized capital of £5m, split between £1m of preference shares and £4m of ordinary shares. The company has issued all of the preference shares (at par) but the issued ordinary share capital is only £2.5m, leaving £1.5m as *authorized but unissued ordinary share capital*. This allows the directors to issue the remaining £1.5m of capital without the requirement of asking shareholders for further permission.

Authorized capital is the maximum amount of share capital that the company can issue.

Shares have a stated par value, say 25p or 5p. This nominal value usually bears no relation to the price at which the shares could be sold or their subsequent value on the stock market. So let us assume Green has ten million ordinary shares

issued, each with a par value of 25p (£2.5m total nominal value divided by the nominal price per share, 25p = 10m shares); these were originally sold for £2 each, raising £20m, and the present market value is £3.80 per share.

The par value has no real significance<sup>1</sup> and for the most part can be ignored. However, a point of confusion can arise when one examines company accounts

**Share premium account represents the difference between the price received by the company for the shares and the par value of those shares.**

because issued share capital appears on the balance sheet at par value and so often seems pathetically small. This item has to be read in conjunction with the *share premium account*, which represents the difference between the price received by the company for the shares and the par value of those shares.

Thus, in the case of Green the premium on each share was  $200p - 25p = 175p$ . The total share premium in the balance sheet will be £17.5m.

### Limited companies, plcs and listed companies

Limited liability means that the ordinary shareholders are only liable up to the amount they have invested or have promised to invest in purchasing shares. Lenders and other creditors are not able to turn to the ordinary shareholder should they find on a liquidation that the company, as a separate legal 'person', has insufficient assets to repay them in full. This contrasts with the position for a partner in a partnership who will be liable for all the debts of the business to the point where personal assets such as houses and cars can be seized to be sold to pay creditors.

Private companies, with the suffix 'Limited' or 'Ltd', are the most common form of company (over 95 percent of all companies). The less numerous, but more influential, form of company is a public limited company (or just public companies). These firms must display the suffix 'plc'. The private company has no minimum amount of share capital and there are restrictions on the type of purchaser who can be offered shares in the enterprise, whereas the plc has to have a minimum share capital of £50,000 but is able to offer shares to a wide range of potential investors. Not all public companies are quoted on a stock market. This can be particularly confusing when the press talks about a firm 'going public' – it may have been a public limited company for years and has merely decided to 'come to the market' to obtain a quotation. Strictly speaking, the term 'listed' should only be applied to those firms on the Official List but the term is used rather loosely and shares on the Alternative Investment Market are often referred to as being quoted or listed.

### Preference shares

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Preference shares usually offer their owners a fixed rate of dividend each year, unlike ordinary shares which offer no regular dividend. However if the firm has

insufficient profits the amount paid would be reduced, sometimes to zero. Thus, there is no guarantee that an annual income will be received, unlike with debt capital. The dividend on preference shares is paid before anything is paid out to ordinary shareholders – indeed, after the preference dividend obligation has been met there may be nothing left for ordinary shareholders. Preference shares are attractive to some investors because they offer a regular income at a higher rate of return than that available on fixed interest securities, e.g. bonds. However this higher return also comes with higher risk, as the preference dividend ranks after bond interest, and upon liquidation preference holders are further back in the queue as recipients of the proceeds of asset sell-offs.

Preference shares are part of shareholders' funds but are not equity share capital. The holders are not usually able to benefit from any extraordinarily good performance of the firm – any profits above expectations go to the ordinary shareholders. Also preference shares usually carry no voting rights, except if the dividend is in arrears or in the case of liquidation.

Figure 17.1 shows the basic division of shareholder funds.

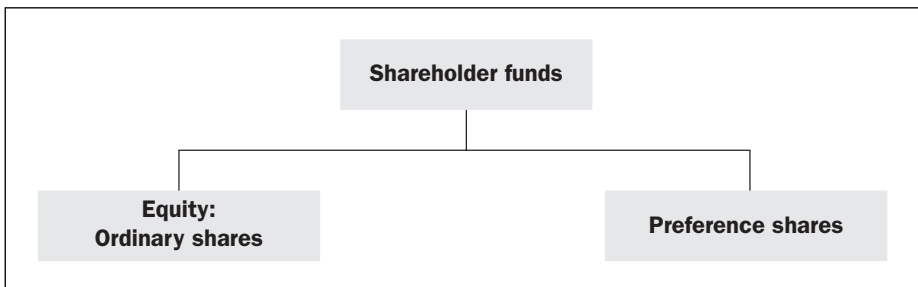
### Advantages to the firm of preference share capital

Preference share capital has the following advantages:

- *Dividend 'optional'* Preference dividends can be omitted for one or more years. This can give the directors more flexibility and a greater chance of surviving a downturn in trading. Although there may be no legal obligation to pay a dividend every year the financial community is likely to take a dim view of a firm that missed a dividend – this may have a deleterious effect on the ordinary share price as investors become nervous and sell.
- *Influence over management* Preference shares are an additional source of capital which, because they do not (usually) confer voting rights, do not dilute the influence of the ordinary shareholders on the firm's direction.
- *Extraordinary profits* The limits placed on the return to preference shareholders means that the ordinary shareholders receive all the extraordinary profits when the firm is doing well.

**FIGURE 17.1**

#### Shareholder funds



- *Financial gearing considerations* There are limits to safe levels of borrowing. Preference shares are an alternative, if less effective, shock absorber to ordinary shares because of the possibility of avoiding the annual cash outflow due on dividends. In some circumstances a firm may be prevented from raising finance by borrowing as this increases the risk of financial distress, and the shareholders may be unwilling to provide more equity risk capital. If this firm is determined to grow by raising external finance, preference shares are one option.

### Disadvantages to the firm of preference share capital

Preference share capital also has disadvantages:

- *High cost of capital* The higher risk attached to the annual returns and capital cause preference shareholders to demand a higher level of return than debt holders.
- *Dividends are not tax deductible* Because preference shares are regarded as part of shareholders' funds the dividend is regarded as an appropriation of profits. Tax is payable on the firm's profit before the deduction of the preference dividend. In contrast, lenders are not regarded as having any ownership rights and interest has to be paid whether or not a profit is made. This cost is regarded as a legitimate expense reducing taxable profit. In recent years preference shares have become a relatively unpopular method of raising finance because bonds and bank loans, rival types of long-term finance, have this tax advantage. This is illustrated by the example of companies A and B. Both firms have raised £1m, but Company A sold bonds yielding 8 percent, Company B sold preference shares offering a dividend yield of 8 percent. (Here we assume the returns are identical for illustration purposes – in reality the return on preference shares might be a few percentage points higher than that on bonds.) See Figure 17.2.

**FIGURE 17.2**  
Preference shares versus bonds

	Company A	Company B
Profits before tax, dividends and interest	200,000	200,000
Interest payable on bonds	80,000	0
Taxable profit	120,000	200,000
Tax payable @ 30% of taxable profit	36,000	60,000
	84,000	140,000
Preference dividend	0	80,000
Available for ordinary shareholders	84,000	60,000

Company A has a lower tax bill because its bond interest is used to reduce taxable profit, resulting in an extra £24,000 (£84,000 – £60,000) being available for the ordinary shareholders.

## Types of preference shares

There are a number of variations on the theme of preference share. Here are some features which can be added:

- *Cumulative* If dividends are missed in any year the right to eventually receive a dividend is carried forward. These prior-year dividends have to be paid before any payout to ordinary shareholders.
- *Participating* As well as the fixed payment, the dividend may be increased if the company has high profits.
- *Redeemable* These have a finite life, at the end of which the initial capital investment will be repaid. Irredeemables have no fixed redemption date.
- *Convertibles* These can be converted into ordinary shares at specific dates and on pre-set terms (for example, one ordinary share for every two preference shares). These shares often carry a lower yield since there is the attraction of a potentially large capital gain.
- *Variable rate* A variable dividend is paid. The rate may be linked to general interest rates, e.g. LIBOR or to some other variable factor.

## Floating on the Official List

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To 'go public' and become a listed company is a major step for a firm. The substantial sums of money involved can lead to a new, accelerated phase of business growth. Obtaining a quotation is not a step to be taken lightly; it is a major legal undertaking. The United Kingdom Listing Authority, UKLA (part of the Financial Services Authority)<sup>2</sup> rigorously enforces a set of demanding rules and the directors will be put under the strain of new and greater responsibilities both at the time of flotation and in subsequent years. As the example of Wolfson Microelectronics shows (*see* Exhibit 17.1), new issues can produce a greater availability of equity finance to fund expansion and development programs. It may also allow existing shareholders to realize a proportion of their investment. Shareholders benefit from the availability of a speedy, cheap secondary market if they want to sell. Not only do shareholders like to know that they can sell when they want to, they may simply want to know the value of their holdings even if they have no intention of selling at present. By contrast, an unquoted firm's shareholders often find it difficult to assess the value of their holding. In addition it can raise the profile of a

**Obtaining a quotation is not a step to be taken lightly; it is a major legal undertaking.**



company both in the financial world and in its product markets, which may give it a competitive edge. A float may also make mergers easier. This is especially true if the payment for the target shares is shares in the acquirer; a quoted share has a value defined by the market, whereas shares in unquoted companies are less attractive because of the greater doubt about the value.

## IPO to make millionaires of two academics

Chris Nuttall

Two Scottish academics are poised to become paper multi-millionaires when the technology company they founded is floated on the main London market next month.

Edinburgh-based Wolfson Microelectronics expects to raise £50m to £100m, in what would be the biggest initial public offering by a UK technology company in two and a half years.

The size of the stake to be sold has not yet been determined but could be as much as 25 per cent, giving the group a market capitalisation of at least £200m. ...

Wolfson makes chips for the computer and consumer electronics industries. Its products feature in Microsoft's Xbox games console, Apple's iPod music player and digital cameras, and DVD players and digital TVs. Its biggest customer, Hewlett-Packard, uses its chips in printers.

David Milne, chief executive, co-founded the company in 1984 when he was director of the Wolfson Microelec-

tronics Institute at Edinburgh University. Jim Reid, chief technical officer and the other co-founder, was also at the Wolfson and is visiting professor of engineering design at Glasgow university.

The pair own 6 per cent of the company but say they have no intention of cashing in on the IPO.

WestLB, the German bank, the Scottish Braveheart Ventures investment syndicate and Sanyo, Japanese electronics group, may sell part of their stakes in Wolfson. The group's 120 employees also have options that give them 20 per cent of the company.

Citigroup has been appointed sole bookrunner, with new and existing shares being offered to UK and overseas institutional investors. Citigroup and Cazenove will be lead managers and joint brokers.

Mr Milne said the flotation was aimed at improving Wolfson's balance sheet and expanding its product range.

### EXHIBIT 17.1 IPO to make millionaires of two academics

Source: *Financial Times* 9 September 2003

## What managers need to consider

### Prospectus

To create a stable market and encourage investors to place their money with companies the UKLA tries to minimize the risk of investing by ensuring that the firms which obtain a quotation abide by high standards and conform to strict rules. For example the directors are required to prepare a detailed prospectus ('Listing particulars') to inform potential shareholders about the company. This

may contain far more information about the firm than it has previously dared to put into the public domain. Even without the stringent conditions laid down by the UKLA the firm has an interest in producing a stylish and informative prospectus. A successful flotation can depend on the prospectus acting as a marketing tool as the firm attempts to persuade investors to apply for shares.

**A successful flotation can depend on the prospectus acting as a marketing tool.**

The content and accuracy of this vital document is the responsibility of the directors. Contained within it must be three years of audited accounts, details of indebtedness and a statement as to the adequacy of working capital. Statements by experts are often required: valuers may be needed to confirm the current value of property, engineers may be needed to state the viability of processes or machinery and accountants may be needed to comment on the profit figures. All major contracts entered into in the past two years will have to be detailed. Any persons with a shareholding of more than 3 percent have to be named. A mass of operational data is required, ranging from an analysis of sales by geographic area and category of activity, to information on research and development and significant investments in other companies.

### **Conditions imposed and new responsibilities**

All companies obtaining a full listing (i.e. on the Official List rather than the AIM) must ensure that at least 25 percent of their share capital is in public hands, to ensure that the shares are capable of being traded actively on the market. If a reasonably active secondary market is not established, trading may become stultified and the shares may become illiquid. 'Public' means people or organizations not associated with the directors or major shareholders.

Directors may find their room for discretion restricted when it comes to paying dividends. Stock market investors, particularly the major institutions, tend to demand regular dividends. Not only do they usually favor consistent cash flow, they also use dividend policy as a kind of barometer of corporate health (see Chapter 14). This can lead to pressure to maintain a growing dividend flow, which the unquoted firm may not experience.

There are strict rules concerning the buying and selling of the company's shares by its own directors. The Criminal Justice Act 1993 and the Model Code for Directors' Dealings have to be followed. Directors are prevented from dealing for a minimum period (normally two months) prior to an announcement of regularly recurring information such as annual results. They are also forbidden to deal before the announcement of matters of an exceptional nature involving unpublished information that is potentially price sensitive. These rules apply to any employee in possession of such information. All dealings in the company's shares by directors have to be reported to the market.

## You might be rejected as unsuitable

The UKLA tries to ensure that the 'quality of the company' is sufficiently high to appeal to the investment community. The management team must have the necessary range and depth, and there must be a high degree of continuity and stability of management over recent years. Investors do not like to be over-reliant on the talents of one individual and so will expect a team of able directors, including some non-executives, and – preferably – a separation of the roles of chief executive and chairman. They also expect to see an appropriately qualified finance director.

The UKLA usually insists that a company has a track record (in the form of accounting figures) stretching back at least three years. However this requirement has been relaxed since 1993 for scientific research-based companies and companies undertaking major capital projects. In the case of scientific research-based companies there is the requirement that they have been conducting their activity for three years even if no revenue was produced. Some major project companies, for example Eurotunnel, have been allowed to join the market despite an absence of a trading activity or a profit record.

Technologically oriented companies can be admitted to the techMARK, part of the Official List, with only one year of accounts so long as they have a market capitalization of at least £50m and are selling at least £20m of new or existing shares when floating.

Another suitability factor is the timing of the flotation. Investors often desire stability, a reasonable spread of activities and evidence of potential growth in the core business. If the underlying product market served by the firm is going through a turbulent period it may be wise to delay the flotation until investors can be reassured about the long-term viability. Firms are also considered unsuitable if there is a dominant controlling shareholder as this could lead the company into a conflict of interest with its responsibilities to other shareholders.

Other suitability factors are a healthy balance sheet, sufficient working capital, good financial control mechanisms and clear accounting policies.

## The issuing process

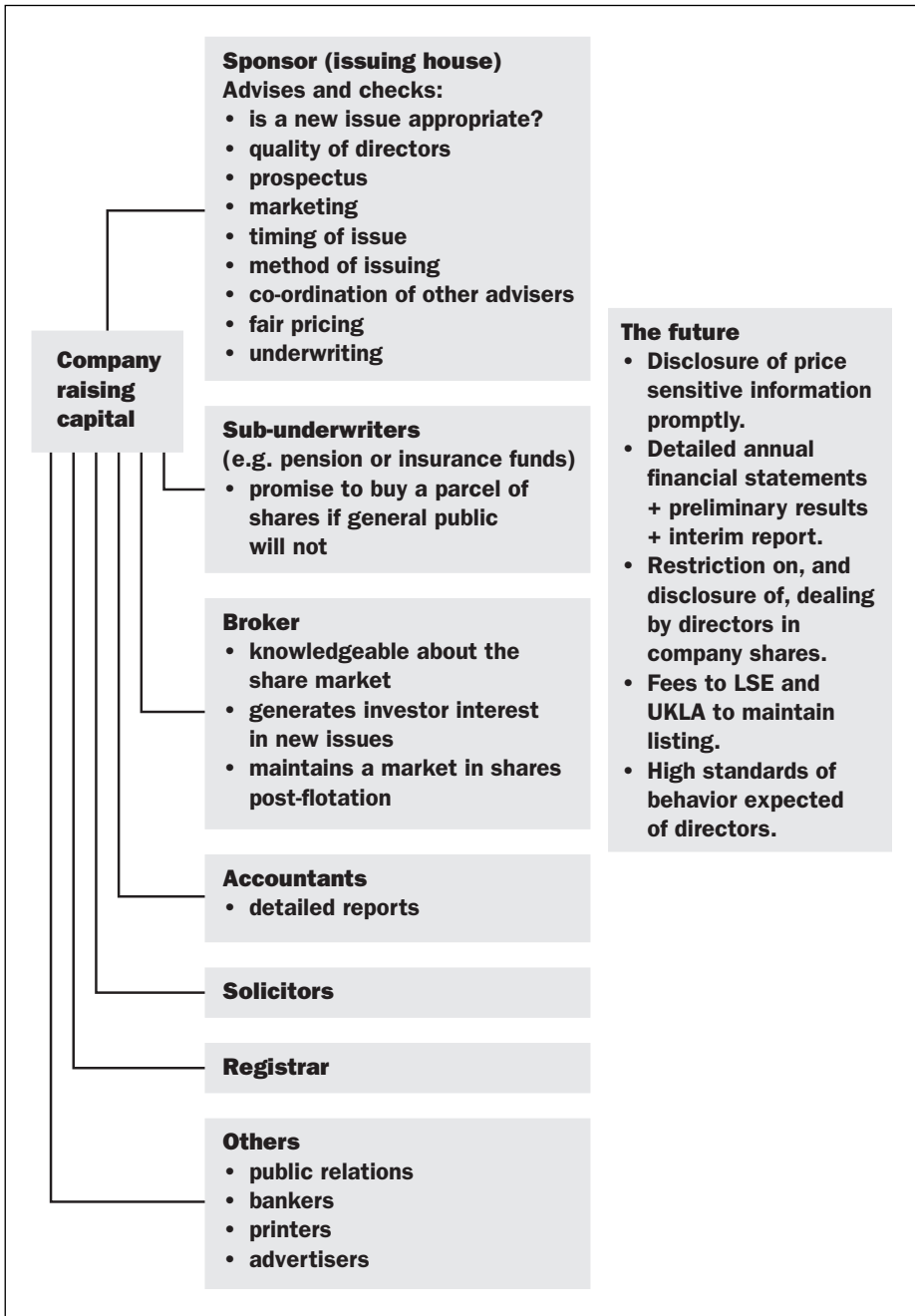
The issuing process involves a number of specialist advisers (discussed below). The process is summarized in Figure 17.3.

### Hiring a sponsor

Given the vast range of matters that directors have to consider to gain a place on the Official List (the 'main market') it is clear that experts are going to be required to guide firms through the complexities. The key adviser in a flotation is the sponsor. This may be a merchant bank, stockbroker or other professional adviser. Directors, particularly of small companies, often first seek advice from their existing professional advisers, for example accountants and solicitors. These may have the necessary expertise (and approval of the UKLA) themselves

FIGURE 17.3

## The issuing process for the Official List



to act for the company in the flotation or may be able to recommend a more suitable sponsor. Sponsors have to be chosen with care as the relationship is likely to be one that continues long after the flotation. For large or particularly complex issues investment banks are employed, although experienced stockbrokers have been used.

Sponsors are required by the UKLA to certify that a company has complied with all the regulatory requirements, and to ensure that all necessary documentation is filed in time. The sponsor (sometimes called the issuing house) will first examine the company to assess whether flotation is an appropriate corporate objective by taking into account its structure and capital needs. The sponsor will also comment on the composition of the board and the caliber of the directors. The sponsor may even recommend supplementation with additional directors if the existing team does not come up to the quality expected. The sponsor will draw up a timetable, which can be lengthy – sometimes the planning period for a successful flotation may extend over two years. There are various methods of floating, ranging from a placing to an offer for sale, and the sponsor will advise on the most appropriate. Another important function is to help draft the prospectus and provide input to the marketing strategy. Throughout the process of flotation there will be many other professional advisers involved and it is vital that their activities mesh into a coherent whole. It is the sponsor's responsibility to co-ordinate the activities of all the other professional advisers.

### **Paying underwriters**

Shortly before the flotation the sponsor will have the task of advising on the best price to ask for the shares, and, at the time of flotation, the sponsor will underwrite the issue. Most new issues are underwritten, because the correct pricing of a new issue of shares is extremely difficult. If the price is set too high, demand will be less than supply and not all the shares will be bought. The company is usually keen to have certainty that it will receive money from the issue so that it can plan ahead. To make sure it sells the shares it buys a kind

**The underwriter guarantees to buy the proportion of the issue not taken up by the market.**

of insurance called underwriting. In return for a fee the underwriter guarantees to buy the proportion of the issue not taken up by the market. A merchant bank sponsoring the issue will usually charge a fee of 2 percent of the issue proceeds and then pays part of that fee, say 1.25 percent of the issue proceeds, to sub-underwriters (usually large financial institutions such as pension funds) who each agree to buy a certain number of shares if called on to do so. In most cases the underwriters do not have to purchase any shares because the general public are keen to take them up. However occasionally they receive a shock and have to buy large quantities.

### **Hiring a corporate broker**

When a broker is employed as a sponsor the two roles can be combined. If the sponsor is, say, an investment bank the UKLA requires that a broker also be appointed. Brokers play a vital role in advising on share market conditions and the likely demand from investors for the company's shares. They also represent the company to investors to try to generate interest. When debating issues such as the method to be employed, the marketing strategy, the size of the issue, the timing or the pricing of the shares the company may value the market knowledge the broker has to offer. Brokers can also organize sub-underwriting and in the years following the flotation may work with the company to maintain a liquid and properly informed market in its shares.

### **Accountants and solicitors**

The reporting accountant in a flotation has to be different from the company's existing auditors, but can be a separate team in the same firm.

The accountant will be asked by the sponsor to prepare a detailed report on the firm's financial controls, track record, financing and forecasts (the 'long form' report). Not all of this information will be included in the prospectus but it does serve to reassure the sponsor that the company is suitable for flotation. Accountants may also have a role in tax planning both from the company's viewpoint and that of its shareholders. They also investigate working capital requirements. The UKLA insists that companies show that they have enough working capital for current needs and for at least the next 12 months.

All legal requirements in the flotation preparation and in the information displayed in the prospectus must be complied with. Examples of legal issues are directors' contracts, changes to the articles of association re-registering the company as a plc, underwriting agreements and share option schemes.

**Directors bear the ultimate responsibility for the truthfulness of the documents.**

Solicitors also prepare the 'verification' questions that are used to confirm that every statement in the prospectus can be justified as fact. Directors bear the ultimate responsibility for the truthfulness of the documents.

### **Registrars**

The records on the ownership of shares are maintained by registrars as shares are bought and sold. They keep the company's register and issue certificates. They are required to adjust records of ownership of company shares within two hours of a trade – electronic (rather than paper) records are now kept.

### **Continuing obligations after flotation**

The UKLA insists on listed companies having 'continuing obligations'. The intention is to ensure that all price-sensitive information is given to the market as soon as possible and that there is 'full and accurate disclosure'. Information is

price sensitive if it might influence the share price or the trading in the shares. Investors need to be sure that they are not disadvantaged by market distortions caused by some participants having the benefit of superior information. Public announcements will be required in a number of instances, for example: the development of major new products; the signing of major contracts; details of an acquisition; a sale of large assets; a change in directors; a decision to pay a dividend. The website [www.uk-wire.co.uk](http://www.uk-wire.co.uk) shows all major announcements made by companies going back many years.

Listed companies are also required to provide detailed financial statements within six months of the year-end. Firms usually choose to make preliminary profit announcements based on unaudited results for the year a few weeks before the audited results are published. Interim reports for the first half of each accounting year are also required (within four months of the end of the half year). The penalty for non-compliance is suspension from the exchange.

Other ongoing obligations include the need to inform the market about director dealings in the company's shares and the expectation that directors will conform to the standards of behavior required by the UKLA and the Exchange, some of which are contained in the Cadbury, Greenbury, Hempel and Hicks reports (now brought together in the Combined Code). While these standards of behavior are encouraged they are not required by the UKLA.

## Methods of issue

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The sponsor will look at the motives for wanting a quotation, at the amount of money that is to be raised, at the history and reputation of the firm and will then advise on the best method of issuing the shares. There are various methods, ranging from a full-scale offer for sale to a relatively simple introduction. The final choice often rests on the costs of the method of issue, which can vary considerably. There are five main methods.

### Offer for sale

The company sponsor offers shares to the public by inviting subscriptions from institutional and individual investors. Sometimes newspapers carry a prospectus and an application form. However, most investors will need to contact the sponsor or the broker to obtain an application form. (Publications, such as *Investors Chronicle*, show the telephone numbers to call for each company floating. Details of forthcoming flotations are available at [www.londonstockexchange.com/newissues](http://www.londonstockexchange.com/newissues), other useful websites are [www.hemscot.net](http://www.hemscot.net), [www.iii.co.uk/newissues](http://www.iii.co.uk/newissues) and [www.issuesdirect.com](http://www.issuesdirect.com)).

Normally the shares are offered at a fixed price determined by the company's directors and their financial advisers. A variation of this method is an *offer for sale by tender*. Here investors are invited to state a price at which they are will-

ing to buy (above a minimum reserve price). The sponsor gathers the applications and then selects a price which will dispose of all the shares – the strike price. Investors who bid a price above this will be allocated shares at the strike price – not at the price of their bid. Those who bid below the strike price will not receive any shares. This method is useful in situations where it is very difficult to value a company, for instance, where there is no comparable company already listed or where the level of demand may be difficult to assess. Leaving the pricing to the public may result in a larger sum being raised. On the other hand it is more costly to administer and many investors will be put off by being handed the onerous task of estimating the share's value.

**The sponsor selects a price which will dispose of all the shares – the strike price.**

## Introduction

Introductions do not raise any new money for the company. If the company's shares are already quoted on another stock exchange or there is a wide spread of shareholders, with more than 25 percent of the shares in public hands, the Exchange permits a company to be 'introduced' to the market. This method may allow companies trading on AIM to move up to the Official List or for foreign corporations to gain a London listing. This is the cheapest method of flotation since there are no underwriting costs and relatively small advertising expenditures. In 2004 ITV plc was introduced to the market. This company was created by merging Carlton with Granada, both of which had a wide spread of shareholdings and both were previously listed on the Exchange, so the company and its management were well known.

## Offer for subscription

An offer for subscription is similar to an offer for sale, but it is only partially underwritten. This method is used by new companies that state at the outset that if the share issue does not raise a certain minimum the offer will be aborted. This is a particularly popular method for new investment trusts.

## Placing

In a placing, shares are offered to the public but the term 'public' is narrowly defined. Instead of engaging in advertising to the population at large, the sponsor or broker handling the issue sells the shares to its own private clients – usually institutions such as pension and insurance funds. The costs of this method are considerably lower than those of an offer for sale. There are lower publicity costs and legal costs. A drawback of this method is that the spread of shareholders is going to be more limited. To alleviate this problem the Stock Exchange does insist on a large number of placees holding shares after the new issue.



In the 1980s the most frequently used method of new issue was the offer for sale. This ensured a wide spread of share ownership and thus a more liquid secondary market. It also permitted all investors to participate in new issues. Placings were only permitted for small offerings (< £15m) when the costs of an offer for sale would have been prohibitive. During the 1990s the rules were gradually relaxed so that any size of new issue could be placed. As this method is much cheaper and easier than an offer for sale, the majority of companies have naturally switched to placings.

### **Intermediaries offer**

Another method, which is often combined with a placing, is an intermediaries offer. Here the shares are offered for sale to financial institutions such as stock-brokers. Clients of these intermediaries can then apply to buy shares from them.

The Kier Group flotation, described in Exhibit 17.2, illustrates a number of points about new issues. First, note that in a new issue not all the shares sold come from the company itself. Frequently a high proportion (if not all) the shares are sold by the existing shareholders. Note also the motives for flotation: it will permit employees to sell their holdings at a later date should they wish and will also raise £2.7m to restructure its finances by redeeming preference shares. Staff who continue to hold shares will have the satisfaction of knowing the market price should they ever wish to sell in the future. The new issue comprises two parts: one is a sale to institutional investors through a placing and the second is an offer to sell more shares to employees.

### **Timetable for a new offer**

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The various stages of a new share issue will be explained using the example of the flotation of easyJet on the Official List. This timetable is set out in Figure 17.4.

#### **easyJet**

##### **Pre-launch publicity**

For many years before the flotation easyJet raised its profile with the public with exciting news stories. It even allowed a television company to make a fly-on-the-wall documentary about the firm's operations. This was shown weekly for many weeks, almost like a soap opera.

##### **Technicalities**

UBS Warburg and Credit Suisse First Boston were co-leading sponsors, with Merrill Lynch and Schroder Salomon Smith Barney assisting as co-managers. It was decided to float by way of a placing, so having many leading City institutions

## Float tag of 170p values Kier at £53.8m

Andrew Taylor

The value of employee shares in Kier Group, Britain's largest unquoted construction company, has increased tenfold since 1992, based on a flotation price, announced yesterday, which values the group at £53.8m.

The average employee investment of £4,800 is now worth £48,000 at the 170p a share price.

Kier is floating by way of a placing and employee offer.

The company was bought four years ago by its employees from Hanson, the UK conglomerate.

Kier is issuing 1.6m new ordinary shares to raise £2.7m in order to redeem preference shares held by Hill Samuel.

The balance of the preference shares is held by Electra Fleming, which is redeeming its holdings in return for ordinary shares. These, together with other

purchases, will leave Electra Fleming with a 9.8 per cent stake.

Employee shareholders representing 4.3 per cent of the enlarged capital have opted to sell their shares.

Staff, former employees and their families, however, would retain an 80.9 per cent stake in the company, said Mr Colin Busby, Kier's chairman and chief executive.

The placing price represented a multiple of about 11 times historic earnings per share of 15.5p in the 12 months to the end of June.

In that year, pre-tax profits increased 4 per cent to £7.3m (\$7m). Turnover was up from £585.7m to £614.6m.

A notional dividend of 6.5p for the year represents a yield of 4.8 per cent at the placing price.

### EXHIBIT 17.2 Float tag valuation

Source: *Financial Times*, 6 December 1996

managing the issue, with their extensive range of contacts with fund managers, was valuable. On 9 November a price range of 280p–340p was indicated. This was a narrowed range from that announced the previous week (250p–350p). By announcing a price range the sponsors and fund managers can gauge reaction from potential buyers before selecting the final single price.

It was decided that the company would sell 63 million shares (25.1 percent of the enlarged capital). A further 9.45 million shares were put aside for a 'green-shoe' or over-allotment issue. This means that the company reserved the right to sell these additional shares if there was sufficient demand. Doing so would raise the final free float (shares not associated with a connected person) to 27.8 percent of the enlarged capital. (These must be issued at the offer price within 30 days of the Official listing.)

During 2000 easyJet had been gathering a distinguished group of non-executive directors to supplement its board. They have the task of looking after the interests of *all* the shareholders. Tony Illsley, the former chief executive of Telewest Communications, was hired in May, Colin Day, chief financial officer of Reckitt Benckiser, was appointed in September and John Quelch, Dean of the London Business School, joined in November.

**FIGURE 17.4**  
**Timetable of an offer for sale and a placing**

<b>Time relative to Impact Day</b>	<b>Stage</b>	<b>Time</b>	<b>Event</b>
1-2 years	Pre-launch publicity.		
Several weeks	Sponsor and other advisers consider details such as price and method of issue. Also obtain underwriting, etc.	A few days	Pathfinder prospectus <ul style="list-style-type: none"> <li>• to Press;</li> <li>• to major investors.</li> </ul> No price.
		<b>IMPACT DAY</b>	Prospectus published. Price announced in a fixed-price sale offer or placing.
		A few days	Investors apply and send payments.
		2 days to 2 weeks for offer for sale	Allotment.
		2 weeks or so for an offer for sale	Admission to the Exchange and dealing begins.
<b>Dates for easyJet (placing)</b>		1998 to 2000	
		Late 2000	
		31 October: price range of 250p-350p is announced.	
		15 November: a price is given: 310p.	
		22 November: first dealings.	

During the period up to Impact Day the auditors were very busy and the sponsoring banks marketed the issue forcefully.

Auditors have been working hard to get the figures into shape for the prospectus, but in the meantime analysts from easyJet's heavyweight investment banks have been intensely marketing this research to institutional investors.

*(Financial Times, 25 October 2000, p. 3)*

It was decided that no shares were to be sold by existing shareholders.

### **Pathfinder prospectus**

The pathfinder prospectus is made available a few days before the sale. This contains background information on the company but does not tell potential investors the price at which the shares are to be offered. The pathfinder prospectus for easyJet this was sent out on 31 October.

### **Impact Day**

The prospectus is launched at this stage, together with the price. For easyJet the price was set at 310p, valuing the company at £778m.

### **Offer closes**

In an offer for sale up to two weeks is needed for investors to consider the offer price and send in payments. There is a fixed cut-off date for applications. In the case of a placing the time needed is much shorter as the share buyers have already indicated to the sponsors and managers their interest and transactions can be expedited between City institutions.

### **Allotment**

More shares were applied for than were available and so they had to be allocated. This can be achieved in a number of different ways. A ballot means that only some investors receive shares (recipients are selected at random). In a scale down applicants generally receive some shares, but fewer than they applied for. A cut-off point might be imposed in which applicants for large quantities are excluded. Money not used to buy shares is returned to investors. easyJet's share offer was over-subscribed by almost ten times. It is not clear how the available shares were allocated.

### **Dealing begins**

Formal dealing in the shares through the Stock Exchange started on 22 November for easyJet. The shares traded 10 percent above the placing price at 342p, giving investors an immediate profit.

## Book-building

Selling new issues of shares through book-building is a popular technique in the USA. It is starting to catch on in Europe as Exhibit 17.3 demonstrates. Under this method the financial advisers to an issue contact major institutional investors to get from them bids for the shares. The investors' orders are sorted according to price, quantity and other factors such as 'firmness' of bid. This data may then be used to establish a price for the issue and the allocation of shares. easyJet's sponsors used book-building (organized by a 'bookrunner').

### Booking the bids in the power sale

Conner Middelman

This morning at 8.30 precisely, a small room on the second floor of a City office building will erupt in a flurry of activity as the international sale of the government's remaining 40 per cent stake in the UK's two big power generators – National Power and PowerGen – kicks off.

The 'book-building room' – the nerve centre of the operation – resembles the bridge of the Starship Enterprise, with a wall of computer screens displaying colour graphics that chart the progress of the sale by the minute. Thick blinds shield the action from inquisitive eyes.

Share orders from institutional investors across the globe will arrive here over the next week, indicating how much money they are prepared to invest at specific prices. The book-building period for the £4bn sale, one of Europe's largest privatisations this year, ends on March 3 at 5pm. The international offer price and allocation will be agreed over the week-end, and trading in the partly-paid shares begins on March 6.

Book-building, which has been used in previous UK privatisations, allows the Treasury to compile a comprehensive picture of the strength of institutional demand for the shares over a range of prices. The aim is to ensure that the shares will be spread across a wide range of high-quality investors.

The share offer, totalling about £4bn, is structured in two parts: a UK public offer, targeted at UK retail investors, and two separate international tender offers (one for shares in National Power

and one for shares in PowerGen) aimed at institutional investors in the UK and around the world.

Roadshows for the international offer began last week, with both companies conducting separate roadshows in financial centres throughout Europe and the US.

The offers are being marketed through a syndicate of 17 investment banks with BZW and Kleinwort Benson acting as joint global co-ordinators and bookrunners.

The book-building process starts in the 'inputting room', where nine fax machines spew out forms detailing investors' orders. These show: how many shares in each company investors are willing to buy at what price, how much they would pay for a combination of shares in both at a ratio determined by the Treasury ('sector bid'), and whether the bid is firm or indicative.

The price and quality of investors' bids is crucial as it affects their final allocation. The Treasury will favour bids by investors considered to be likely buyers or holders of shares in the aftermarket; bids made at an early stage of the offer period; firm bids; bids at specific price levels (rather than market-relative or strike-price bids); and sector bids.

All the information is entered into a computer system by one of 15 input clerks and transmitted to the book-building room, where 24 screens throw up an instant graphic analysis of the data, highlighting strengths and weaknesses of distribution as the sale proceeds.

One monitor might show the build-up in demand for both companies over time. Another illustrates the value of demand at any given price. A pie chart represents the value of demand by country, and a bar chart shows it by syndicate member.

Yet another breaks down the orders into six different categories of investor quality, ranging from very serious, long-term investors to highly speculative accounts looking to play the deal over the very short term.

### EXHIBIT 17.3 Booking the bids in the power sale

Source: *Financial Times*, 23 February 1995

## How does an alternative investment market (AIM) flotation differ from one on the Official List?

The driving philosophy behind AIM is to offer young and developing companies access to new sources of finance, while providing investors with the opportunity to buy and sell shares in a trading environment run, regulated and marketed by the LSE. Efforts were made to keep the costs down and make the rules as simple as possible. In contrast to the OL there is no requirement for AIM companies to be a minimum size, to have traded for a minimum period or for a set proportion of their shares to be in public hands.

**There is no requirement for AIM companies to be a minimum size, to have traded for a minimum period or for a set proportion of their shares to be in public hands.**

Investors are reassured about the quality of companies coming to the market by the requirement that the floating firms have to appoint, and retain at all times, a nominated adviser and nominated broker. The nominated adviser ('nomad') is selected by the corporation from a Stock Exchange approved register of firms. The nominated advisers are paid a fee by the company to act as an unofficial 'sponsor' in investigating and verifying its financial health. These advisers have demonstrated to the Exchange that they have sufficient experience and qualifications to act as a 'quality controller', confirming to the LSE that the company has complied with the rules.

Nominated brokers have an important role to play in bringing buyers and sellers of shares together. Investors in the company are reassured that at least one broker is ready to trade or do its best to match up buyers and sellers. The adviser and broker are to be retained throughout the company's life in AIM. They have high reputations and it is regarded as a very bad sign if either of them abruptly refuses further association with a firm.

AIM companies are also expected to comply with strict rules regarding the publication of price-sensitive information and the quality of annual and interim reports. Upon flotation a detailed prospectus is required. This even goes so far as to state the directors' unspent convictions and all bankruptcies of companies where they were directors.

When the cost of the nominated advisers' time is added to those of the stock exchange fees, accountants, lawyers, printers and so on, the (administrative) cost of capital raising can be as much as 10–12 percent of the amount being raised. This, as a proportion, is comparable with the main market but the sums of money raised are usually much less on AIM and so the absolute cost is lower. AIM was designed so that the minimum cost of joining was in the region of £40,000–£50,000. But, as Exhibit 17.4 shows, it has now risen so that frequently more than £300,000 is paid. This sum is significantly higher than the originators of AIM

**AIM was designed so that the minimum cost of joining was in the region of £40,000–£50,000. It has now risen so that frequently more than £300,000 is paid.**

## Property flotation highlights AIM fees

Christopher Price

Concerns among smaller companies over the costs of joining the Alternative Investment Market are likely to be heightened by news that most of the £300,000 being raised by a property company is to be spent on fees for the junior market.

Advisers to Inner City Enterprises said the cost of joining AIM would exceed £200,000; prospective institutional shareholders have been told by the company the cost is nearer the total being raised.

The average cost of joining AIM varies widely, but basic fees for the nominated adviser, nominated broker, solicitor, accountants and public relations company rarely top £100,000. Additional charges are usually associated with the raising of capital.

A survey last week from Neville Russell, the accountants, found that 20 per cent of companies joining AIM paid between £100,000 and £200,000, while a quarter paid more than £300,000. All had raised funds as part of their admission. Companies paying less than £100,000 had generally not raised any.

A third of the companies surveyed said their flotations had caused 'significant disruption'. Estimates for 'hidden' costs ranged between £50,000 and £2m.

Mr Stephen Goschalk, a corporate

financier at English Trust, Inner City's adviser, said there were extenuating circumstances explaining the high costs it was incurring.

Among these were additional documentation required for its 60 existing institutional shareholders. Also, Inner City's property portfolio has had to be assessed and individually certified. However, both the company's adviser and Teather & Greenwood, its broker, said the costs were also a reflection of the rising price of joining AIM. 'Prices are going up because of pressure from the AIM authorities to tighten up on standards,' said Mr Ken Ford of Teather & Greenwood.

Last summer, AIM was hit by a series of corporate mishaps, such as profits warnings and delistings, which unnerved the authorities and led to monitoring of some advisers' behaviour. Under AIM rules, companies must retain a broker and an adviser. The latter has responsibility for a company's credentials in joining AIM and during membership.

'There is a move to improve standards and this has led to an increase in costs,' said Mr Goschalk. He added that the increases were such that it was uneconomical for a company with a market capitalisation of 'less than £7m' to come to the market.

### EXHIBIT 17.4 Property flotation highlights AIM fees

Source: *Financial Times* 3 February 1997

planned. Most of the additional cost arises on raising funds rather than simply joining AIM, which is around £100,000–£150,000. The nominated advisers argue that they are forced to charge firms higher fees because they incur more investigatory costs due to the emphasis put on their policing role by the Stock Exchange.

The prospectus (or AIM document) is less detailed than the prospectus for an OL quotation and therefore cheaper. The real cost savings come in the continuing annual expense of managing the quotation. For example AIM companies do not have to disclose as much information as companies on the Official List. Price-sensitive information has to be published but normally this will require only an electronic message from the adviser to the Exchange rather than a circular to shareholders.

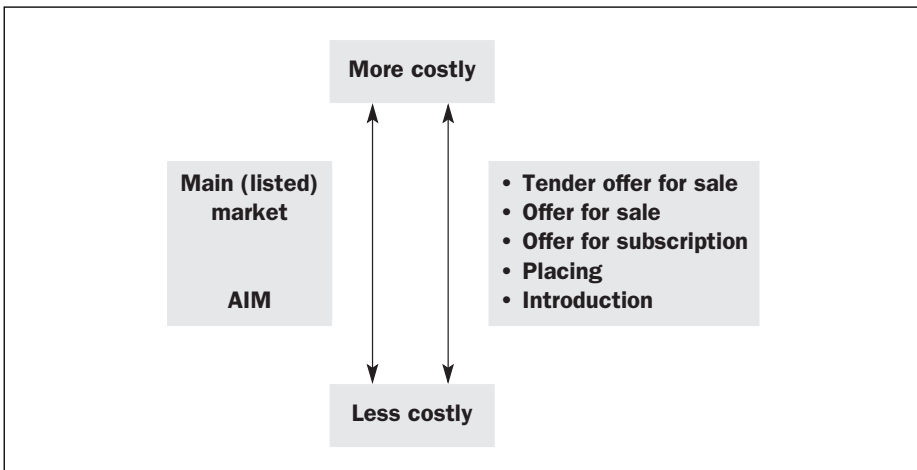
## The costs of new issues

There are three types of cost involved when a firm makes an issue of equity capital:

- administrative/transaction costs
- the equity cost of capital
- market pricing costs.

The first of these has already been discussed earlier in this chapter. For both the Official List and AIM the costs as a proportion of the amount raised can be anywhere between 5 and 12 percent depending on the size of issue, and the method used (*see* Figure 17.5).

**FIGURE 17.5**  
Costs of new issues





The second cost was discussed in more detail in Chapter 10. This relates to the investor's opportunity cost. By holding shares in one company shareholders give up the use of that money elsewhere. The firm therefore needs to produce a rate of return for those shareholders at least equal to the return they could obtain by investing in other shares of a similar risk class. Because ordinary shareholders face higher risks than debt or preference shareholders the rate of return demanded is higher. If the firm does not produce this return then shares will be sold and the firm will find raising capital difficult.

The market pricing cost is to do with the possibility of under-pricing new issues. It is a problem that particularly affects offers for sale at a fixed price and placings. The firm is usually keen to have the offer fully taken up by public investors. To have shares left with the underwriters gives the firm a bad image because it is perceived to have had an issue which 'flopped'. Furthermore, the

**The sponsoring organizations consist of people who are professional analysts and dealmakers and an issue which flops can be very bad for their image.**

underwriters, over the forthcoming months, will try to offload their shares and this action has the potential to depress the price for a long time. The sponsor also has an incentive to avoid leaving the underwriters with large blocks of shares. The sponsoring organizations consist of people who are professional analysts and dealmakers and an issue which flops can be very bad for their image. It might indicate that

they are not reading the market signals correctly and that they have overestimated demand. They might have done a poor job in assessing the firm's riskiness or failed to communicate its virtues to investors. These bad images can stick, so both the firm and the sponsor have an incentive to err on the side of caution and price a little lower to make sure that the issue will be fully subscribed. A major problem in establishing this discount is that in an offer for sale the firm has to decide the price one or two weeks before the close of the offer. In the period between Impact Day and first trading the market may decline dramatically. This makes potential investors nervous about committing themselves to a fixed price. To overcome this additional risk factor the issue price may have to be significantly less than the expected first day's trading price. Giving this discount to new shares deprives the firm of money which it might have received in the absence of these uncertainties, and can therefore be regarded as a cost. In the case of easyJet the shares moved to a first-day premium of 10 percent. It could be argued that the existing shareholders sold a piece of the business too cheaply at the issue price.

In addition to the issue costs there are also high costs of maintaining a listing – see Exhibit 17.5.

## Professional expenses prove a deterrent to maintaining stock market exposure

Bertrand Benoit

### But costs of public-to-private deals can also be considerable

Ask Richard Johnson, chief executive of Wyko, what the industrial distribution and maintenance group gained in 10 years on the stock market and the answer is likely to be short.

Launched with a market value of about £50m in 1989, the group was performing honorably until investors began to pull out from the small company sector last year.

In less than six months, its shares fell from 190p to 64p. 'This happened as we were considering a £60m acquisition,' Mr Johnson says. 'But with a p/e of 5, we had suddenly become vulnerable to a takeover.'

Unable to expand in a market where size increasingly mattered, Wyko put an end to its turbulent relationship with the Stock Exchange last week by going private in a management buy-out valuing it at £92.2m, a 30 per cent discount to its peak price.

This is not an isolated case. So far this year, nearly 40 companies have pulled out of the exchange, against 25 last year and a mere seven in 1997.

Some deals might have been sparked by the 10.5 per cent fall in the small cap index in 1998, against a 10.9 per cent gain in the FTSE All-Share. But the fact that small companies have outperformed bigger ones this year suggests some are no longer prepared to bear the cost and bother maintaining a listing.

Although linked to the size of the company, the expense typically amounts to £250,000 a year. Businesses meeting the minimum requirements imposed by the exchange pay a lot less. However, Roy Hill, chief executive of Liberfabrica, the book manufacturer bought by a trade buyer this month, claims his com-

pany will save up to £400,000 a year in City-associated costs.

These include fees paid to stockbroker, registrars, lawyers, merchant banker and financial PR company, as well as the exchange fee and the auditing, printing and distribution of accounts.

Another problem has been the low rating experienced by some of the smaller companies that have virtually disappeared from investors' radar screens. As institutions have grown increasingly reluctant to invest in small caps, brokers have stopped following many of them, thus hastening share price declines.

'Some institutions have stopped investing in companies with a market capitalisation below £100m,' says Penny Freer, head of smaller companies research at Crédit Lyonnais in London. 'Some smaller companies that deliver good results may end up with a single digit p/e.'

For Tony Fry, partner at KPMG Transaction Services, 'being on the stock market is all about getting access to funding, if you are barred from such access, then the attraction disappears'.

In addition to the venture capital funding that can facilitate acquisitions, managers have been lured into public-to-private deals by the chance of raising their stake in the business. In a typical MBO backed by a private equity house, managers can end up owning up to 20 per cent of the bidding vehicle. One banker calculates that the value of such a stake can grow 10 times if the company is later sold for twice the price of the buy-out.

But because MBOs are highly geared operations, the risks involved are equally considerable. The same managers could lose all their investment if

the company were sold below the original offer price.

Nor are the financial costs associated with a public-to-private transaction negligible. According to Richard Grainger, managing director at Close Brothers, the advisory firm, fees paid to bankers, registrars, venture capital funds and PR firms, can amount to 4 or 5 per cent of the purchase price.

The time spent in putting transactions together can also be consuming.

'The negotiations are so absorbing and involve so many parties that it can be very easy for management to take their eyes off the ball, especially if they do not have first class advisers,' says Mr Johnson, whose MBO of Wyko was concluded after seven months of talks.

In some instances, these efforts prove fruitless, as at Liberfabrica, whose management team was outbid by a trade buyer. Mr Hill reckons that £500,000 in fees was wasted in the exercise.

### The cost of listing

#### Estimated annual cost of listing for a company with a market capitalization of around £100m

Stockbroker	£20,000 to £25,000
Financial PR	£20,000 to £25,000
Financial reports and accounts	Around £30,000
Registrars	£5,000 to £25,000
High profile merchant bank	Around £50,000
Solicitors	Around £50,000
Other costs	Around £50,000
Total (per year)	£250,000 to £350,000

#### Estimated cost of going private for a company with a purchase price of around £100m

Advisers to the bidders	Around 1% of purchase price
Lawyers to the bidders	£100,000 to £200,000
Due diligence accountants	£100,000 to £400,000
Market report due diligence	£30,000 to £50,000
Stamp duty	Around 0.5% of purchase price
Printers	£15,000 to £20,000
Receiving banks	£10,000 to £15,000
Takeover panel fee	Around £25,000
Funders fee	2 to 3% of purchase price
Total	£3,780,000 to £5,210,000

Source: Industry estimates

### EXHIBIT 17.5 Professional expenses prove a deterrent

Source: *Financial Times* 31 August 1999

## Rights issues

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A rights issue is an invitation to existing shareholders to purchase additional shares in the company. This is a very popular method of raising new funds. It is easy and relatively cheap (compared with new issues). Directors are not required to seek the prior consent of shareholders, and the London Stock Exchange will only intervene in larger issues (to adjust the timing so that the market does not suffer from too many issues in one period). The UK has particularly strong traditions and laws concerning *pre-emption rights*. These require that a company raising new equity capital by selling shares first offers those shares to the existing shareholders. The owners of the company are entitled to subscribe for the new shares in proportion to their existing holding. This will enable them to maintain the existing percentage ownership of the company – the only difference is that each slice of the company cake is bigger because it has more financial resources under its control.

The shares are usually offered at a significantly discounted price from the trading price of the company's current shares – typically 10–20 percent. This gives the illusion that shareholders are getting a bargain. But, as we shall see, the benefit from the discount given is taken away by a decline in value of the old shares.

Shareholders can either buy these shares themselves or sell the 'right' to buy to another investor. For further reassurance that the firm will raise the anticipated finance, rights issues are usually underwritten by institutions.

### An example

Take the case of the imaginary listed company Swell plc with 100 million shares in issue. It wants to raise £25m for expansion but does not want to borrow it. Given that its existing shares are quoted on the stock market at 120p, the new rights shares will have to be issued at a lower price to appeal to shareholders because there is a risk of the market share price falling in the period between the announcement and the purchasing of new shares. (The offer must remain open for at least three weeks.) Swell has decided that the £25m will be obtained by issuing 25 million shares at 100p each. Thus the ratio of new shares to old is 25:100. In other words, this issue is a 'one-for-four' rights issue. Each shareholder will be offered one new share for every four already held.

If the market price before the rights issue is 120p valuing the entire company at £120m and another £25m is pumped into the company by selling 25 million shares at £1, it logically follows that the market price after the rights issue can not remain at 120p (assuming all else equal). A company that was previously valued at £120m which then adds £25m of value to itself (in form of cash) should be worth £145m. This company now has 125 million shares therefore each share is worth £1.16 (i.e. £145m divided by 125 million shares).

$$\frac{\text{Total market capitalization}}{\text{Total shares available}} = \frac{\text{£145m}}{125\text{m}} = \text{£1.16}$$

An alternative way of calculating the ex-rights price is as follows:

Four existing shares at a price of 120p	480p
One new share for cash at 100p	<u>100p</u>
Value of five shares	580p
Value of one share ex-rights $580p/5$	116p

The shareholders have experienced a decline in the price of their old shares from 120p to 116p. A fall of this magnitude necessarily follows from the introduction of new shares at a discounted price. However the loss is exactly offset by the gain in share value on the new rights issue shares. They cost 100p but have a market price of 116p. This can be illustrated through the example of Sid, who owned 100 shares worth £120 prior to the rights announcement. Sid loses £4 on the old shares – their value is now £116. However he makes a gain of £4 on the new shares.

Cost of rights shares ( $25 \times \pounds 1$ )	£25
Ex-rights value ( $25 \times \pounds 1$ )	<u>£29</u>
Gain	<u>£4</u>

When the press talks glibly of a rights offer being ‘very attractively priced for shareholders’ they are generally talking nonsense. Whatever the size of the discount the same value will be removed from the old shares to leave the shareholder no worse or better off. Logically value cannot be handed over to the shareholders from the size of the discount decision. Shareholders own all the company’s shares before and after the rights issue – they cannot hand value to themselves without also taking value from themselves. Of course, if the prospects for the company’s profits rise because it can now make brilliant capital expenditures, which lead to dominant market positions, then the value of shares will rise – for both the old and the new shares. But this is value creation that has nothing to do with the level of the discount.

### **What if a shareholder does not want to take up the rights?**

As owners of the firm all shareholders must be treated in the same way. To make sure that some shareholders do not lose out because they are unwilling or unable to buy more shares the law requires that shareholders have a third choice, other than to buy or not buy the new shares. This is to sell the rights on to someone else on the stock market (selling the rights nil paid). Take the case of impoverished Sid, who is unable to find the necessary £25. He could sell the rights to subscribe for the shares to another investor and not have to go through the process of taking up any of the shares himself. Indeed, so deeply enshrined are pre-emption rights that even if the shareholder does nothing the company will sell his rights to the new shares on his behalf and send the proceeds to him.

Thus, Sid would benefit to the extent of 16p per share or a total of £4 (if the market price stays constant) which adequately compensates for the loss on the 100 shares he holds. But the extent of his control over the company has been reduced – his percentage share of the votes has decreased.

The value of a right on one new share is:

$$\begin{aligned} \text{Theoretical market value of share ex-rights} - \text{Subscription price} \\ = 116\text{p} - 100\text{p} = 16\text{p} \end{aligned}$$

The value of a right on one old share in Swell is:

$$\begin{aligned} \frac{\text{Theoretical market value of share ex-rights} - \text{Subscription price}}{\text{No. of old shares required to purchase one new share}} \\ = \frac{116 - 100}{4} = 4\text{p} \end{aligned}$$

### Ex-rights and cum-rights

Shares bought in the stock market designated cum-rights carry with them to the new owner the right to subscribe for the new shares in the rights issue. After a cut-off date the shares go ex-rights, which means that any purchaser of old shares will not have the right to purchase the new shares.

### The price discount decision

It does not matter greatly whether Swell raises £25m on a one-for-four basis at 100p or on a one-for-three basis at 75p per share, or on some other basis (*see* Table 17.3).

**TABLE 17.3**  
**Comparison of different rights bases**

Rights basis	Number of new shares (m)	Price of new shares (p)	Total raised (£m)
1 for 4	25	100	25
1 for 3	33.3	75	25
1 for 2	50	50	25
1 for 1	100	25	25

As Table 17.3 shows, whatever the basis of the rights issue, the company will receive £25m and the shareholders will see the price of their old shares decrease, but this will be exactly offset by the value of the rights on the new shares. However, the ex-rights price will change. For a one-for-three basis it will be £108.75:

Three shares at 120p	360p
One share at 75p	75p
Value of four shares	<u>435p</u>
Value of one share (435/4)	108.75p

If Swell chose the one-for-one basis this would be regarded as a *deep-discounted rights issue*. With an issue of this sort there is only a minute probability that the market price will fall below the rights offer price and therefore there is almost complete certainty that the offer will be taken up. It seems reasonable to suggest that the underwriting service provided by the institutions is largely redundant here and that the firm can make a significant saving. Yet 95 percent of all rights issues are underwritten, usually involving between 100 and 400 sub-underwriters. The underwriting fees used to be a flat 2 percent of the offer. Of this the issuing house received 0.5 per cent, the broker received 0.25 percent and the sub-underwriter 1.25 percent (the same distribution as in a new issue). However, fees have fallen recently and can be as little as 0.75 per cent for low risk deep discounted issue.

## Other equity issues

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Some companies argue that the lengthy procedures and expense associated with rights issues (for example, a minimum three-week offer period) frustrate directors' efforts to take advantage of opportunities in a timely fashion. Firms in the USA have much more freedom to bypass pre-emption rights. They are able to sell blocks of shares to securities houses for distribution elsewhere in the market. This is fast and has low transaction costs. The worry for existing shareholders is that they could experience a dilution of their voting power and/or the share could be sold at such a low price that a portion of the firm is handed over to new shareholders too cheaply.

The UK authorities have produced a compromise. Here firms must obtain shareholders' approval through a special resolution (a majority of 75 percent of those voting) at the company's annual general meeting or at an extraordinary general meeting to waive the pre-emption right. Even then the shares must not be sold to outside investors at more than a 5 percent discount to the share price. This is an important condition. It does not make any difference to existing

**The shares must not be sold to outside investors at more than a 5 percent discount to the share price.**

shareholders if new shares are offered at a deep discount to the market price as long as they are offered to them. If external investors get a discount there is a transfer of value from the current shareholders to the new.

## Placings and open offers

In placings, new shares are sold directly to a narrow group of external investors. The institutions, wearing their hat of existing shareholders, have produced guidelines to prevent abuse, which normally only allow a placing of a small proportion of the company's capital (a maximum of 5 percent in a single year and no more than 7.5 percent is to be added to the company's equity capital over a rolling three-year period) in the absence of a *claw back*.

**With a claw back the issue becomes an 'open offer'.**

Under claw back existing shareholders have the right to reclaim the shares as though they were entitled to them under a rights issue. They can buy them at the price they were offered to the external investors. With a claw back the issue becomes an 'open offer'. The major difference compared with a rights issue is that if they do not exercise this claw back right they receive no compensation for a reduction in the price of their existing shares – there are no nil-paid rights to sell.

## Acquisition for shares

Shares are often issued to purchase businesses or assets. This is usually subject to shareholder approval.

## Vendor placing

If a company wishes to pay for an asset such as a subsidiary of another firm or an entire company with newly issued shares, but the vendor(s) does not want to hold the shares, the purchaser could arrange for the new shares to be bought by institutional investors for cash. In this way the buyer gets the asset, the vendors (for example shareholders in the target company in a merger or takeover) receive cash and the institutional investor makes an investment. There is usually a claw back arrangement for a vendor placing (if the issue is more than 10 percent of market capitalization of the acquirer). Again the price discount can be no more than 5 percent of the current share price.

## Bought deal

Instead of selling shares to investors companies are sometimes able to make an arrangement with a securities house whereby it buys all the shares being offered for cash. The securities house then sells the shares on to investors included in its distribution network, hoping to make a profit on the deal. Securities houses often compete to buy a package of shares from the company, with the highest bidder winning. The securities house takes the risk of being unable to sell the shares for at least the amount that they paid. Given that some of these bought deals are for over £100m, these securities houses need substantial capital backing. Bought deals are limited by the 5 percent pre-emption rules.



## Scrip issues

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Scrip issues do not raise new money: a company simply gives shareholders more shares in proportion to their existing holdings. The value of each shareholding does not change, because the share price drops in proportion to the additional shares. They are also known as capitalization issues or bonus issues. The purpose is to make shares more attractive by bringing

**British investors are thought to consider a share price of £10 and above as less marketable than one in single figures.**

down the price. British investors are thought to consider a share price of £10 and above as less marketable than one in single figures. So a company with shares trading at £15 on the Exchange might distribute two 'free' shares for every one held – a two-

for-one scrip issue. Since the amount of money in the firm and its economic potential is constant the share price will theoretically fall to £5.

A number of companies have an annual scrip issue while maintaining a constant dividend per share, effectively raising the level of profit distribution. For example,

**Scrip issues are often regarded as indicating confidence in future earnings increases.**

if a company pays a regular dividend of 20p per share but also has a one-for-ten scrip, the annual income will go up by 10 percent. (A holder of ten shares who previously received 200p now receives 220p on a holding of 11 shares.) Scrip issues are often regarded as indicat-

ing confidence in future earnings increases. If this new optimism is expressed in the share price it may not fall as much as theory would suggest.

Scrip dividends are slightly different: shareholders are offered a choice between receiving a cash dividend or receiving additional shares. This is more like a rights issue because the shareholders are making a cash sacrifice if they accept the scrip shares.

A *share split* (stock split) means that the nominal value of each share is reduced in proportion to the increase in the number of shares, so the total book value of shares remains the same. So, for example, a company may have one million shares in issue with a nominal value of 50p each. It issues a further one million shares to existing shareholders with the nominal value of each share reducing to 25p, but total nominal value remains at £500,000. Of course, the share price will halve – assuming all else is constant.

## Warrants

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Warrants give the holder the right to subscribe for a specified number of shares at a fixed price at some time in the future. If a company has shares currently trading at £3 it might choose to sell warrants, each of which grants the holder the right to buy a share at, say, £4 in five years. If by the fifth year the share price has risen to £6 the warrant holders could exercise their rights and then sell the shares immediately, realizing £2 per share, which is likely to be a consid-

erable return on the original warrant price of a few pence. Warrants are frequently attached to bonds, and make the bond more attractive because the investor benefits from a relatively safe (but low) income on the bond if the firm performs in a mediocre fashion, but if the firm does very well and the share price rises significantly the investor will participate in some of the extra returns through the ‘sweetener’ or ‘equity kicker’ provided by the warrant.

## Equity finance for unquoted firms

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We have looked at some of the details of raising money on the Stock Exchange. In the commercial world there are thousands of companies that do not have access to the Exchange. We now consider a few of the ways that unquoted firms can raise equity capital.

### Business angels (informal venture capitalists)

Business angels are wealthy individuals, generally with substantial business and entrepreneurial experience, who usually invest between £10,000 and £250,000 primarily in start-up, early stage or expanding firms. These companies will be years away from obtaining a market quotation for their shares and so, in becoming a business angel the investor accepts that it may be difficult to dispose of their shares even if the company is progressing nicely. They also accept a relatively high degree of risk of complete failure. But the upside, if all goes well, can be tremendous. Investors putting just a few thousand pounds in a small company have become very wealthy following the firm’s flotation, or when it is sold to another company. For example, Body Shop investor Mr Ian McGlenn was a garage owner who put £4,000 into Body Shop in 1976. He owned over one-quarter of the company’s shares which are now worth millions.

**Business angels are wealthy individuals, generally with substantial business and entrepreneurial experience.**

About three-quarters of business angel investments are for sums of less than £100,000 with the average investment around £25,000–£30,000. The majority of investments are in the form of equity finance but angels do purchase debt instruments and preference shares. They usually do not have a controlling shareholding and they are willing to invest at an earlier stage than most formal venture capitalists. (They often dislike the term business angel, preferring the title informal venture capitalist).

**Business angel prefer the title informal venture capitalist.**

They are generally looking for entrepreneurial companies with high aspirations and potential for growth. A typical business angel makes one or two investments in a three-year period, often in an investment syndicate (with an ‘archangel’ leading the group). They generally invest in companies within a reasonable traveling distance from their homes because most like to be ‘hands-on’ investors, playing a significant role in strategy and management – on average

angels allocate ten hours a week to their investments. Most angels take a seat on the board.<sup>3</sup> Business angels are patient investors willing to hold their investment for at least a five-year period.

The main way in which firms and angels find each other is through friends and business associates, although there are a number of formal networks. See British Venture Capital Association at [www.bvca.co.uk](http://www.bvca.co.uk) for a list of networks. Other useful contacts: National Business Angels Network (NBAN) [www.best-match.co.uk](http://www.best-match.co.uk) or [www.nban.com](http://www.nban.com). Angel Bourse, [www.angelbourse.com](http://www.angelbourse.com); Wave2, [www.wave2.org](http://www.wave2.org); Venture Capital Report, [www.vcr1978.com](http://www.vcr1978.com); Katalyst Ventures, [www.katalystventures.com](http://www.katalystventures.com); Hotbed, [www.hotbed.uk.com](http://www.hotbed.uk.com); Beer & Partners [www.beerandpartners.com](http://www.beerandpartners.com); Entrust, [www.entrust.co.uk](http://www.entrust.co.uk); Department of Trade and Industry, [www.dti.gov.uk](http://www.dti.gov.uk).

There are hundreds of groups of business angels throughout Europe. Exhibit 17.6 highlights some of the activity around Cambridge.

## Chance to save the most deserving

Phil Davis

A well-established group in Cambridge helps link investors and start-up companies in an unusual reversal of the usual process – by presenting young companies directly to investors through a kind of beauty contest.

The Great Eastern Investment Forum (GEIF), set up eight years ago by NW Brown, a Cambridge financial services firm, has a team of managers who sift through hundreds of business plans every year from start-ups seeking capital.

The best ones win the right to present their business to GEIF's 314-strong community, which comprises wealthy individuals, venture capitalists, corporate investors and professional advisers. The rapid-fire presentations, held four times a year, last 10 minutes, after which investors can talk at length with any company that has impressed them.

The process appeals to investors because of its transparency, but becoming a 'business angel' is only for the experienced, warns Nigel Brown, chairman of GEIF. 'The high-tech bubble made people think of quick, massive returns and that mentality remains.' ...

Derek Harris, a GEIF member with eight big investments to his name in a 20-year career as a business angel, takes his 'angel' responsibilities seriously ...

Harris likes to be fully involved as a director or chairman of companies he invests in, and is chairman of Coffee Nation, a vending machine company that has raised £240,000 since it first made a presentation at the GEIF. His motivation is the buzz of seeing a business grow, rather than his 'very modest' salary as chairman.

'It is good fun working with youngsters and providing a steady hand on the wheel,' Harris says. 'I hated office politics and big organisations that don't focus on markets and customers, so I would never go back to being a salaried employee.'

Companies approaching the GEIF for funding range from biotechnology and IT to engineering projects and restaurant groups.

*The Great Eastern Investment Forum at: [www.geif.co.uk](http://www.geif.co.uk)*

### EXHIBIT 17.6 Chance to save the most deserving

Source: *Financial Times* 13/14 September 2003

Angel network events are organized where entrepreneurs can make a pitch to potential investors, who, if they like what they hear in response to their questions, may put in tens of thousands of pounds. Prior to the event the network organizers (or a member) generally screen the business opportunities to avoid time wasting by the no-hopers. To be a member of a network investors are expected to either earn at least £100,000 per year or have a net worth of at least £250,000 (excluding main residence). If you have a specialist skill to offer, for example you are an experienced company director or chartered accountant, you may be permitted membership despite a lower income or net worth.

Many business angel deals are structured to take advantage of tax breaks such as those through enterprise investment schemes, EIS, which offer tax relief – see later in this chapter.

## Venture capital

There has been the rapid development of the venture capital industry over the past 20 years. Today over £6bn per year<sup>4</sup> is supplied by formal venture capital suppliers to unquoted UK firms compared with just a few million in the 1970s. The tremendous growth of venture capital has to a large extent plugged the ‘financing gap’, which so vexed politicians and business people alike in the 1970s and early 1980s. (The financing gap is the difficulty of finding finance for companies too big for the founders or banks to support growth and not ready for stock flotation.)

Venture capital funds provide finance for high-growth-potential unquoted firms. Venture capital is a medium- to long-term investment and can consist of a package of debt and equity finance. Venture capitalists take high risks by investing in the equity of young companies often with a limited (or no) track record. Many of their investments are into little more than a management team with a good idea – which may not have started selling a product or even developed a prototype. It is believed, as a rule of thumb in the venture capital industry, that out of ten investments two will fail completely, two will perform excellently and the remaining six will range from poor to very good.

**Out of ten investments two will fail completely, two will perform excellently.**

High risk goes with high return. Venture capitalists expect to get a return of between five and ten times their initial equity investment in about five to seven years. This means that the firms receiving the equity finance are expected to produce annual returns for investors of at least 29 percent. Alongside the usual drawbacks of equity capital from the investors’ viewpoint (last in the queue for income and on liquidation, etc.), investors in small unquoted companies also suffer from a lack of liquidity because the shares are not quoted on a public exchange. There are a number of different types of venture capital (the last three are sometimes classified separately – see private equity section later in this chapter):

- *Seedcorn* This is financing to allow the development of a business concept. Development may also involve expenditure on the production of prototypes and additional research.
- *Start-up* A product or idea is further developed, and/or initial marketing is carried out. Companies are very young and have not yet sold their product commercially.
- *Other early-stage* Funds for initial commercial manufacturing and sales. Many companies at this stage will remain unprofitable.
- *Expansion (Development)* Companies at this stage are on to a fast-growth track and need capital to fund increased production capacity, working capital and for the further development of the product or market. Professor Steve Young's company Entropic (see Case study 17.1 at the beginning of the chapter) provides an example of this.
- *Management buyouts (MBO)* Here a team of managers make an offer to their employers to buy a whole business, a subsidiary or a section so that they own and run it for themselves. Large companies are often willing to sell to these teams, particularly if the business is under-performing and does not fit with the strategic core business. Usually the management team have limited funds of their own and so call on venture capitalists to provide the bulk of the finance.
- *Management buy-ins (MBI)* A new team of managers from outside an existing business buy a stake, usually backed by a venture capital fund. A combination of an MBO and MBI is called a BIMBO – buy-in management buyout – where a new group of managers join forces with an existing team to acquire a business.
- *Public-to-private* The management of a company currently quoted on a stock exchange may return it to unquoted status with the assistance of venture capital finance being used to buy the shares.

A combination of an MBO and MBI is called a BIMBO – buy-in management buy-out.

Venture capital firms are less keen on financing seedcorn, start-ups and other early-stage companies than expansions, MBOs and MBIs. This is largely due to the very high risk associated with early-stage ventures and the disproportionate time and costs of financing smaller deals. To make it worthwhile for a VC organization to consider a company the investment must be at least £250,000 – the average investment is about £5m.

Because of the greater risks associated with the youngest companies, the VC funds may require returns of the order of 50–80 percent per annum. For well-established companies with a proven product and battle-hardened and respected management the returns required may drop to the high 20s. These returns may seem exorbitant, especially to the managers set the task of achieving them, but they have to be viewed in the light of the fact that many VC investments will turn out to be failures and so the overall performance of the VC

funds is significantly less than these figures suggest. In fact the British Venture Capital Association reports that returns on funds are not excessively high. Taken as a whole, the return to investors net of costs and fees was 14.6 percent per annum to the end of 2002 for funds raised between 1980 and 1998. This compares well with average annual returns of around 8.8 percent on UK quoted shares in the period 1980 to 2002.

Exhibit 17.7 shows the thrills and spills of VC investing. In 11 months 3i turned £83.5m into £231m by investing in Go: *thrill*. It also reported massive losses on technology investments: *spill*.

### 3i and funds gain £231m on Go stake

Katharine Campbell

3i and its associated funds realised £231m on their stake in Go in less than a year, making it one of the best buy-out investments in the private equity group's history.

easyJet is paying £374m for the discount airline 11 months after British Airways sold it for £110m.

3i's shares rallied 40p to close at 762p yesterday, despite the group unveiling losses of £960m for the year to March 31, alongside the deal. The losses came largely as a result of 3i's misadventures in technology. ...

3i's investment in Go from its own balance sheet, third party funds it manages and syndicate partners totalled £83.5m. The £231m proceeds from the

sale represent a cash-to-cash multiple of about 2.7 times on the investment. ...

Losses on technology investments amounted to £937m, with another £73m in goodwill write-offs for technology investments – acquired during the dotcom bubble.

Buy-out and growth capital investments produced a small positive return of £50m.

3i saw 65 technology companies fail from its portfolio of 809, up from 25 last year. Another 80 non-technology businesses failed, the same number as 2001. ...

New investment levels for the year had halved to just over £1bn from £1.97bn.

#### EXHIBIT 17.7 3i and funds gain £231m

Source: *Financial Times* 17 May 2002

There are a number of different types of VC providers, although the boundaries are increasingly blurred as a number of funds now raise money from a variety of sources. The *independents* can be firms, funds or investment trusts, either quoted or private, which have raised their capital from more than one source. The main sources are pension and insurance funds, but banks, corporate investors and private individuals also put money into these VC funds. *Captives* are funds managed on behalf of a parent institution (banks, pension funds, etc.). *Semi-captives* invest funds on behalf of parent and also manage independently raised funds.

For the larger investments, particularly MBOs and MBIs, the venture capitalist may provide only a fraction of the total funds required. Thus, in a £50m buyout the venture capitalist might supply (individually or in a syndicate with other VC funds), say, £15m in the form of share capital (ordinary and preference shares). Another £20m may come from a group of banks in the form of debt finance. The remainder may be supplied as mezzanine debt – high-return and high-risk debt which usually has some rights to share in the spoils should the company perform exceptionally well (see Chapter 16). In the case of UniPoly (see Exhibit 17.8), of the £620m that was needed to buy this company and provide it with capital for expansion, 28 percent was equity, 64 percent bank debt (28 banks) and 8 percent mezzanine finance (eight lenders).

### Banks replace management at UniPoly

Maggie Urry

The banks that backed the £620m management buy-out of UniPoly in 1997 have brought in a new management to improve the performance of the engineering business . . .

The 28 banks and eight mezzanine lenders in the syndicate have promised to support the business after 'a recent period of uncertainty', said Mr Teacher . . .

Unipoly makes industrial belting, fluid handling equipment and owns Schlegel, the US-based shielding equipment maker. It was sold by BTR, since renamed Invensys, in December 1997.

At the time, UniPoly's diverse product range included water beds for cows and Wellington boots.

The original plan was that the business would be floated, or broken up and sold, within three to five years . . .

BTR received £515m for the company, which also raised a further £105m of capital for expansion.

Legal and General Ventures led the investors who put in £175m of equity and £50m of mezzanine finance, while Fuji Bank led the £395m debt finance.

#### EXHIBIT 17.8 Banks replace management at UniPoly

Source: *Financial Times* 12 June 2001

Venture capitalists generally like to have a clear target set as the eventual 'exit' (or 'take-out') date. This is the point at which the VC can recoup some or all of the investment. The majority of exits are achieved by a sale of the company to another firm, but a popular method is a flotation on a stock market. Alternative exit routes are for the company to repurchase its shares or for the venture capitalist to sell the holding to an institution such as an investment trust.

Venture capital funds are rarely looking for a controlling shareholding in a company and are often content with a 20 or 30 percent share. They may also supply funds through the purchase of convertible preference or preferred shares which give them rights to convert to ordinary shares – which will boost their equity holding and increase the return if the firm performs well. They may also



insist, in an initial investment agreement, on some widespread powers. For instance, the company may need to gain the venture capitalist's approval for the issue of further securities, and they may hold a veto over acquisition of other companies. Even though their equity holding is generally less than 50 percent, the VC funds frequently have special rights to appoint a number of directors. If specific negative events happen, such as a poor performance, they may have the right to appoint most of the board of directors and therefore take effective control. More than once the founding entrepreneur has been aggrieved to find himself/herself removed from power. (Despite the loss of power, they often have a large shareholding in what has grown to be a multi-million pound company.) They are often sufficiently upset to refer to the fund which separated them from their creation as 'vulture capitalist'. But this is to focus on the dark side. When everything goes well, we have, as they say in the business jargon, 'a win-win-win situation': the company receives vital capital to grow fast, the venture capitalist receives a high return and society gains new products and economic progress.

**VC funds frequently have special rights to appoint a number of directors.**

The venture capitalist can help a company with more than money. Venture capitalists usually have a wealth of experience and talented people able to assist the budding entrepreneur. Many of the UK's most noteworthy companies were helped by the VC industry, for example Waterstones bookshops, Derwent Valley Foods (Phileas Fogg Crisps), Oxford Instruments (and in America: Apple computers, Sun Microsystems, Netscape, Lotus and Compaq).

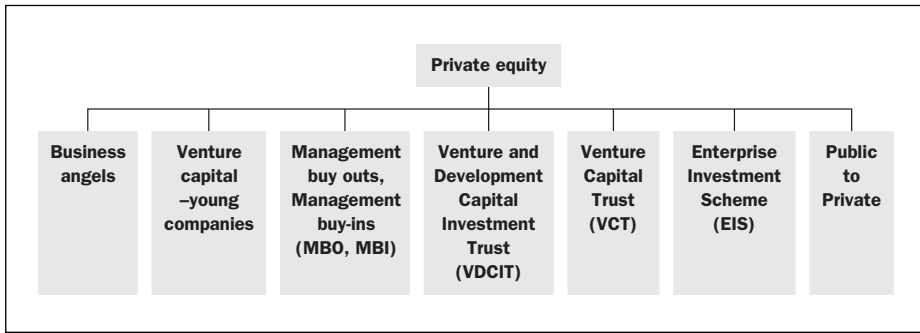
## Private equity

With the growth of share investment outside of stock markets it has become more differentiated. The main categories are shown in Figure 17.6. The title overarching all these activities is private equity. Private equity is defined as medium- to long-term finance provided in return for an equity stake in potentially high growth unquoted companies. In this more differentiated setting the term venture capital is generally confined to describing the building of companies from the ground floor, or at least from a very low base. Management buyouts and buy-ins of established businesses (already off the ground floor) have become specialist tasks, with a number of dedicated funds.

Many of these funds have been formed as private partnerships by wealthy individuals, a high proportion of which are American owned. However, funds such as 3i still conduct traditional VC business and MBOs and MBIs. They are frequently classified as venture and development capital investment trusts (VDCITs), which means they are stock market quoted companies with the objective of investing their shareholders' money in unquoted developing companies. The disadvantage of VDCITs is the absence of tax benefits. This is where the Venture Capital Trusts (VCTs) and the Enterprise Investment Scheme (EIS) come in. They both offer

**The disadvantage of VDCITs is the absence of tax benefits.**



**FIGURE 17.6****Private equity and its component parts**

significant tax breaks to investors in small unquoted companies. Some funds have specialized in providing financial and professional support to quoted companies that wish to leave the stock market – public-to-private deals.

### Venture capital trusts (VCTs)

It is important to distinguish between venture capital trusts, investment vehicles designed to encourage investment in small and fast-growing companies which have important tax breaks, and two other types of venture capital organizations: venture and development capital investment trusts, (VDCITs) which are standard investment trusts with a focus on more risky developing companies, and venture capital funds (described above).

There are tax breaks for investors putting money into VCTs. There is an immediate relief on their current year's income at 40 percent (by putting £10,000 into a VCT an investor will pay £4,000 less tax, so the effective cost is only £6,000). The returns (income and capital gains) on a VCT are free of tax for investments. Investors can place up to £200,000 each per year in VCTs. These benefits are only available to investors buying new VCT shares who hold the investment for three years. The VCT managers can only invest in companies worth less than £15m and the maximum amount a VCT is allowed to put into each unquoted company's shares is limited to £1m per year. ('Unquoted' for VCT is used rather loosely and includes AIM companies.) A maximum of 15 percent of the VCT fund can be invested in any one company. Up to half of the fund's investment in qualifying companies can be in the form of loans. VCTs are quoted on the London Stock Exchange.

### Enterprise Investment Scheme (EIS)

Another government initiative to encourage the flow of risk capital to smaller companies is the Enterprise Investment Scheme. Income tax relief is available for investments of up to £200,000 made directly into qualifying company shares.

Capital gains tax relief is available as well. ‘Direct investment’ means investing when the company issues shares. It does not mean buying in the secondary market from other investors. The tax benefits are lost if the investments are held for less than three years. To raise money from this source the firm must have been carrying out a ‘qualifying activity’ for three years – this generally excludes financial investment and property companies. The company must not be quoted on the Official List and the most it can raise under the EIS in any one year is usually £1m. The company must not have gross assets worth more than £15m. Funds which invest in a range of EIS companies are springing up to help investors spread risk.

**‘Direct investment’ means investing when the company issues shares.**

### Corporate venturing and incubators

Larger companies sometimes foster the development of smaller enterprises. This can take numerous forms, from joint product development work to an injection of equity finance. The small firm can retain its independence and yet contribute to the large firm: perhaps its greater freedom to innovate will generate new products which the larger firm can exploit to the benefit of both. Intel uses corporate venturing to increase demand for its technology by, for example, investing in start-up companies in China. Nokia Venture Partners invests in start-up companies in the wireless internet industry. BT set up Brightstar to harvest value from its 14,000 patents and 2,500 unique inventions in its laboratories.

**The small firm can retain its independence and yet contribute to the large firm.**

Incubators are places where a start-up company not only will gain access to finance, but will be able to receive support in many forms. This may include all humdrum operational managerial tasks being taken care of (e.g. accounting, legal, human resources), business planning, the supply of managers for various stages of the company’s development, property management, etc. As a result the entrepreneurial team can concentrate on innovation and grow the business, even if they have no prior managerial experience.

### Government sources

Some local authorities have set up VC-type funds to attract and encourage industry. Large organizations with similar aims include the Scottish Development Agency and the Welsh Development Agency. Equity, debt and grant finance may be available from these sources.

### Disillusionment and dissatisfaction with quotation

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Appendix 17.1 contains a number of newspaper articles about companies which either are dissatisfied with being quoted on a Stock Exchange or have never been

quoted and feel no need to join. A reading of these will provide a wider understanding of the place of stock markets, their importance to some firms and how many companies are able to expand and produce wealth without them. Some of the main points are summarized in Table 17.4. The arguments are taken directly from the articles and do not necessarily represent reasoned scientific argument.

## Conclusion

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There are a number of alternative ways of raising finance by selling shares. The advantages and problems associated with each method and type mean that careful thought has to be given to establishing the wisest course of action for a firm, given its specific circumstances. Failure here could mean an unnecessary loss of control, an unbalanced capital structure, an excessive cost of raising funds or some other destructive outcome. Joining a stock market is merely one option; it has considerable drawbacks and so is not appropriate for many firms. Many of the UK's most well known entrepreneurs prefer to expand their businesses outside of the stock exchange with a mixture of bank finance, venture capital and plowed-back profits.

## Websites

[www.bvca.co.uk](http://www.bvca.co.uk) British Venture Capital Association  
[www.businesslinks.co.uk](http://www.businesslinks.co.uk) BusinessLinks  
[www.enterprisezone.org.uk](http://www.enterprisezone.org.uk) Enterprise zone  
[www.evca.com](http://www.evca.com) European Private Equity and Venture Capital Associations  
[www.fsa.gov.uk](http://www.fsa.gov.uk) Financial Services Authority  
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[www.fsa.gov.uk/ukla](http://www.fsa.gov.uk/ukla) United Kingdom Listing Authority  
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[www.beerandpartners.com](http://www.beerandpartners.com) Beer & Partners  
[www.entrust.co.uk](http://www.entrust.co.uk) Entrust  
[www.dti.gov.uk](http://www.dti.gov.uk) Department of Trade and Industry

**TABLE 17.4**  
**Arguments for and against joining a stock exchange**

For	Against
<ul style="list-style-type: none"> <li>■ Access to new capital for growth.</li> <li>■ Liquidity for existing shareholders.</li> <li>■ Discipline on management to perform.</li> <li>■ Able to use equity to buy businesses.</li> <li>■ Allows founders to diversify.</li> <li>■ Borrow more easily or cheaply.</li> <li>■ Can attract better management.</li> <li>■ Forces managers to articulate strategy clearly and persuasively.</li> <li>■ Succession planning may be made easier – professional managers rather than family.</li> <li>■ Increased customer recognition.</li> <li>■ Allow local people to buy shares.</li> </ul>	<ul style="list-style-type: none"> <li>■ Dealing with ‘City’ folk is time consuming and/or boring.</li> <li>■ City is short-termist.</li> <li>■ City does not understand entrepreneurs.</li> <li>■ Stifles creativity.</li> <li>■ Focus excessively on return on capital.</li> <li>■ Empire building through acquisitions on a stock exchange – growth for its own sake (or for directors) can be the result of a quote.</li> <li>■ The stock market undervalues entrepreneur’s shares in the entrepreneur’s eyes.</li> <li>■ Loss of control for founding shareholders.</li> <li>■ Strong family-held companies in Germany, Italy and Asia where stock markets are used less.</li> <li>■ Examples of good strong unquoted companies in UK: Bamford, Rothschilds.</li> <li>■ Press scrutiny is irritating.</li> <li>■ Market share building (and short-term low profit margins) are more possible off exchange.</li> <li>■ The temptation of over-rapid expansion is avoided off exchange.</li> <li>■ By remaining unquoted, the owners, if they do not wish to put shareholder wealth at the center of the firm’s purpose, don’t have to (environment or ethical issues may dominate).</li> <li>■ Costs of maintaining a quote, e.g. SE fees, extra disclosure costs, management time.</li> </ul>

## Appendix 17.1 Arguments for and against floating

### JCB's reasons to be private

To float or not to float? Sir Anthony Bamford has no hesitation in answering, writes *Paul Betts*.

'Yes, we have looked at it but for a company like JCB with only a few family shareholders it is not a satisfactory option. We either stay private or sell 100 per cent; and I have no intention of doing that.'

He admits this makes his company somewhat singular: a privately owned, successful British-based manufacturer that is a global brand.

Started in the Midlands in 1945, JCB is now the UK's biggest privately owned manufacturer and the world's fourth largest maker of construction machinery, exporting nearly 75 per cent of its products to 140 countries.

Sir Anthony says the company has remained focused on its business, growing organically in its niche construction, indus-

trial and agricultural equipment markets, relying on its own cash rather than borrowing and adopting a 'simple long-term strategy led by product and innovation'.

Floating the company would have spoilt this. 'If we were a public company we would probably have had to diversify because analysts and stockbrokers would have said we were in a very cyclical industry. They would have ... pushed us into doing things we shouldn't.'

Companies float for several reasons, he says. 'They have lots of shareholders who want to cash in. But we don't. Or they need more capital and, again, we don't. Or they want to have paper to buy other businesses – but we have stuck to organic growth.'

#### EXHIBIT 17.9 JCB's reasons to be private

Source: *Financial Times* 4 February 2003

### Ferrari chief keen for IPO to drive growth

By *Paul Betts* in Maranello

Luca di Montezemolo, Ferrari's chairman, is keen to see the sports car and racing company launch a public offering on the stock market.

He told the *Financial Times* this would help fund Ferrari's expansion into entertainment, including the development of Ferrari theme parks. It also wants to step up its retailing activities and further develop its Maserati car business.

To launch an initial public offer, Mr Montezemolo needs the approval of Ferrari's main shareholder, the Italian Fiat automotive group with 90 per cent of the company. The other 10 per cent is held by Piero Lardi-Ferrari, son of the company's founder.

In a leaked document following a recent board meeting, Fiat said it was contemplating a possible Ferrari IPO within the framework of a programme to cut its €6bn debt. However, a person close to Fiat suggested yesterday that a Ferrari IPO was unlikely before next year. One key issue would be how the proceeds would be split between Fiat and Ferrari.

Ferrari had always relied on its own financial resources and would continue to do so. But at some later stage, an IPO would help raise fresh resources for new developments, he explained.

An IPO would also help develop Maserati. Ferrari relaunched Maserati four years ago and Mr Montezemolo said he now wanted to develop its racing activities.

#### EXHIBIT 17.10 Ferrari chief keen for IPO to drive growth

Source: *Financial Times* 18 March 2002

## Mature, experienced Virgin seeks out bright City lights

Patrick Jenkins

It has taken 14 years, but Sir Richard Branson has finally admitted it. If he is to continue to expand his Virgin empire, he needs the support of the stock market.

Last week, the man famous for unorthodox stunts – he dressed up as a bride to launch his wedding services business and as a can of cola to promote Virgin Drinks – told the Financial Times of his plans to court the City's suits again.

He will float eight companies over the next eight years, generating an estimated £2bn in the process to fund new ventures.

It is an ambitious about-turn. In 1998, after a disappointing 23 months on the stock market, an embarrassed Richard Branson took Virgin Group private again.

He was furious that the stock market could punish such an apparently successful business, and railed against the short-termism of institutional investors. The shares fell 40 per cent over a year and a half before he offered to buy them back at the float price.

When it came to Virgin's shares, it seemed, his thriving consumer brand counted for little.

So why the change of heart? Sir Richard, now 51, says time has healed his wounds. 'We've matured. I have personally and so has the group.'

That may be so, but the truth is there is no other avenue left open to him. Even his biggest and most established ventures – Virgin Atlantic and Virgin Rail – cannot be relied upon to generate profits in the short-term.

Atlantic operates in the notoriously tight-margin airline business and was thrown deep into loss last year – how deeply has not yet emerged – by the evaporation of demand for transatlantic flights in the wake of September 11. Virgin Rail, though likely to turn a profit for last year, faces ever stiffer conditions.

If Sir Richard is to make money from businesses such as these – let alone the myriad smaller companies that have never made a profit – it will have to be through releasing equity.

He has begun the process, in recent years, by selling stakes to private partners. All his biggest businesses are now half-owned by others. Singapore Airlines has bought 49 per cent of Virgin Atlantic. Stagecoach, the transport company, took 49 per cent of Virgin Rail. T-Mobile owns 50 per cent of Virgin Mobile (UK). AMP took half of Virgin Money.

That strategy replaced an earlier model of selling businesses outright – Virgin Records to EMI and Virgin Radio to Scottish Media Group.

Sir Richard is now determined never to cede control like that again. 'Going below a 30 or 35 per cent shareholding is unwise. You lose control of the brand. It hasn't damaged us yet, fortunately. But our future strategy will be to keep reasonable ownership of branded Virgin companies.'

But with the name counting for so much, Sir Richard wants to pre-empt that risk. Floating businesses, while retaining substantial shareholdings, is his new model.

The first company to float, early next year, will be Virgin Blue, the Australian airline that is 50 per cent owned by Patrick Corp.

By 2010, Virgin believes it could be joined by Virgin Mobile (UK); Virgin Entertainment, the retail and cinema business; Virgin Atlantic; Trainline.com, the rail booking operation; Virgin Active healthclubs; Virgin Rail; and Virgin Money, the personal finance operation.

Could the sceptics be right about the black holes in the business? Sir Richard, they say, needs regular billion-pound injections just to stem the haemorrhaging of cash.

The group no longer has a cash cow, with Virgin Atlantic in deficit and Virgin Records sold a decade ago. The majority of businesses lose money. And for a man with a reputation for merciless treatment of competitors, Sir Richard is surprisingly sentimental about his own businesses.

He plans to devote an extra \$500m (£342.4m) to US expansion in addition to the \$162m he recently committed to the mobile phone joint venture with Sprint, the US operator. Much of the money will go towards building a

domestic US airline, providing 'open skies' regulations are amended.

Australia's mobile business is also absorbing investment fast, as is retail expansion in Japan.

The 40 per cent decline in Virgin Group shares in the mid-1980s was an ominous start. Two more disappointments followed. Victory Corp – the clothing and cosmetics business that is 83 per cent owned by Virgin – has slumped 92 per cent since its 1996 float. And Virgin Express, the Brussels-listed airline, is 89 per cent down on its 1997 float price.

### EXHIBIT 17.11 Experienced Virgin seeks out city lights

Source: *Financial Times* 7 May 2002

## A solo artist celebrates his empire

Susanna Voyle

Green's pride at securing his prize – Arcadia and his current BHS business combined will give him some £2.75bn of sales and make him the second largest clothing presence on the high street after Marks and Spencer at £3.6bn.

'I have created Britain's biggest private retail company,' he said. 'Look back in history at all the great entrepreneurs.

People talk about those like Hanson as great empire builders. But that was all done through the stock market money. I have done this as a solo artist.'

'I think private is better than public,' he said. 'Partly because you can spend all your time and attention on the business and not be distracted worrying about reporting and everybody sitting on your head.'

### EXHIBIT 17.12 A solo artist celebrates his empire

Source: *Financial Times* 7/8 September 2002

## Stock market receives a kick in the privates

Norma Cohen

When stock market pundits look back at 2003, the year will show one outstanding characteristic; it was the year in which twice as much equity was withdrawn from the public market in the form of public-to-private deals than was put in through initial public offerings.

Moreover, the attractiveness of private – as opposed to public shareholding – ownership of companies was evident on the Continent as well. According to data from Dealogic, a record of 96 companies were taken private, up from the previous peak in 1999 of 83 transactions.

Indeed, both the absolute number of transactions, and the size of some of the largest deals, has caused investors – those investing in both public and privately-owned equity – to ask the central question: why be a public company anyway?

What business advantages do public companies have over private ones and in any event, are these advantages really so great that they outweigh the costs and penalties privately-held companies manage to avoid?

Investment bankers, whose fortunes are most closely tied to the existence of publicly-owned companies, say the advantages are very clear.

‘The key thing [about a public listing] is that it creates a market in the shares of companies,’ says Paul Baker, co-head of corporate broking at Merrill Lynch. ‘It allows existing shareholders to sell and it creates a relatively easy way of raising new money.’

Moreover, the existence of public stock markets is the bulwark of a capitalist economy. ‘If you believe in capitalism, then you believe in the [stock] market,’ he says.

Also, some bankers say, being public is sometimes the only thing that keeps companies from going to the wall in tough times.

The so-called rescue rights offering – usually loathed by shareholders for the

call it makes on capital – has allowed near-bankrupt companies to get their respective houses in order.

Shareholders say they go along with such transactions in order to avoid losing the money they have already invested, but point out that they frequently demand concessions such as a change in top management.

Marcus Agius, chairman of Lazard, the investment bank, cautions that much of what went on in 2003 reflects an unusual confluence of events, rather than some fundamental reassessment of the merits of public ownership.

‘As share prices collapsed, managements were demoralised,’ he says. ‘Shareholders were saying to boards “Don’t do anything foolish. Fix your company. Get your house in order”’.

In effect, he says, private equity investors who had been sidelined as soaring share prices locked them out of the market saw their opportunity.

Moreover, some bankers say, stunned and disillusioned equity investors, watching markets plumb depths not seen in years, were – despite the modest recovery in stock markets since late spring – prepared to sell out at almost any price, provided it was a premium to wherever share prices were at any particular moment.

However, other investors say that what has gone on over the past year reflects much more than canny buyers seizing the moment. In effect, three previous years of falling stock markets have caused widespread reappraisal of who should, or should not, seek a public listing.

Too many companies, investors say, came to market via aggressive marketing from investment bankers who targeted gullible investors who did not ask enough hard questions.

Privately, investors point to what one terms ‘the ego value’ of running a public company, saying that entrepreneurs who



had built large fortunes see flotation as a means of trumpeting their achievements rather than a means of delivering long-term value to investors. Others, they say, see a float as the best way to get a high price for a company that they have built from scratch but in which they have little interest in its long-term health.

Some also argue that being public requires managements to constantly tell a 'growth story' to investors, a requirement that sometimes drives businesses into activities for which they are not well-suited.

Investors cite the ill-fated overseas expansion drives of some retailers such as Marks and Spencer and WH Smith as activities that might not have been undertaken by privately-held companies.

Also, the need to manage and meet the shareholder expectations in the form

of 'earnings guidance' may have encouraged companies to engage in some of the worst accounting excesses exposed by the meltdown in stock markets.

However, Richard Hughes, fund manager at M&G, an arm of Prudential, argues that the existence of public stock markets promotes popular capitalism, spreads wealth and encourages social cohesion.

'From the UK saver's point of view, a UK Plc dividend stream has been very satisfactory,' he says. When wealth is concentrated in very few hands, it has been by the buy-out of companies such as Arcadia and Selfridges, it concentrates risk and sets limits on democratic wealth creation, he adds.

'It is much better to have lots of little stakes in lots of companies,' he says.

### EXHIBIT 17.13 Stock market receives a kick in the privates

Source: *Financial Times* 31 December 2003

## Fast work if you are out of the spotlight

Peter Smith

John Kelly dismisses the suggestion that private equity groups are akin to dodgy antique dealers when one decides to sell a business to another.

The chief executive of Gala, the bingo and casinos group, has worked with three sets of private equity backers in his seven years at the top and says he can point to the creation of a lot of value over that time.

When Candover and Cinven took control of Gala this year, it was valued at £1.24bn. But in 1997, PPMV and Royal Bank Development Capital paid £236m for what was then Bass's bingo chain. Some of the difference can be explained by Gala's £380m acquisition spree, but not all of it.

As part of the original management buy-in team, Mr Kelly has clear views about running a private equity-backed business.

'Private equity is in the business of exiting and management teams must recognise that, it may be two years or it may be seven. Provided you recognise that from the outset, there is a core of commonality,' he said.

'But if the private equity house has a covert agenda then you have a problem. You will be dancing around the daffodils and there will be a defining event that will cause a problem.'

And Mr Kelly admits to the occasional bust-ups, both strategic and personal.

As part of a reshuffle at CSFB, which acquired a large stake from PPMV, Gala suddenly lost two board directors who were replaced.

'The two original CSFB guys had emotionally done the due diligence on the business and you get to know them better than your wife. There is a bonding process and suddenly these guys go.'

Mr Kelly said both parties had to work to 'rebuild chemistry' to make sure the business wasn't damaged.

He also points to disagreement over a deal which management wanted to undertake but one of the private equity groups did not.

'One [of the backers] felt it was not appropriate and that is life.'

However, the issue led to upheaval, prompting a refinancing of Gala to allow the private equity group to sell.

'There was a parting of the ways. It was difficult and in my view, and if we had 20/20 vision in hindsight, it was avoidable.'

But being close to the owners of the business provides advantages not always available to public companies.

In March 2000, Gala completed a \$400m refinancing and three days later completed the acquisition of Riva, a rival bingo operator, for £90m. And within three months, the group was negotiating with Ladbroke to buy its casino business, which it bought later that year for £235m.

'Doing these three things so close together would not happen in the public company arena. Both the deals have been enormously shareholder value enhancing,' Mr Kelly said.

'We didn't have to do a roadshow to institutions, speak to brokers and analysts but we had to convince one party and that was CSFB. And then the process can be very quick and very clear.'

In a recent US survey, 80 per cent of those polled said they would rather be a chief executive of a private company than a public one.

Tom Wamberg, executive chairman of Clark Consulting, the pay consultancy which carried out the survey, said many executives do not want to operate under the spotlight of the markets.

'Many think that being public is a hassle today, rather than a privilege,' he said.

Mr Kelly may find himself going in the other direction. Although he claims that from 'a personal perspective. I have no aspiration to be a CEO of a large listed company', the next big move for Gala is likely to be a flotation.

'It makes a lot of sense,' Mr Kelly said. 'We went all the way to the wire [earlier this year],' adding that it did not go ahead because of issues concerning valuation.

'But with the IPO market shut, where would a lot of companies have been in the last two years if it wasn't for private equity.'

#### EXHIBIT 17.14 Fast work if you are out of the spotlight

Source: *Financial Times* 10 September 2003

## Climbing aboard the flight from flotation

Phillip Coggan

Farewell to the stock market. Hardly a week goes by without some smaller company announcing that it is in talks about a bid from its founding shareholders or from venture capital groups. By contrast, the new issues calendar looks fairly moribund.

The appeal of a stock market listing seems to be wearing thin. In large part, of course, this is because of three years of falling share prices. There was no shortage of listing applicants four years ago when you could float a brick on the world's stock markets.

Nowadays, however, entrepreneurs fret that the market does not give their shares an appropriate rating. They tire of being cross-questioned by impertinent shareholders about the details of their strategy and the minutiae of their accounts. Life will be better, they feel, outside the public gaze.

They may find that this is an illusion. Venture capital groups can be hard taskmasters. After all, they have large and illiquid stakes and tightly defined return targets. They will be even more attentive to detail than the likes of Fidelity and State Street.

Nevertheless, this flight from quotation does raise some important issues about the future of the stock market. There are more than 2,000 quoted companies in the UK. But the largest 100 companies in the FTSE 100 index comprise more than 80 per cent of the value of the market; while the Hoare Govett Smaller Company index, which covers the smallest 10 per cent of the main market by value, contains 1,284 constituents.

In other words, the vast bulk of investor attention focuses on a very small proportion of the market by number. The minnows of the market are often too tiny to be noticed by the big institutional investors; many would not look at a business valued at less than £100m. By the same token, they would be unlikely to

attract the attention of investment bank analysts; it would not be worth the analysts' time, given the small amount of business such a company would be likely to generate. The same difficulties arise in other markets. Indeed, in the US, the threshold for attracting serious investor interest is probably significantly higher than in the UK.

What then is the point of such small companies being on the market? The theory of stock markets is that they add value by allowing companies to raise new capital, so they can expand. But many quoted companies joined the market, and had their best chance to raise capital, years ago. A lack of serious institutional or analytical interest means that it would be very hard for them to raise new equity capital in current markets.

A few small companies will always be able to exploit their listings. But these are likely to be businesses in fast-growing industries, at least, businesses that are able to *convince* investors they are fast-growing. If they are engineering companies from the UK Midlands or the US Midwest, they have no hope.

In the 1990s, a stock market listing was probably of considerable use to companies in terms of attracting employees, because of the ability to grant stock options to new hires. But since the dotcom bubble burst in 2000, options have become less alluring than cold, hard cash.

A quotation still allows the founders to convert their equity into cash. For many, this must be the biggest remaining attraction of a listing.

But the private route gives the entrepreneur another two bites of the cherry. First, the value of his or her existing holding is increased by the bid premium, financed by the helpful venture capitalists. Then there is the chance to bring the company back to market again, at a much higher evaluation, in a few years' time.

For the last decade, free market enthusiasts have been lecturing the continental Europeans and the Japanese that their system of bank financing for the corporate sector was fatally flawed. The relationship was too cosy, they argued, allowing inefficient management to stay in charge. In contrast, the Anglo-Saxon model allowed shareholders to replace dud executives via the takeover mechanism.

But does a market-based alternative really work, if the participants in the

market are simply not interested in a large number of companies? The stock market's primary function is no longer to raise capital for the corporate sector; indeed in the US and the UK, companies have often been *returning* capital in recent years via share buy-backs. Instead, the stock market exists as a savings vehicle for the private sector and as a means for investment bankers to get rich. The ability to trade shares is valued far more highly than the ability to raise capital.

### EXHIBIT 17.15 Climbing aboard the flight from flotation

Source: *Financial Times* 6/7 September 2003

## Question the sanity of owners who want to float

Jonathan Guthrie

The role of the successful owner-manager appears to offer enviable freedom. If you want to come back late from holiday because the trout are biting, you can.

I was therefore surprised to learn from Neil Austin, head of new issues at KPMG Corporate Finance, that a horde of private businesses are watching market rises for the signal to dust off flotation plans. That is understandable for companies owned by venture capitalists desperate to exit. But you have to question the sanity of any owner manager seeking to float.

Running a small quoted business looks a thoroughly miserable activity. The authorities dump skiploads of red tape on to the hapless incumbent. Meanwhile the City becomes ever more distant, like a snooty waiter who has divined that Sir is not a big tipper.

The brokers, however, will be jolly friendly to private company owners if the market's upward ramble makes initial

public offerings easier to mount. But while they may be able to chivy institutions to take up newly issued shares in smaller cap businesses, I shall be amazed if they can keep the interest up for much longer than it takes to collect their fees.

'There is a real concern about that,' says Mr Austin. 'A lot of companies are switching brokers because they feel unloved by the broker that floated them. But there are too many companies on the market and they need weeding out.'

In spite of a large number of takeovers, new listings mean there are about 2,300 quoted UK businesses today, only 70 fewer than in 1998. That means there are still plenty of bosses of smaller cap companies participating in what one old hand sardonically refers to as 'the circus' – the unrewarding activity of wooing big investors increasingly focused on blue chips.

This chief executive says: 'Every year we spend weeks preparing for a results day in London consisting of

eight meetings with institutions. We always get thoroughly beaten up. Usually there's a common theme. One year they say we're over-exposed overseas. The next year they say our market share is under threat at home.'

Another chief executive I knew was grimly determined to satisfy the ever-changing demands of his City critics. He acquired here, and divested there but none of it made a blind bit of difference to the share price. Eventually he lost his job. It was like watching a tired old performing lion leaping through a series of ever smaller hoops in hope of a juicy steak, which, in the end, was never provided.

Lord Paul, chairman of private steel group Caparo, says: 'The value of a public company is not related to its performance. But that does not mean the market is failing, rather that [its main purpose] is to reflect fashions. In the fashion industry, something made by Gucci is priced four times higher than a similar unbranded item and no one thinks it is odd.'

Bosses who reconcile themselves to apparent valuation anomalies are still likely to balk at the increasing red tape that comes with a listing. A former public company director describes his five-year stint as 'absolutely awful. Every year there was something new to implement and it takes up a lot of time when you do not have a secretariat. If I'd

wanted to spend my days filing in forms I would have joined the civil service.'

Even Lord Hanson, the entrepreneur, who remains a big fan of listings, thinks the UK market is becoming over-regulated. 'The more restricted we are, the less opportunity private enterprise has to flourish,' he says, questioning the value of drafting in legions of new non-executive directors, as the Higgs report advocates.

The supposed downside of staying private is poorer access to capital. However, Lord Paul says that if you have the prospects and chutzpah to engineer a float, you could probably borrow the cash instead.

Lord Hanson adds: 'You really have to ask yourself whether you need public money to grow.' Meanwhile, trade sales can be an easier way of selling out.

One curious drawback of staying private is that without grumpy shareholders and analysts to prick their egos, company bosses can become unpleasantly overbearing. When one of these blimps phones me I hold the receiver at arm's length to avoid concussion.

Lord Paul and Lord Hanson agree that 'discipline' is one of the main benefits bosses get from running a listed business. Lord Paul, who took Caparo private in 1991, says: 'Running a public company taught me a concern for good corporate governance, the importance of keeping monthly accounts and the usefulness of board meetings in decision-making.'

### EXHIBIT 17.16 Question the sanity of owners who want to float

Source: *Financial Times* 13 May 2003

## Small companies urged to think big in hunt for investment

David Blackwell

Small companies – and there are 800 listed in London with a market capitalisation of less than £50m – are being increasingly marginalised by institutional investors.

At the same time, they are failing to excite the interest of private investors. Their options are limited: they can trundle along in obscurity on the Stock Exchange, move back into private ownership or sell themselves to a larger group.

The gulf between them and institutional investors is reflected in startling figures in the latest Department of Trade and Industry report on the sector.

Research showed that more than 60 per cent of small companies felt fund managers did not understand their business. Conversely, more than 70 per cent of fund managers said smaller compa-

nies had a poor grasp of what determined share value ...

[Institutions] are increasing in size as the financial services industry consolidates. Fund managers are also taking a more pan-European view of smaller companies following the introduction of the euro. As a result many institutional investors are beginning to consider any company with a market capitalisation of less than £800m as 'small' ...

In many ways the 800 companies valued below £50m risk being completely ignored, says Paul Myners, a NatWest executive director and part of the City and industry working group behind the DTI report. 'They have got to do something about it; they have got to get out there and beat the drum a bit,' he says.

### EXHIBIT 17.17 Small companies urged to think big in hunt for investment

Source: *Financial Times* 9 February 1999

## Notes

- 1 Except that it shows proportional voting and income rights.
- 2 Responsibility for governing admission to listing, the continuing obligations of issuers, the enforcement of those obligations and suspension and cancellation of listing was transferred from the LSE to the UKLA in 2000.
- 3 Having said this, many business angels (generally those with investments of £10,000–£20,000) have infrequent contact with the company.
- 4 Source: British Venture Capital Association.



# Section IV:

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## MANAGING RISK





## THE FINANCIAL RISKS MANAGERS HAVE TO DEAL WITH

Introduction

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Types of risk

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Risk in the financial structure

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The dangers of gearing

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What do we mean by gearing?

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Agency costs

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Pecking order

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Some further thoughts on debt finance

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Conclusion

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## Introduction

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Running a business naturally entails taking risks – it is what business activity is about. Satisfactory profits rarely emerge from a risk-eliminating strategy; some risk is therefore inevitable. However it is up to managers of firms to select those risks the business might take and those that it should avoid. Take a company like GlaxoSmithKline which accepts high risks in its research and development program. Should it also take a risk with exchange rates when it receives money from sales around the world, or should it try to minimize that particular type of risk?

**taking risks is what business activity is about.**

Risk reduction is often costly. For example, insurance premiums may be payable or transaction costs may be incurred in the derivative markets. Given the additional cost burden managers have to think carefully about the benefits to be derived from reducing or eliminating risk. There are at least three reasons firms sacrifice some potential profits in order to reduce the impact of adverse events.

- *It helps financial planning* Being able to predict future cash flows, at least within certain boundaries, can be advantageous and can allow the firm to plan and invest with confidence. Imagine trying to organize a business if the future cash flows can vary widely depending on what happens to the currency, the interest rate or the price of a vital raw material input.
- *Reduce the fear of financial distress* Some events can disrupt and damage a business to the point of threatening its existence. For example, massive claims have been made against firms involved in the production of asbestos. If it had not been for the passing on of this risk to the insurance companies many of these firms would now be liquidated. A similar logic applies to the insurance of super tankers against an ocean oil spillage. By limiting the potential damage inflicted on firms, not only will the managers and shareholders benefit, but other finance providers, such as banks, will have greater confidence, which will lower the cost of capital.
- *Some risks are not rewarded* It is possible to reduce risk in situations where there are no financial rewards for accepting that extra risk. For example, if British Airways contracted to buy a dozen aircraft from Boeing for delivery over the next ten years and had to pay in dollars as each airplane was completed it would have to accept the risk of a recession in international flights and numerous other risks, but, in the sophisticated foreign exchange markets of today, at least it can eliminate one risk. It does not have to live with any uncertainty about the cost of the airplanes in terms of sterling because it could make an arrangement with a bank at the outset to purchase the required number of dollars for a specified number of pounds at set dates in the future. (These are forward agreements.) British Airways would then know precisely how many pounds will be needed to buy the dollars to pay Boeing in each year of the next decade (*see* Chapter 21 for more currency risk-hedging strategies).

## Types of risk

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A commercial organization has to deal with many different types of risk and we will discuss the four most important: business risk, insurable risk, currency risk and interest-rate risk.

### Business risk

Many of the risks of operating in a competitive business environment have to be accepted by management to a greater or lesser extent. Sales may fall because of, say, recession, or innovative breakthroughs by competitors. Costs may rise because of, say, strong union power or government-imposed tariffs. For some of these risk elements there is little that management can do. However in many areas management can take positive action to reduce risk. For example consider a bakery company heavily dependent on buying in wheat. The managers are likely to be worried that the price of wheat may rise over the forthcoming months, thereby making their operations unprofitable. On the other hand farmers may be worried by the possibility of wheat falling in price. Both would value certainty. One way of achieving this is for the baker and farmer to enter into a wheat futures agreement, in which the baker agrees to take delivery of wheat at a later date at a price that is agreed today. Both sides now know exactly how much the wheat will be sold for and so can plan ahead.

There are other ways of reducing business risk. For example, firms are often faced with a choice between two machines. The first is highly specialized to a particular task, for example, turning out a particular component. The second, slightly more expensive machine can turn out the same component, but can also be used in a more flexible fashion to switch production to other components. The option to use the machine in alternative ways can sometimes have a high value and so it is worthwhile paying the extra initial set-up costs and even higher production costs.

Consider also an electricity generator contemplating the construction of a power plant. The installation of a coal-fired station would be £100m. This would leave the generator dependent on coal price movements for future profitability. An alternative power plant can be switched from coal to gas but costs an additional £30m. The value of the option to switch is then for the management to evaluate and weigh against the extra cost of construction.

Likewise, a car production line may be more expensive if it is to be capable of being used for a number of different models. But the option to use the facility for more than one type of car reduces the firm's risk by making it less dependent on one model. These are examples of real options, which are considered further in Chapter 19.

## Insurable risk

Many risks encountered by business can be transferred, through the payment of a premium, to insurance companies. These include factory fires, pollution damage and accidental damage to vehicles and machinery. Insurance companies are often better able to bear risk than ordinary commercial firms. The reasons for this are the following:

- experience in estimating probabilities of events and therefore ‘pricing’ risk more efficiently;
- knowledge of methods of reducing risk. They can pass on this knowledge to the commercial firms which may obtain lower premiums if they take precautionary measures;
- ability to *pool* risks, in other words, to diversify risk. The chance of an accident occurring in one firm is highly uncertain, but the probability of a particular proportion of a portfolio of insurance policies making a claim is fairly predictable.

Insurance can be an expensive option because of the tendency for insurance companies to charge for much more than the probability of having to pay out. For example, if there was a one in a hundred chance of your £10,000 car being stolen in a year and never recovered then for every 100 cars insured the insurance company will expect one £10,000 claim per year. The insurance premium to each owner to cover this specific type of risk would, justifiably, be slightly over £100 (£10,000/100), to allow for a modest profit. However, in reality, the premium may be much more than this. The insurance company is likely to have to bear significant administrative costs in setting up the policy in the first place and then dealing with subsequent claims. Anyone who has had to communicate with an insurance company quickly becomes aware of the mountain of paperwork they generate annually. Insurance companies also have to charge premiums sufficiently high to cover the problems of ‘adverse selection’. Put it this way: you may be a sensible car owner, being cautious about where you park your car, never

**The grouping together of good and bad risks tends to increase the cost of insurance.**

leave the doors unlocked and live in a good part of town, but many of the other purchasers of theft insurance may be less fastidious and fortunate. The grouping together of good and bad risks tends to increase the cost of insurance to relatively good policy-

holders. This is made worse for the good policyholders by the increased tendency of those in high-risk situations to buy insurance.

The third boost to insurance premiums comes from ‘moral hazard’ (the encouragement of bad behavior) which causes holders of insurance to be less careful than they might otherwise be – the ‘It’s all right, don’t worry, it’s insured’ syndrome. An extreme example of moral hazard has been created with the ‘new-for-old’ policies for electrical items in which a brand new TV, for example, is provided should the old one suffer accidental damage – some have been tempted to ‘accidentally’ drop the TV!

These three additional costs may push insurance premiums beyond acceptable levels for a firm. In some cases large corporations have taken the bold decision to bear many insurable risks. They may still pay insurance premiums to safeguard against major events which threaten the continuance of the firm but accept routine risks themselves such as machine breakdown, accidents at work, etc. There seems little point in paying premiums just to receive a regular, but lower, inflow in return.

### **Currency risk**

Another major area of responsibility for the corporate treasurer is in the management of risk that arises because exchange rates move. Take the case of Acarus plc which has sold electrical goods to an Australian importer on six months' credit. The importer is sent an invoice requiring payment of A\$20m. The current exchange rate is two Australian dollars to one pound so if currency rates do not change in the subsequent six months Acarus will receive £10m. If the exchange moves to A\$1.80 : £1 then Acarus will receive £11.11m, and will be very pleased with the extra £1.11m of income. However matters might turn out worse than expected. Say the rate of exchange moved to A\$2.20 : £1. Then Acarus would receive only £9.09m. If the management team are risk averse they may say to themselves, 'While we like the possibility of making additional profit on the deal this is more than outweighed by the downside risk of making less than £10m'. There are various ways of ensuring that Acarus receives at least £10m and Chapter 21 is devoted to the subject of exchange-rate risk management. Here we will have just a taster. One of the possibilities is for Acarus to buy an option giving the firm the right but not the obligation to exchange A\$20m for sterling at a rate of A\$2 : £1 in six months. If the dollar appreciates against the pound to A\$1.80 then Acarus would choose not to exercise the option – to let it lapse – and then exchange the A\$20m for £11.11m in the spot market in six months' time. Alternatively, if the dollar falls against sterling Acarus would insist on exercising the option to receive £10m rather than exchanging at the spot rate of A\$2.20 : £1 and therefore achieving a mere £9.09m. By purchasing the option Acarus ensures that the lowest amount it will receive is £10m and the upside potential is unrestrained. However it would need to pay a hefty premium to the option seller for passing on this risk – perhaps 2 to 4 percent of the amount covered. The difficult part is weighing the cost of risk-reducing action against the benefit.

### **Interest-rate risk**

Interest rates cannot be predicted with any degree of accuracy. If a company has large amounts of floating-rate debt it could be vulnerable to interest-rate rises. Alternatively, a company with large fixed-rate debt could have to face living with regret, and higher debt costs than necessary, if interest rates fall.

There is a wide variety of arrangements and financial products which enable a treasurer to reduce the firm's exposure to the vicissitudes of interest rates. Chapter 20 explores a number of them. Here we examine one of the weapons in the treasurer's armoury – the cap.

Ace plc wishes to borrow £20m to finance a major expansion. It does so at a floating rate of LIBOR plus 150 basis points. LIBOR is currently 8 percent and therefore Ace pays a rate of 9.5 percent. This loan is a large sum relative to Ace's capital base and profits, and the management are concerned that if LIBOR rises above 10 percent the firm will get into serious financial difficulty. To avoid this Ace purchases a cap agreement by which a bank promises to pay any interest charge above a LIBOR of 10 percent. Thus, if two years later LIBOR rises to 11 percent, without the cap Ace would pay 12.5 percent. However, Ace can call upon the bank that made the cap agreement to pay the extra 1 percent. Ace's interest charge cannot go beyond a total of  $(10 \text{ percent} + 1.5 \text{ percent}) = 11.5 \text{ percent}$ . What is more, Ace can benefit if interest rates fall because rates are linked to a variable LIBOR at any rate below the cap. The premium charged by the bank for this form of interest-rate insurance can be quite substantial but there are ways of offsetting this cost, for example by simultaneously selling a floor, but consideration of these will have to wait until Chapter 20. Suffice to say, the judicious management of interest-rate risk can be an important managerial task.

## Risk in the financial structure

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Obtaining the most appropriate mixture of finance is likely to be of great importance to most firms. The key issues are: whether your firm should be borrowing more through short-term lending agreements, by overdraft, say, or whether more long-term types of finance are more appropriate, (should you, for instance increase the proportion of long-term finance (debt plus equity) until it matches the value of all the firm's assets, or only to the point where long-term finance covers the long-term asset values and short-term finance is used for the purchase of short-term assets?); whether you should borrow only in your home currency or in a variety of currencies, perhaps to match the currencies in which the firm's assets and sources of revenue originate; whether fixed-rate interest rates are more appropriate than interest rates that go up and down with a benchmark rate, such as LIBOR. Finally, we need to work out what is an appropriate level of borrowing relative to the equity capital held in the company given the trade off between the lower rate of return demanded on debt capital and the dangers of taking on more borrowing.

### Is it better to borrow long or short?

Once a company has decided to raise funds by borrowing, it then has to decide whether to raise the money through:

- short-term debt – a loan which has to be repaid within, say, one year;
- medium-term debt; or
- long-term debt – where the loan is paid over a 10-, 25- or even 100-year period.

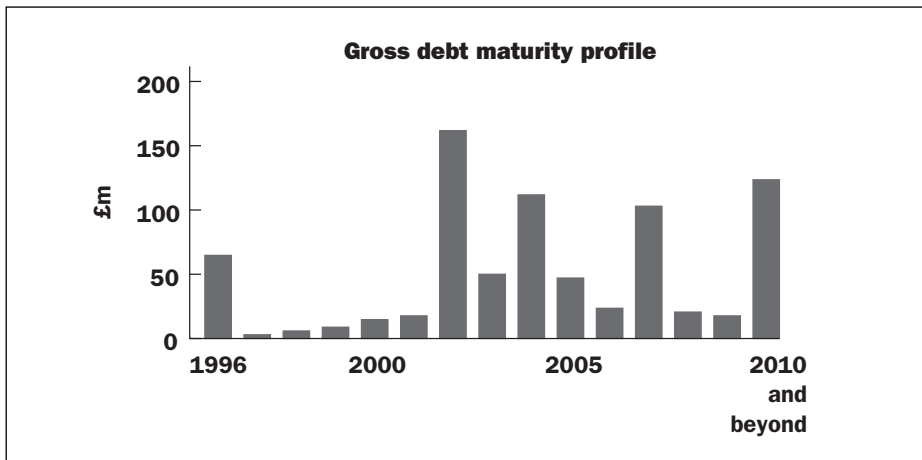
A number of factors need to be taken into consideration when making a decision of this nature.

- *Maturity structure* A company will usually try to avoid having all of its debts maturing at or near the same date. It could be disastrous if the firm was required to repay loan capital on a number of different instruments all within, say, a six-month period. Even if the firm is profitable the sudden cash outflow could lead to insolvency. A number of major UK retailers came perilously close to this in the early 1990s. In the late 1980s they had experienced a boom in sales and everything the management touched seemed to turn to gold. Buoyed up by overoptimism, they opened up dozens of new branches, funded to a large extent by medium-term finance. By the time these bank loans, bonds, etc. came to maturity in the early 1990s these shop chains were already suffering from a biting recession and an excessive cost base. Negotiations with bankers and others were necessary as loan covenants were broken and bankruptcy loomed. Most of the larger groups survived but they have learnt a hard lesson about the importance of spreading the dates for principal repayment.

Thames Water plc regards this issue as sufficiently important for it to include a graph in its annual accounts showing the years in which its debt matures – see Figure 18.1.

**FIGURE 18.1**

**An example of a company conscious of the necessity for a range of maturity dates for debt – Thames Water plc**



Source: Thames Water, Annual Report and Accounts 1995



- *Costs of issue/arrangement* It is usually cheaper to arrange an overdraft and other one-off short-term finance than long-term debt facilities, but this advantage is sometimes outweighed by the fact that if funds are needed over a number of years short-term debt has to be renewed more often than long-term debt. So over, say, a 20-year period, the issuing and arrangement costs of short-term debt may be much greater than a 20-year bond.
- *Flexibility* Short-term debt is more flexible than long-term debt. If a business has fluctuations in its needs for borrowed funds, for example it is a seasonal business, then for some months it does not need any borrowing funds, whereas at other times it needs large loans. A long-term loan may be inefficient because the firm will be paying interest even if it has surplus cash. True, the surplus cash could be invested but the proceeds are unlikely to be as great as the cost of the loan interest. It is cheaper to take out short-term loans or overdrafts when the need arises which can be paid back when the firm has high cash inflows.
- *The uncertainty of getting future finance* If a firm is investing in a long-term project which requires borrowing for many years it would be risky to finance this project using one-year loans. At the end of each year the firm has to renegotiate the loan or issue a new bond. There may come a time when lenders will not supply the new money. There may, for example, be a change in the bank's policy or a reassessment of the borrower's creditworthiness, a crisis of confidence in the financial markets or an imposition of government restrictions on lending. Whatever the reason, the project is halted and the firm loses money.

To some extent, the type of project or asset that is acquired determines the type of borrowing. If the project or asset is liquid and short term then short-term finance may be favored. If it is long term then longer-term borrowing gives more certainty about the availability of finance, and (possibly) the interest rate.

- *The term structure of interest rates* The term structure of interest rates describes how the same borrower (same risk class of borrower, at least) has the pay different interest rates depending on whether the loan is for 1, 2, 3, 4, 10 or 30 years. On a graph with number of years to maturity of the loan along the x-axis and interest rate on the y-axis we observe a rising or declining interest rate as the length of time to maturity of the loan increases. This is called a yield curve. It is usual to find interest rates on short-term borrowing are lower than on long-term debt.<sup>1</sup> This may encourage managers to borrow on a short-term basis. In many circumstances this makes sense. Take the case of Myosotis plc, which requires £10m of borrowed funds for a ten-year project. The corporate treasurer expects long-term interest rates to fall over the next year. It is therefore thought unwise to borrow for the full ten years at the outset. Instead the firm borrows one-year money at a low interest rate with the expectation of replacing the loan at the end of the year with a nine-year fixed-rate loan at the then reduced rate.

However there are circumstances where managers find short-term rates deceptively attractive. For example, they might follow a policy of borrowing at short-term rates while the yield curve is still upward sloping, only switching to long-term borrowing when short-term rates rise above long-term rates. Take the case of Rosa plc, which wishes to borrow money for five years and faces the term structure of interest rates shown in the lower line of Figure 18.2. If it issued one-year bonds the rate of return paid would be 7 percent. The returns required on four-year and five-year bonds are 8 percent and 8.3 percent respectively. The company opts for a one-year bond with the expectation of issuing a four-year bond one year later. However by the time the financing has to be replaced, 365 days after the initial borrowing, the entire yield curve has shifted upwards due to general macroeconomic changes. Now Rosa has to pay an interest rate of 10 percent for the remaining four years. This is clearly more expensive than arranging a five-year bond at the outset.

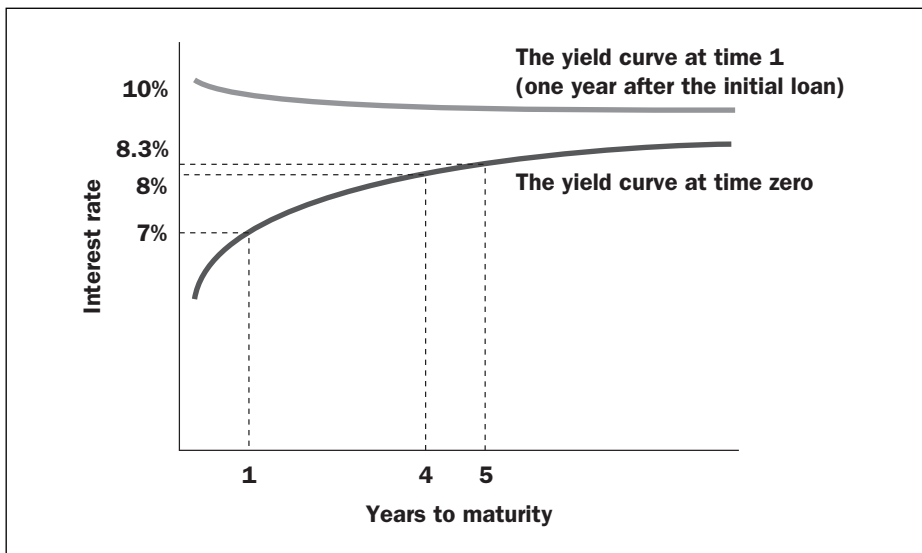
The case of Rosa shows that it can be cheaper to borrow long at low points in the interest rate cycle despite the 'headline' interest charge on long-term debt being greater than on short-term loans.

### To 'match' or not to 'match'?

Firms usually come to the conclusion that there is a need for an appropriate mixture of debt finance with regard to length of time to maturity: some short-term borrowing is desirable alongside some long-term borrowing. The major factors which need to be taken into account in achieving the right balance are: (a) cost

**FIGURE 18.2**

**A shifting yield curve affects the relative cost of long- and short-term borrowing – the example of Rosa plc**



(interest rate, arrangement fee, etc.) and (b) the risk (of not being able to renew borrowings, of the yield curve shifting, of not being able to meet a sudden out-flow if the maturity is bunched, etc.). Some firms follow the ‘matching’ principle, in which the maturity structure of the finance matches the maturity of the project or asset. Here fixed assets and those current assets which are needed on a permanent basis (for example cash, minimum inventory or debtor levels) are financed through long-term sources, while current assets whose financing needs vary throughout the year are financed by short-term borrowings. Examples of the latter type of asset might be stocks of fireworks at certain times of the year, or investment in inventories of Easter eggs in the spring.

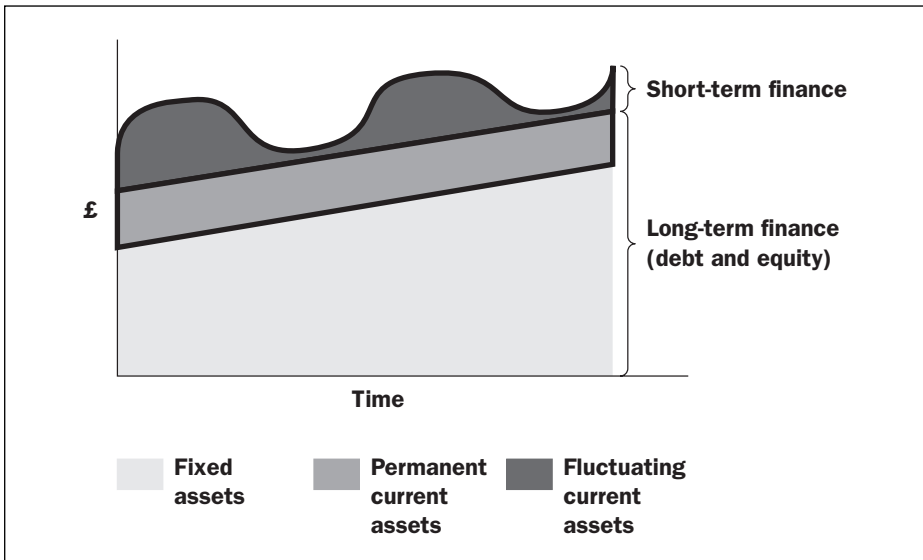
Three types of asset need to be financed:

- fixed assets
- permanent current assets
- fluctuating current assets.

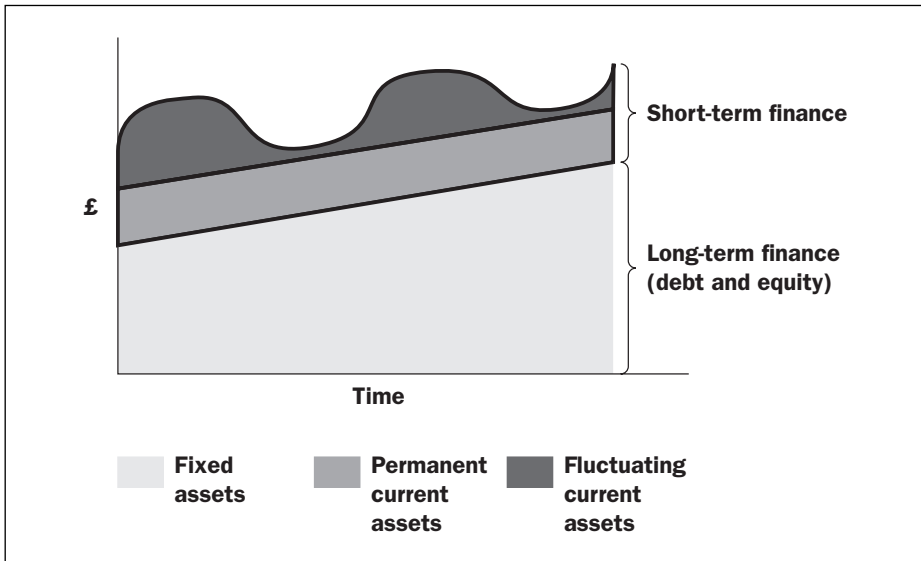
A firm taking the maturity matching approach is considered to be adopting a moderate stance. This is shown in Figure 18.3, where a rising level of total assets is financed principally through increases in long-term finance applied to fixed assets and permanent current assets. The fluctuating current assets, such as those related to seasonal variations, are financed with short-term funds.

A more aggressive approach is represented in Figure 18.4. This entails more risk because of the frequent need to refinance to support permanent current assets as well as fluctuating current assets. If the firm relied on an overdraft for this it will be vulnerable to a rapid withdrawal of that facility. If stocks and cash

**FIGURE 18.3**  
Moderate financing policy stance – the matching principle



**FIGURE 18.4**  
**An aggressive financing policy**



are reduced to pay back the overdraft the firm may experience severe disruption, loss of sales and output, and additional costs because of a failure to maintain the minimum required working capital to sustain optimum profitability.

The low-risk policy is to make sure that long-term financing covers the total investment in assets. If there are times of the year when surplus cash is available this will be invested in short-term instruments. This type of policy is shown in Figure 18.5.

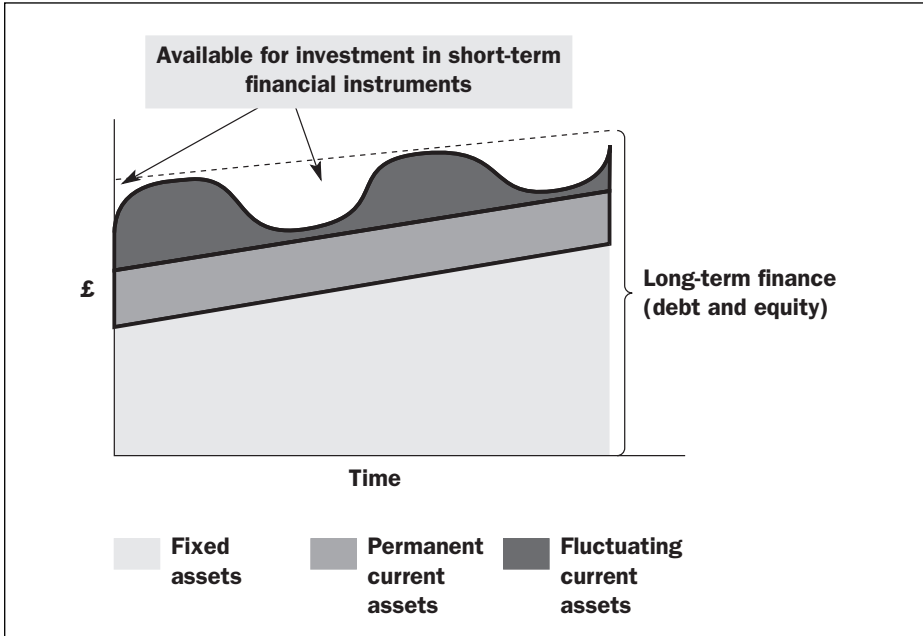
Many managers would feel much happier under the conservative approach because of the lower risk of being unable to pay bills as they arise. However such a policy may not be in the best interests of the owners of the firm. The surplus cash invested in short-term securities is unlikely to earn a satisfactory return relative to the cost of the long-term funds. In all likelihood shareholders would be better off if the firm reduced its long-term financing, by returning cash to shareholders or paying off some long-term loans.

There is no sound theoretical formula to help decide the balance between long- and short-term finance, while many managers follow a policy of matching the maturity of their assets and liabilities, thereby accepting a modest level of risk while avoiding excessive amounts of surplus investible funds, this is far from universally accepted: for example, Microsoft has over \$50bn of cash and short-term investments.

### The currency of borrowing

Deciding on the maturity structure of the firm's debt is one aspect of the financing decision. Another is selecting the currency in which to borrow. For

**FIGURE 18.5**  
**A conservative financing policy**



transnational firms it is common to find borrowing in the currency of the country where the funds are to be invested. This can reduce exposure to foreign exchange rate changes. For example, suppose that Union Jack plc borrows £100m to invest in the USA. It exchanges the £100m into \$150m at the exchange rate of \$1.5 to the pound. The net cash flows in subsequent years are expected to be \$30m per annum. If the exchange rate remained constant Union Jack would therefore receive £20m per year to pay for the financing costs and produce a surplus. However if the rate of exchange moved to \$2 for every pound the annual cash inflow in sterling terms would be merely £15m.<sup>2</sup> The project is producing £5m less than originally anticipated despite generating the same quantity of dollars, and this is insufficient as a rate of return for Union Jack. The risk attached to this project can be reduced by ensuring that the liabilities are in the same currency as the income flow. So if Union Jack borrows \$150m to invest in the project, even though the exchange rate may move to \$2 : £1 the project remains viable. Currency risk is considered in more detail in Chapter 21.

**The interest rate choice**

Another consideration for the debt portfolio is the balance to be struck between fixed and floating interest-rate borrowings. In many circumstances it is thought advisable to have a mixture of the two types of borrowing. If all the borrowings are floating rate then the firm is vulnerable to rising interest rates. This often

happens at the most unfortunate times: for example, at the start of recessions interest rates are usually high at the same time as sales are in decline.

Industries with high fixed-cost elements, which need a large volume of sales to maintain profitability, may be particularly averse to floating-rate borrowing as this may add to their cost base and create an additional source of risk. Even if they have to pay more for fixed-rate borrowing initially, the directors may sleep better knowing that one element of risk has been eliminated.

If all borrowing is fixed rate the firm is unable to take advantage of a possible decline in interest rates.

## The dangers of gearing

Someone has to decide what is an appropriate level of borrowing for a firm given its equity capital base. This is a difficult decision given the range of positive and negative consequences of increased borrowing. As debt levels rise the firm's earnings attributable to shareholders become increasingly volatile due to the requirement to pay large amounts of interest prior to dividends. Eventually the

### The balance between debt and ordinary share capital

In 2001 BT management was in serious trouble. The company had accumulated debt of over £30bn following a worldwide acquisition spree and infrastructure investment. The net assets of the company were roughly half the debt level, at £14bn. The City institutions were desperately concerned by the high level of debt. Sir Peter Bonfield, the chief executive, recognised that he had allowed the debt to rise too high. 'We identified the need to introduce new equity capital into the business to support the reduction in the unsustainable level of group debt' (BT Annual Report 2001). The company raised £5.9bn through a rights issue, sold off property, slashed investment and sold stakes in telecom businesses around the world. It also stopped paying a dividend.

Bristol Water announced plans to return £50m of cash to shareholders as part of a balance sheet restructuring in 2003. The company was valued at only

£90m at the time. 'Bristol Water was overcapitalized and it was time to do something for the shareholders' said John Murray, representative of the largest shareholder.<sup>3</sup>

Next implemented a share buy back plan for up to 19 per cent of its shares in 2002, following the return of £435m to shareholders through buy-backs in the 2000-2002 period. David Jones, chairman, said the share buy-backs represented the best way to enhance earnings per share.<sup>4</sup> In the same year Next's high street rival Marks and Spencer announced plans to return £2 billion to shareholders, in 'a move to re-engineer the balance sheet after years of underperformance.'<sup>5</sup> The retailer said: 'We think we are getting a more efficient balance sheet by increasing debt and reducing equity'. Capita, the outsourcing group announced similar buy-back plans in 2002 'to reduce our cost of capital'.<sup>6</sup>

**EXHIBIT 18.1** The balance between debt and ordinary share capital

burden of a large annual interest bill can lead the firm to become financially distressed and, in extreme circumstances, liquidated. If the gearing level is too low, shareholder value opportunities are forgone by not substituting ‘cheap’ debt for equity. Exhibit 18.1 provides some of the evidence that this is a key issue at the heart of senior managerial decision-making.

**Debt finance is cheaper and riskier (for the company)**

Financing a business through borrowing is cheaper than using equity. This is, first, because lenders require a lower rate of return than ordinary shareholders. Debt financial securities present a lower risk than shares for the finance providers because they have prior claims on annual income and in liquidation. In addition security is often provided and covenants imposed.

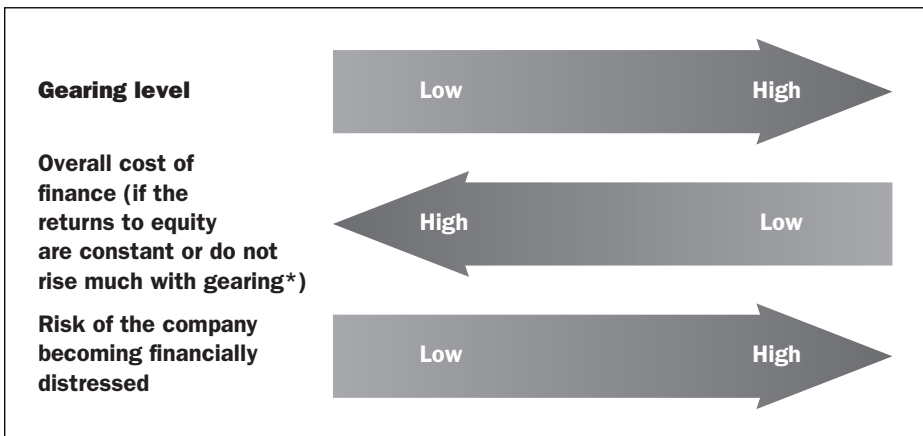
A profitable business effectively pays less for debt capital than equity for another reason: the debt interest can be offset against pre-tax profits before the calculation of the corporation tax bill, thus reducing the tax paid.

Third, issuing and transaction costs associated with raising and servicing debt are generally less than for ordinary shares.

There are some valuable benefits from financing a firm with debt. So why do firms tend to avoid very high gearing levels? One reason is financial distress risk. This could be induced by the requirement to pay interest regardless of the cash flow of the business. If the firm hits a rough patch in its business activities it may have trouble paying its bondholders, bankers and other creditors their entitlement. Figure 18.6 shows that, as gearing increases, the risk of financial failure grows.

Note the crucial assumption in Figure 18.6 – if the returns to equity are constant, or do not rise much, the overall cost of finance declines. This is obviously

**FIGURE 18.6**  
**At low gearing levels the risk of financial distress is low, but the cost of capital is high; this reverses at high gearing levels**



Note: \*This assumption is considered in the text.

unrealistic because as the risk of financial distress rises ordinary shareholders are likely to demand higher returns. This is an important issue and we will return to it after a discussion of some basic concepts about gearing.

**If the returns to equity are constant, or do not rise much, the overall cost of finance declines.**

## What do we mean by gearing?

We need to avoid some confusion possible when using the word 'gearing'. First, we should make a distinction between operating gearing and financial gearing.

*Operating gearing* refers to the extent to which the firm's total costs are fixed. The profits of firms with high operating gearing, such as car or steel manufacturers, are very sensitive to changes in the sales level. They have high break-even points (the turnover level at which profits are achieved) but when this level is breached a large proportion of any additional sales revenue turns into profit because of the relatively low variable costs.

*Financial gearing* concerns the proportion of debt in the capital structure. Net income to shareholders in firms with high financial gearing is more sensitive to changes in operating profits.

The terms gearing and leverage are used interchangeably by most practitioners, although leverage is used more in the USA.

There are many different ways of calculating financial gearing (to be called simply 'gearing' throughout this chapter). Financial analysts, the press and corporate managers usually measure gearing by reference to balance sheet (book) figures, but it is important to recognize that much of finance theory concentrates on the market values of debt and equity. Both book and market approaches are useful, depending on the purpose of the analysis.

There are two ways of putting in perspective the levels of debt that a firm carries. *Capital gearing* focusses on the extent to which a firm's total capital is in the form of debt. *Income gearing* is concerned with the proportion of the annual income stream (that is, the pre-interest profits) which is devoted to the prior claims of debt holders, in other words, what proportion of profits is taken by interest charges.

**FIGURE 18.7**

**A firm's financial gearing can be measured in two ways**





## Capital gearing

There are alternative measures of the extent to which the capital structure consists of debt. One popular approach is the ratio of long-term debt to shareholders' funds (the debt to equity ratio). The long-term debt is usually taken as the balance sheet items 'amounts falling due after more than one year' and shareholders' funds is the net asset (or net worth) figure in the balance sheet.

$$\text{Capital gearing (1)} = \frac{\text{Long-term debt}}{\text{Shareholders' fund}}$$

This ratio is of interest because it may give some indication of the firm's ability to sell assets to repay debts. For example, if the ratio stood at 0.3, or 30 percent, lenders and shareholders might feel relatively comfortable as there would be, apparently, over three times as many net (that is after paying off liabilities) assets as long-term debt. So, if the worst came to the worst, the company could sell assets to satisfy its long-term lenders.

There is a major problem with relying on this measure of gearing. The book value of assets can be quite different from the saleable value. This may be because the assets have been recorded at historical purchase value (perhaps less depreciation) and have not been revalued over time. It may also be due to the fact that companies forced to sell assets to satisfy creditors often have to do so at greatly reduced prices if they are in a hurry.<sup>7</sup>

Second, this measure of gearing can have a range of values from zero to infinity and this makes inter-firm comparisons difficult. The measure shown below puts gearing within a range of zero to 100 percent as debt is expressed as a fraction of all long-term capital.<sup>8</sup>

$$\text{Capital gearing (2)} = \frac{\text{Long-term debt}}{\text{Long-term debt} + \text{Shareholders' funds}}$$

These ratios could be further modified by the inclusion of 'provisions' and deferred taxation. Provisions are sums set aside in the accounts for anticipated loss or expenditure, for example a bad debt or costs of merger integration. Deferred tax likewise may be included as an expected future liability.

The third capital gearing measure, in addition to allowing for long-term debt, includes short-term borrowing.

$$\text{Capital gearing (3)} = \frac{\text{All borrowing}}{\text{All borrowing} + \text{Shareholders' funds}}$$

Many firms rely on overdraft facilities and other short-term borrowing, for example commercial paper. Technically these are classified as short term. In reality many firms use the overdraft and other short-term borrowing as a long-term source of funds. Furthermore, if we are concerned about the potential for financial distress, then we must recognize that an inability to repay an overdraft can be just as serious as an inability to service a long-term bond.

To add sophistication to capital gearing analysis it is often necessary to take into account any cash (or marketable securities) holdings in the firm. These can be used to offset the threat that debt poses.

A measure of gearing which is gaining prominence is the ratio of debt to the total market value of the firm's equity (also called the debt to equity ratio (market value)).

**An inability to repay an overdraft can be just as serious as an inability to service a long-term bond.**

$$\text{Capital gearing (4)} = \frac{\text{Long-term debt}}{\text{Total market capitalization}}$$

This has the advantage of being closer to the market-value-based gearing measures (assuming book long-term debt is similar to the market value of the debt). It gives some indication of the relative share of the company's total value belonging to debt holders and shareholders.

It is plain that there is a rich variety of capital gearing measures and it is important to know which measure people are using – it can be very easy to find yourself talking at cross-purposes.<sup>9</sup>

## Income gearing

The capital gearing measures rely on the appropriate valuation of net assets either in the balance sheet or in a revaluation exercise. This is a notoriously difficult task to complete with any great certainty. Try valuing a machine on a factory floor, or a crate of raw material. Also the capital gearing measures focus on a worst case scenario: 'What could we sell the business assets for if we had to, in order to pay creditors?'

It may be erroneous to focus exclusively on assets when trying to judge a company's ability to repay debts. Take the example of a successful advertising agency. It may not have any saleable assets at all, apart from a few desks and chairs, and yet it may be able to borrow hundreds of millions of pounds because it has the ability to generate cash to make interest payments. Thus, quite often, a more appropriate measure of gearing is one concerned with the level of a firm's income relative to its interest commitments:

$$\text{Interest cover} = \frac{\text{Profit before interest and taxes}}{\text{Interest charges}}$$

The lower the interest cover ratio the greater the chance of interest payment default and liquidation. The inverse of interest cover measures the proportion of profits paid out in interest – this is called income gearing.

Table 18.1 presents an extract from a report designed to assist managers. It gives some idea of the typical gearing ratios for medium-sized firms (turnover £1m–£50m) in Britain's East and West Midlands regions. This draws on data from over 1,200 firms and provides average figures for a ten-year period.

**TABLE 18.1**  
**Solvency/liquidity averages**

	Quick ratio		Total debt/ Net worth (%)		Long-term debt/Net worth (%)		Interest/Pre- interest profit (%)	
	East Mids	West Mids	East Mids	West Mids	East Mids	West Mids	East Mids	West Mids
Chemicals	2.24	1.00	140	67	137	24	28	23
Metal goods	1.08	1.00	90	175	40	70	19	27
Mechanical engineering	1.08	0.94	76	145	28	55	18	29
Electrical and electronic engineering	0.87	0.90	118	186	35	83	27	20
Rubber and plastics	0.86	0.85	131	108	45	37	30	36
Textiles	0.85	0.80	131	86	51	23	38	28
Footwear and clothing	1.00	0.66	89	80	21	15	24	42
Food, drink and tobacco	0.95	0.67	76	164	32	34	33	29
Paper, print and publishing	0.96	1.05	109	84	63	30	29	24
Construction	0.78	0.88	75	81	23	18	23	20
Wholesale distribution	0.89	0.79	145	206	27	32	33	38
Retail distribution	0.56	0.54	158	132	40	26	51	40
Business services	1.06	1.09	125	166	40	98	24	19

### Solvency and liquidity ratios

*Quick ratio (acid test)* is the ratio of current assets less stock to total current liabilities. It measures the extent to which short-term assets are adequate to settle short-term liabilities. The stock figure is excluded on the grounds that stock may take several months to turn into cash.

*Total debt/Net worth* as a ratio expresses total debt (formal long- and short-term loans) as a percentage of net worth (a measure of shareholders' funds). It shows the extent to which lenders have financed the firm's assets. It is often called the borrowing ratio.

*Long-term debt/Net worth* expresses long-term debt as a percentage of net worth (shareholders' funds). It is a narrower measure of gearing than the total debt/net worth ratio. By comparing the two ratios, it is possible to establish the relative proportions of long-term and short-term debt. Relying too heavily on short-term debt can lead to difficulties. For example, bank overdrafts can be recalled at very short notice.

*Interest/Pre-interest profit* expresses gross interest payable as a percentage of pre-interest and pre-tax profit. It gives an indication of ability to cover interest payments. The greater the proportion of profits that have to be paid out in interest payments, the riskier the firm's position. A ratio of 100 percent means that all pre-interest profit is used to pay interest to lenders, leaving nothing to add to shareholder wealth. The inverse of this ratio is known as 'Interest cover'.

Source: Arnold, G.C. and Davis, P. (1995) *Profitability Trends in West Midlands Industries*, Lloyds Bowmaker Corporate Finance. Reprinted with permission of Lloyds UDT Limited.

The Lex column of the *Financial Times* commented on the most appropriate measures of gearing for modern industry (see Exhibit 18.2).

## Goodbye gearing

Investors have long used balance-sheet gearing as the main yardstick of a company's indebtedness. In the past, this was appropriate as the balance sheet offered a reasonable guide to a company's value. But balance sheets are now scarcely relevant as a measure of corporate worth. As the world economy shifts from manufacturing to services, value is increasingly the product of human brains. Companies like Microsoft, Disney and Marks & Spencer owe their success to intellectual property, media creations and brands. Unlike physical property or machines, such products of the mind do not typically appear on balance sheets. Even in manufacturing, inflation and arbitrary depreciation policies make balance sheets a misleading guide to value.

If balance-sheet gearing is no longer useful, what yardsticks should be

employed instead? One option is to look at interest cover – either operating profit or operating cash flow divided by interest payments. Such ratios measure how easy it is for companies to service their debts. Different levels of interest cover are appropriate for different types of company; clearly, cyclicals need higher ratios than utilities.

Another option is to divide a company's debt by its market capitalization. Market capitalization overcomes the inadequacies of balance-sheet measures of equity. But in other ways this ratio is similar to traditional gearing: a higher figure means shareholders' returns are more leveraged to the enterprise's underlying performance and so more risky. In future, debt/market capitalization and interest cover will be Lex's preferred yardsticks.

### EXHIBIT 18.2 Goodbye gearing

Source: *Financial Times* 9 October 1995

## The effect of gearing

The introduction of interest-bearing debt 'gears up' the returns to shareholders. Compared with those of the ungeared firm the geared firm's returns to its owners are subject to greater variation than underlying earnings. If profits are high, the geared firm's shareholders will experience a more than proportional boost in their returns compared to the ungeared firm's shareholders. If profits turn out to be low the geared firm's shareholders will find their returns declining to an exaggerated extent.

The effect of gearing can best be explained through an example. Harby plc is shortly to be established. The prospective directors are considering three different capital structures which will all result in £10m of capital being raised.

- 1 All equity – 10 million shares sold at a nominal value of £1.
- 2 £3m debt (carrying 10 percent interest) and £7m equity.
- 3 £5m debt (carrying 10 percent interest) and £5m equity.

To simplify their analysis the directors have assigned probabilities to three potential future performance levels (see Table 18.2).

**TABLE 18.2**  
**Probabilities of performance levels**

Customer response to firm's products	Income before interest*	Probability (%)
Modest success	£0.5m	20
Good response	£3.0m	60
Run-away success	£4.0m	20

\* Taxes are to be ignored.

We can now examine what will happen to shareholder returns for each of the gearing levels.

Note, in Table 18.3, what happens as gearing increases: the changes in earnings attributable to shareholders is magnified. For example, when earnings before interest rise by 500 percent from £0.5m to £3.0m the returns on the 30 percent geared structure rises by 1,200 per cent from 3 percent to 39 percent. This magnification effect works in both positive and negative directions – if earnings before interest are only £0.5m the all-equity structure gives shareholders some return, but with the 50 percent geared firm they will receive nothing. Harby's shareholders would be taking a substantial risk that they would have no profits if they opted for a high level of gearing.

**TABLE 18.3**  
**The effect of gearing**

Customer response	Modest	Good	Run-away
Earnings before interest	£0.5m	£3.0m	£4.0m
<i>All-equity structure</i>			
Debt interest at 10%	0.0	0.0	0.0
Earnings available for shareholders	£0.5m	£3.0m	£4.0m
Return on shares	$\frac{£0.5m}{£10m} = 5\%$	$\frac{£3.0m}{£10m} = 30\%$	$\frac{£4.0m}{£10m} = 40\%$
<i>30% gearing (£3m debt, £7m equity)</i>			
Debt interest at 10%	£0.3m	£0.3m	£0.3m
Earnings available for shareholders	£0.2m	£2.7m	£3.7m
Return on shares	$\frac{£0.2m}{£7m} = 3\%$	$\frac{£2.7m}{£7m} = 39\%$	$\frac{£3.7m}{£17m} = 53\%$
<i>50% gearing (£5m debt, £5m equity)</i>			
Debt interest at 10%	£0.5m	£0.5m	£0.5m
Earnings available for shareholders	0.0	£2.5m	£3.5m
Return on shares	$\frac{£0.0m}{£5m} = 0\%$	$\frac{£2.5m}{£5m} = 50\%$	$\frac{£3.5m}{£5m} = 70\%$

As the gearing levels rise for Harby, the expected return to shareholders (weighted average of the possible outcomes) also rises, but this is accompanied by a rising level of risk. Management need to weigh up the relative importance of the 'good' resulting from the increase in expected returns and the 'bad' from the wider dispersion of returns attributable to shareholders.

## Business risk and financial risk

*Business risk* is the variability of the firm's operating income, that is, the income before interest. In the case of Harby this is found by examining the dispersion of returns for the all-equity capital structure. This dispersion is caused purely by business-related factors, such as the characteristics of the industry and the competitive advantage possessed by the firm within that industry. This risk will be influenced by factors such as the variability of sales volumes or prices over the business cycle, the variability of input costs, the degree of market power and the level of growth.

The business risk of a monopoly supplier of electricity, gas or water is likely to be significantly less than that for, say, an entrepreneurial company trying to gain a toehold in the internet optical switch market. The range of possible demand levels and prices is likely to be less for the utilities than for the hi-tech firm. Business risk is determined by general business and economic conditions and is not related to the firm's financial structure.

*Financial risk* is the additional variability in returns to shareholders that arises because the financial structure contains debt.

Table 18.3 implies that firms with low business risk can take on relatively high levels of financial risk without exposing their shareholders to excessive total risk. The increased expected return more than compensates for the higher variability resulting in climbing share prices.

## Financial distress

A major disadvantage for a firm taking on higher levels of debt is that it increases the risk of financial distress, and ultimately liquidation. This may have a detrimental effect on both the equity holders and the debt holders.

Financial distress: where obligations to creditors are not met or are met with difficulty.

The risk of incurring the costs of financial distress has a negative effect on a firm's value, which offsets the value of tax relief of increasing debt levels – see Chapter 10 for a discussion of the 'tax shield' effect of debt. These costs become considerable with very high gearing. Even if a firm manages to avoid liquidation its relationships with suppliers, customers, employees and creditors may be seriously damaged. Suppliers providing goods and services on credit are

likely to reduce the generosity of their terms, or even stop supplying altogether, if they believe that there is an increased chance of the firm not being in existence in a few months' time. The situation may be similar with customers. Many customers expect to develop close relationships with their suppliers, and plan their own production on the assumption of a continuance of that relationship. If there is any doubt about the longevity of a firm it will not be able to secure high-quality contracts. For example, car assembly companies develop close relationships with component suppliers – the car producers will not make that effort if there is a doubt about the financial stability of a supplier. In the consumer markets customers often need assurance that firms are sufficiently stable to deliver on promises, for example package holiday companies taking bookings six months in advance. When NTL, the cable company, went through a financial reconstruction because it was heavily borrowed and unable to service its debts in 2002, it lost more than 800 customers a day. Not only were existing customers doubtful about the continuation of the company but the shortage of cash meant a cut in advertising and other expenditure on winning new customers. Employees may become demotivated in a struggling firm as they sense increased job insecurity and few prospects for advancement. The best staff will start to move to posts in safer companies. Bankers and other lenders will tend to look upon a request for further finance from a financially distressed company with a prejudiced eye – taking a safety-first approach – and this can continue for many years after the crisis has passed. They may also insist on restriction on managerial freedom of action. In 2003, for example, Waterford Wedgewood was told by its bankers to reduce stock levels, to undertake no further capital expenditure other than what was already under way, to issue a high-yield bond to replace some of the bank debt, and to not pay an interim dividend. Management find that much of their time is spent 'fire fighting' – dealing with day-to-day liquidity problems – and focussing on short-term cash flow rather than long-term shareholder wealth. Often companies are forced to sell off their most profitable operations in a desperate attempt to raise cash. For instance, in 2003 Fiat put up for sale its most valuable businesses (eg. Fiat Avio) to raise enough cash to allow it to continue producing cars.

The indirect costs associated with financial distress can be much more significant than the more obvious direct costs such as paying for lawyers and accountants and for refinancing programs. Some of these indirect and direct costs are shown in Table 18.4.

As the risk of financial distress rises with the gearing ratio shareholders (and lenders) demand an increasing return in compensation. The important issue is at what point does the probability of financial distress so increase the cost of equity and debt that it outweighs the benefit of the tax relief on debt? Figure 18.8 shows that there is an optimal level of gearing. At low levels of debt the major influence on the overall cost of capital (the WACC – weighted average cost of capital) is the cheaper after-tax cost of debt. As gearing rises investors become more concerned about the risk of financial distress and therefore the

**TABLE 18.4**  
**Costs of financial distress**

Indirect examples	Direct examples
Uncertainties in customers' minds about dealing with this firm – lost sales, lost profits, lost goodwill.	Lawyers' fees.
Uncertainties in suppliers' minds about dealing with this firm – lost inputs, more expensive trading terms.	Accountants' fees.
If assets have to be sold quickly the price may be very low.	Court fees.
Delays, legal impositions, and the tangles of financial reorganization may place restrictions on management action, interfering with the efficient running of the business.	Management time.
Management may give excessive emphasis to short-term liquidity, e.g. cut R&D and training, reduce trade credit and stock levels.	
Temptation to sell healthy businesses as this will raise the most cash.	
Loss of staff morale, tendency to examine possible alternative employment.	
To conserve cash, lower credit terms are offered to customers, which impacts on the marketing effort.	

required rates of return rise. The fear of loss factor becomes of overriding importance at high gearing levels. (There is more on this relationship in Chapter 10.)

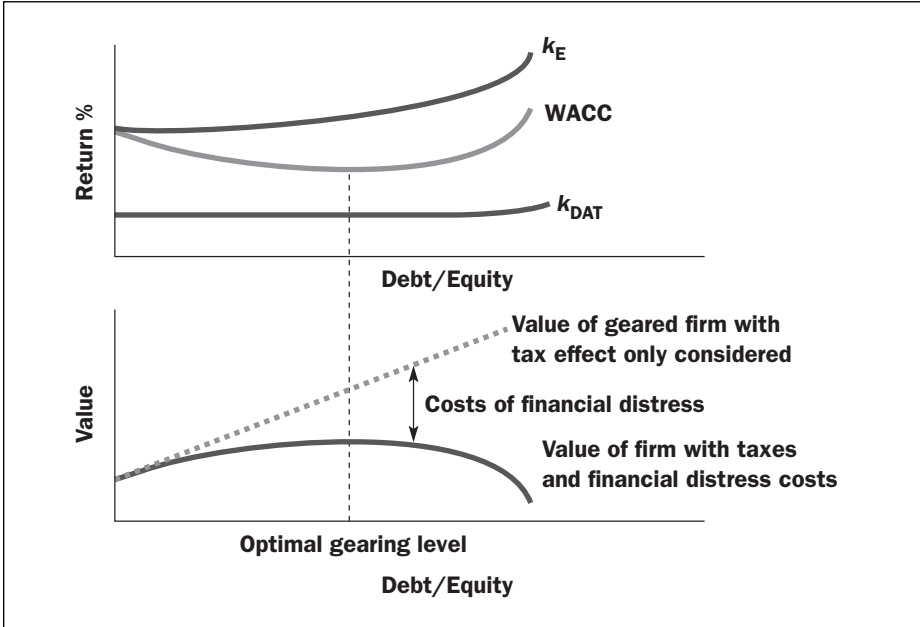
### Some factors influencing the risk of financial distress costs

The susceptibility to financial distress varies from company to company. Here are some influences:

- *The sensitivity of the company's revenues to the general level of economic activity* If a company is highly responsive to the ups and downs in the economy, shareholders and lenders may perceive a greater risk of liquidation and/or distress and demand a higher return in compensation for gearing compared with that demanded for a firm which is less sensitive to economic events.
- *The proportion of fixed to variable costs* A firm that is highly operationally geared, and which also takes on high borrowing, may find that equity and debt holders demand a high return for the increased risk.
- *The liquidity and marketability of the firm's assets* Some firms invest in a type of asset which can be easily sold at a reasonably high and certain value should they go into liquidation. This is of benefit to the financial security holders and so they may not demand such a high risk premium. A hotel chain, for example, should it suffer a decline in profitability, can usu-



**FIGURE 18.8**  
**The cost of capital and the value of the firm with taxes and financial distress, as gearing increases**



ally sell hotels in a reasonably active property market. Investors in an advertising agency, with few saleable assets, would be less sanguine about rises in gearing.

- *The cash-generative ability of the business* Some firms produce a high regular flow of cash and so can reasonably accept a higher gearing level than a firm with lumpy and delayed cash inflows.

Table 18.5 illustrates that the optimal gearing level for firms shifts depending on key characteristics of the underlying business.

Exhibit 18.3 shows two companies with bombed-out share prices, in part due to excessive borrowing to speculate on mobile telecommunication. High-risk ventures with very uncertain cash flows should be financed with a high proportion of equity capital rather than debt.

**TABLE 18.5**

**The characteristics of the underlying business influences the risk of liquidation/distress, and therefore WACC, and the optimal gearing level**

Characteristic	Food retailer	Steel producer
Sensitivity to economic activity	Relatively insensitive to economic fluctuations	Dependent on general economic prosperity
Operational gearing	Most costs are variable	Most costs are fixed
Asset liquidity	Shops, stock, etc., easily sold	Assets have few/no alternative uses. Thin secondhand market
Cash-generative ability	High or stable cash flow	Irregular cash flow
Likely acceptable gearing ratio	<b>HIGH</b>	<b>LOW</b>

## Debt troubles dog European telecom giants

Aline van Duyn

There may be many differences between France Telecom and Deutsche Telekom, but the two operators have one crucial similarity – neither has tackled the debt mountains built up through acquisitions and expensive third-generation mobile phone licences in Europe.

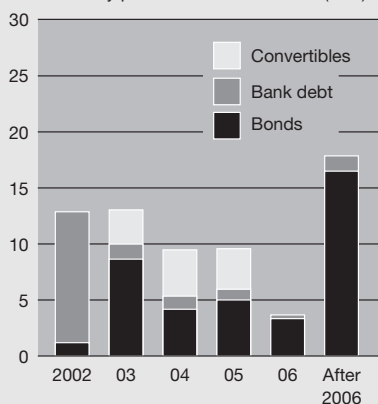
By now, their debts should have been falling. Instead, they have risen and could increase further, not least from a mounting interest bill. The burden is

heavy and shares in both companies are touching all-time lows.

‘France Telecom and Deutsche Telekom are the only operators that have not yet resolved their debt problems,’ says Laura Winchester, telecommunications analyst at Barclays Capital. ‘There is a feeling in the market that both may need to do something to prevent things getting worse.’

### France Telecom

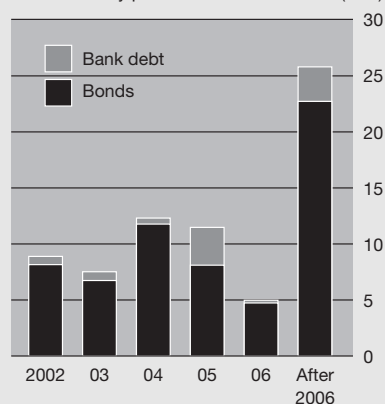
Debt maturity profile as of Dec 31 2001 (€bn)



Source: Barclays Capital

### Deutsche Telekom

Debt maturity profile as of Mar 31 2002\* (€bn)



\*Pro forma based on Q1 2002 new issuance and change in cash balance

At the end of last year, France Telecom had net debt of €60.7bn (£39bn); now it is closer to €67bn. Deutsche Telekom had net debt of €63.5bn in December, which hit €67.3bn by the end of March.

Both companies face increases in their borrowings as they are forced to honour agreements to buy shares in subsidiaries or partners. Meanwhile, weak equity markets mean that plans to sell assets have been put on hold.

The uncertainty is reflected in the credit ratings of the two operators, with more pressure on the French operator.

Both companies are rated Baa1 by Moody's Investors Service and BBB+ by Standard & Poor's. Deutsche Telekom has a negative outlook from Moody's. However, France Telecom is on review for further downgrades, with Moody's having indicated it might cut its ratings by up to two notches, bringing it to the investment grade threshold. A decision is expected in the coming weeks.

Though many analysts expect France Telecom's ratings to remain

investment grade, because the French government owns 55 per cent of the company, it could still face liquidity problems. It has €13bn of debt maturing this year and next, including €12bn in the bond markets. This could be an expensive exercise.

France Telecom has said that, in the worst case, its net debt would stand at €58.3bn by the end of next year. But many analysts disagree with that forecast.

Duncan Warwick-Champion, telecoms credit analyst at UBS Warburg, estimates its debt will be €69.3bn at the end of 2003. Mr Warwick-Champion, previously an analyst at S&P, says year-end debt was €63.2bn and not the €60.7bn reported, because the leasing of real estate should be included. He also forecasts lower returns from the sale of stock, the Italian unit Wind and property disposals. 'Only the announcement of a significant rights issue is likely to stop the ratings agencies lowering France Telecom's ratings,' he says.

### EXHIBIT 18.3 Debt troubles dog European telecom giants

Source: *Financial Times* 14 June 2002

## Agency costs

Another restraining influence on the decision to take on high debt is the agency cost of doing so. Agency costs arise out of what is known as the 'principal-agent' problem. In most large firms the finance providers (principals) are not able to actively manage the firm. They employ 'agents' (managers) and it is possible for these agents to act in ways that are not always in the best interests of the equity or debt holders.

Costs of preventing agents (e.g. managers) pursuing their own interests at the expense of their principals (e.g. shareholders). Examples include contracting costs and costs of monitoring. In addition, there is the agency cost of the loss of wealth caused by the extent to which prevention measures have not worked and managers continue to pursue non-shareholder wealth goals.

If management are acting for the maximization of shareholder wealth debt holders may have reason to fear agency problems, because there may be actions that potentially benefit the owners at the expense of lenders. It is possible for

lenders to be fooled or misled by managers. For example, management might raise money from bondholders saying that this is low-risk lending (and therefore paying a low interest rate) because the firm has low gearing and the funds will be used for a low-risk project. In the event the managers invest in high-risk ventures, and the firm becomes more highly geared by borrowing more. As a result the original lenders do not receive a return sufficient for the level of risk and the firm has the benefit of low-interest financing.

Alternatively, consider a firm already in financial distress. From the shareholders' point of view there is little to lose from taking an enormous gamble by accepting very high-risk projects. If the gamble pays off the shareholders will win but the debt holders will gain no more than the obligated fixed interest. If it fails, the shareholders are no worse off but the lenders experience default on their securities.

The problem boils down to one of *information asymmetry* – that is, the managers are in possession of knowledge unavailable to the debt providers. One of the solutions is to spend money on monitoring. The lenders will require a premium on the debt interest to compensate for this additional cost. Also restrictions (covenants) are usually built into a lending agreement. For example, there may be limits on the level of dividends so that shareholders do not strip the company of cash. There may be limits placed on the overall level of indebtedness, with precise capital and income-gearing ratios. Managers may be restricted in the disposal of major assets or constrained in the type of activity they may engage in.

Extensive covenants imposed by lenders can be costly for shareholders because they reduce the firm's operating freedom and investment flexibility. Projects with a high NPV may be forgone because of the cautiousness of lenders. The opportunity costs can be especially frustrating for firms with high growth potential.

Thus agency costs include monitoring costs passed on as higher interest rates and the loss of value caused by the inhibition of managerial freedom to act. These increase with gearing, raising the implicit cost of debt and lowering the firm's value.

There may also be a psychological element related to agency costs; managers generally do not like restrictions placed on their freedom of action. They try to limit constraints by not raising a large proportion of capital from lenders. This may help to explain why, in practice, we find companies generally have modest gearing levels.

## **Borrowing capacity**

Borrowing capacity has a close connection with agency costs. Lenders prefer secured lending, and this often sets an upper limit on gearing. They like to have the assurance that if the worst happened and the firm was unable to meet its interest obligations they could seize assets to sell off so that loans could be repaid. Thus, high levels of gearing are unusual because companies run out of suitable assets to offer as security against loans. So, the gearing level may not be determined by a theoretical, informed and considered management decision, but by the limits to total borrowing imposed by lenders.

Firms with assets which have an active secondhand market, and which do not tend to depreciate, such as property, are likely to have a higher borrowing capacity than firms that invest in assets with few alternative uses.

## Pecking order

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There is a 'pecking order' for financing. Firms prefer to finance with internally generated funds. If a firm has potentially profitable investments it will first of all try to finance the investments by using the store of previous years' profits, that is, retained earnings. If still more funds are needed, firms will go to the capital markets. However, the debt market is called on first, and only as a last resort will companies raise equity finance. Myers (1984, p. 581) puts it this way: 'In this story, there is no well-defined target debt–equity mix, because there are two kinds of equity, internal and external, one at the top of the pecking order and one at the bottom.'

One reason for placing new issues of equity at the bottom is supposedly that the stock markets perceive an equity issue as a sign of problems – an act of desperation. Bennett Stewart (1990, p. 391) puts it: 'Raising equity conveys doubt. Investors suspect that management is attempting to shore up the firm's financial resources for rough times ahead by selling over-valued shares.' The pecking order idea helps to explain why the most profitable companies often borrow very little. It is not that they have a low target debt ratio, but because they do not need outside finance. If they are highly profitable they will use these profits for growth opportunities and so end up with very little debt and no need to issue shares.

Less profitable firms with an extensive investment program issue debt because they do not have internal funds sufficient for their capital investment program and because debt is first in the pecking order of externally raised finance.

There is an argument that firms do not try to reach the 'correct' capital structure as dictated by theory, because managers are following a line of least resistance. Internal funds are the first choice because using retained earnings does not involve contact with outside investors. This avoids the discipline involved in trying to extract investors' money. For example, the communication process required to raise equity finance is usually time consuming and onerous, with a formal prospectus, etc., and investors will scrutinize the detailed justifications advanced for the need to raise additional finance. It seems reasonable to suppose that managers will feel more comfortable using funds they already have in their hands. However, if they do have to obtain external financing then debt is next in the line of least resistance. This is because the degree of questioning and publicity associated with a bank loan or bond issue is usually significantly less than that associated with a share issue.

Another reason for a pecking order is that ordinary shares are more expensive to issue than debt capital, which in turn is more expensive than simply applying previously generated profits. The costs of new issues and rights issues of shares can be very expensive, whereas retained earnings are available without transaction costs.

Exhibit 18.4 shows that rights issues (particularly 'rescue' rights issues designed to save the company from the danger of liquidation) can be viewed in a very negative light by the financial markets.

## Companies go back to basics in search for cash

Arkady Ostrovsky

Two French groups yesterday joined the lengthening queue of cash-hungry European companies lining up to raise money from shareholders through rights issues.

Scor, the reinsurer, plans a capital increase of €400m (£251.2m) – equivalent to its market capitalisation – but the move was poorly received and the company's shares tumbled by a third. Meanwhile, Bouygues Telecom said it was looking to launch a rights issue to pay for its €619m licence to operate a third-generation mobile phone network.

Rights issues, offerings of new shares to existing shareholders on a pro-rata basis to their holdings – have been the most popular way for companies to raise money this year. Shareholders can either subscribe to a rights issue or reject it, depending on their view of the company's future. But when stock markets are tumbling and other sources of financing have dried up, it can be a life-and-death choice for a company.

'For a number of highly geared companies, bond markets have been, in effect, shut this year, the IPO market is dry and banks are reluctant to lend long-term money to indebted companies, so companies have no choice but to ask shareholders for money,' says James Renwick, European head of

equity capital markets at UBS Warburg.

'Rights issues are the most basic way of raising money, which companies undertook before capital markets were properly developed. But when times get tough, companies go back to basics,' says Dante Roscini, global co-head of equity capital markets at Merrill Lynch.

Insurers, whose investment portfolios have been hit by stock market falls, and telecommunications companies, many of which are struggling under a debt mountain, are leading the way.

Those that have raised money include Ericsson, Sonera, Zurich Financial Services and Legal & General.

'European companies are facing up to reality. Volatility is at record high levels and a rescue rights issue is likely to be the only way of restructuring balance sheets in the short to medium term,' says Mr Renwick.

Not all rights issues are rescue financing, however. Kingfisher, the UK retailer, and Imperial Tobacco, used them to help pay for acquisitions.

There is little doubt that a rising level of rights issues is a sign of desperation on the part of many companies. But it is also the first step towards balance sheet restructurings and the reducing of debt, which, ultimately, should lead to the revival of equity capital markets.

### EXHIBIT 18.4 Companies go back to basics in search for cash

Source: *Financial Times* 1 October 2002

## Financial slack

Operating and strategic decisions are generally the prime determinants of company value, not the financing decision. Being able to respond to opportunities as they fleetingly appear in business is important. If a firm is already highly geared it may find it difficult to gain access to more funds quickly as the need arises. Financial slack means having cash (or near-cash) and/or spare debt capacity. This slack can be extremely valuable and firms may

**Financial slack means having cash (or near-cash) and/or spare debt capacity.**

restrict debt levels below that of the 'optimal' gearing level in order that the risk of missing profitable investments is reduced.

Financial slack is also valuable for meeting unforeseen circumstances. Managers may wish to be cautious and have a reserve of cash or spare borrowing capacity to cope with a 'rainy day'.

## Signaling

Managers and other employees often have a very powerful incentive to ensure the continuance of the business. They are usually the people who suffer most should it become insolvent. Because of this, it is argued, managers will generally increase the gearing level only if they are confident about the future. Shareholders are interested in obtaining information about the company's prospects, and changes in financing can become a signal representing management's assessment of future returns. Ross (1977) suggests that an increase in gearing should lead to a rise in share price as managers are signaling their increased optimism. Managers, therefore, need to consider the signal transmitted to the market concerning future income whenever it announces major gearing changes.

## Control

The source of finance chosen may be determined by the effect on the control of the organization. For example, if a shareholder with 50 percent of a company's shares is unable to pay for more shares in a rights issue, he or she may be reluctant to allow the company to raise funds in this way, especially if shares are sold to a rival. This limits the range of sources of finance and may lead to a rise in debt levels.

## Some further thoughts on debt finance

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There are some intriguing ideas advanced to promote the greater use of debt in firms' capital structure. Three of them will be considered here.

### Motivation

High debt will motivate managers to perform better and in the interests of shareholders. Consider this thought: if an entrepreneur (an owner-manager) wishes to raise finance for expansion purposes, debt finance is regarded as the better choice from the perspective of entrepreneurs and society. The logic works like this: if new shares are sold to outside investors, this will dilute the entrepreneur's control and thus the level of interest of the entrepreneur in the success of the business. The firm will be run less efficiently because of reduced effort by the key person.

Or consider this argument: Bennett Stewart argues that in firms without a dominant shareholder and with a diffuse shareholder base, a recapitalization which substitutes debt for equity can result in the concentration of the shares in the hands of a smaller, more proactive group. These shareholders have a greater incentive to monitor the firm. (If managers are made part of this shareholder owning group there is likely to be a greater alignment of shareholder and managers' interests.) Large quoted firms often have tens of thousands of shareholders, any one of whom has little incentive to go to the expense of opposing managerial action detrimental to shareholders' interests – the costs of rallying and co-ordinating investors often outweigh the benefits to the individuals involved. However, if the shareholder base is shrunk through the substitution of debt for equity, the remaining shareholders would have greater incentive to act against mismanagement. An extreme form of this switch to concentration is when a management team purchases a company through a leveraged buyout or buy-in. Here a dispersed, divided and effectively powerless group of shareholders is replaced with a focussed and knowledgeable small team, capable of rapid action and highly motivated to ensure the firm's success.

### Reinvestment risk

High debt forces the firm to make regular payments to debt holders, thereby denying 'spare' cash to the managers. In this way the firm avoids placing a temptation in the manager's path, which might lead to investment in negative NPV projects and to making destructive acquisitions. Deliberately keeping managers short of cash avoids the problem that shareholders' funds may be applied to projects with little thought to returns. If funds are needed, instead of drawing on a large pot held within the firm, managers have to ask debt and equity finance providers. This will help to ensure that their plans are subject to the scrutiny and discipline of the market.

The problem of managers over-supplied with money, given the limited profitable investment opportunities open to them, seems to be widespread, but specific examples are only clearly seen with hindsight. For example, in the 1990s GEC was a cash rich company under Arnold Weinstock. New managers changed the name to Marconi and spent billions buying high technology communication infrastructure companies working at the cutting-edge, but with little in the way of certainty over the likely future demand for the services/goods they offered – hope of a glorious future was all that was needed for the spending of the large pot of money as well as additional borrowings. When demand projections were shown to be hopelessly optimistic the company barely survived – shareholder value was destroyed on a massive scale.

**Hope of a glorious future was all that was needed for the spending of the large pot of money.**

The danger of poor investment decisions is at its worst in firms that are highly profitable but which have few growth opportunities. The annual surplus cash flow is often squandered on increasingly marginal projects within existing SBUs



or wasted in a diversification effort looking to buy growth opportunities: unfortunately these often cost more than they are worth. It is far better, say Stewart (1990), Hart (1995), Jensen (1986) and others, that managers are forced to justify the use of funds by having to ask for it at regular intervals. This process can be assisted by having high debt levels which absorb surplus cash through interest and principal payments and deposit it out of the reach of empire-building, perk-promoting, lazy managers.

### Operating and strategic efficiency

‘Equity is soft; debt is hard. Equity is forgiving; debt is insistent. Equity is a pillow; debt is a dagger.’ This statement by Bennett Stewart (1990, p. 580) emphasizes that operating and strategic problems and inefficiencies are less

**Equity is soft; debt is hard.**

likely to be attended to and corrected with a capital base that is primarily equity. However, the managers of a highly geared company are more likely to be attuned to the threat posed by falling efficiency and profitability. The failing is the same under both a high equity and a high debt structure: it just seems more of a crisis when there is a large interest bill each month. The geared firm, it is argued, simply cannot afford to have any value-destructive activities (SBUs or product lines). Managers are spurred on by the pressing need to make regular payments, to reform, dispose or close – and quickly.

These are some of the arguments put forward, particularly in the USA in the era of massive leveraged buyouts (LBOs), junk bonds and share repurchase programs (in the 1980s and 1990s), in support of high debt. They seem to make some sense, but the downside of excessive debt must be balanced against these forcefully advanced ideas. Turning back to Table 18.4, which shows the costs of financial distress, can help to give some perspective. In addition, many firms have found themselves crippled and at a competitive disadvantage because of the burden of high debt – e.g. Marconi is a shadow of its former self, as is Cable and Wireless and Vivende Universal.

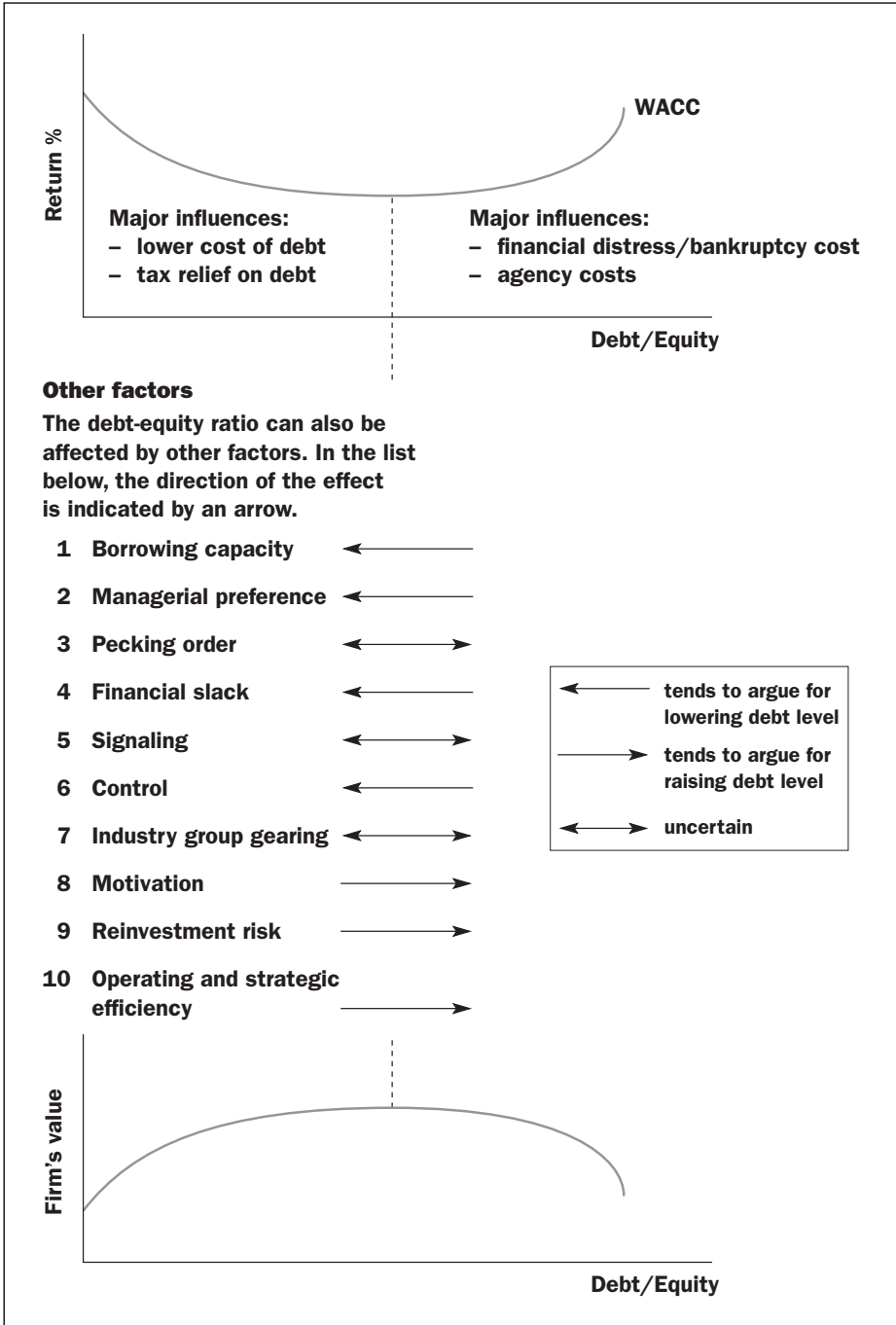
### Rounding up the capital structure arguments

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The proportion of debt in the total capital of a firm can influence the overall cost of capital and therefore the value of the firm and the wealth of shareholders. If, as a result of increasing the gearing ratio, it is possible to lower the weighted average cost of capital, then all the future net cash flows will be discounted at a lower rate. It is generally observed that as gearing increases, the WACC declines because of the lower cost of debt. This is further enhanced by the tax relief available on debt capital.

**FIGURE 18.9**

The weighted average cost of capital is U-shaped and value can be altered by changing the gearing level



But as gearing rises the risk of financial distress causes shareholders (and eventually debt holders) to demand a greater return. This eventually rises to such an extent that it outweighs the benefit of the lower cost of debt, and the WACC starts to rise. This risk factor is difficult, if not impossible, to quantify and therefore the exact position and shape of the WACC curve for each firm remains largely unknown. Nevertheless, it seems reasonable to postulate there is a U-shaped relationship like that shown in Figure 18.9.

We cannot scientifically establish a best debt–equity ratio. There are many complicating factors that determine the actual gearing levels adopted by firms. These cloud the picture sufficiently for us to say that while we accept that the WACC is probably U-shaped for firms generally, we cannot precisely calculate a best gearing level.

This explains why there is such a variation in gearing levels. Some firms are under the influence of particular factors to a greater extent than other firms: some may have very low borrowing capacity, and others may have management keen on signaling confidence in the future; some may have very cautious management unwilling to borrow and a diffuse unco-ordinated shareholder body; some may be in very volatile product markets with high liquidation probabilities and others in stable industries with marketable tangible assets; other companies may be dominated by leaders steeped in the high gearing thinking of the late 1980s and early 1990s, believing that managers are better motivated and less likely to waste resources if the firm is highly indebted.

So, to the question of whether a firm can obtain a level of gearing which will maximize shareholder wealth the answer is ‘yes’. The problem is finding this level in such a multifaceted analysis.

Exhibit 18.5 discusses the importance of adjusting the debt level.

## Relieving the debt hangover by giving a fine tune to the accounts

Adrienne Roberts

*Much as dyspeptic revellers flock to ‘detox’ remedies after Christmas, the corporate world has spent the past two years remedying its debt hangover. ‘Balance sheet repair’ has been its response to the toxic levels of debt that triggered record numbers of credit rating downgrades in 2002 and brought a slew of companies to the brink of bankruptcy. But even for less indebted companies, balance sheet fine-tuning can make sense.*

### **What is balance sheet repair?**

Corporate finance advisers talk about balance sheet repair, reform, restructuring and even ‘sculpting’. Broadly, they all boil down to finding the right capital structure for a company, given its business objectives and market conditions.

Simon Collins, at KPMG Corporate Finance, says: ‘The question to ask is: Is your business dictating your financing structure or is your financing structure dictating the way you do business?’

### **When is financing structure dictating your business?**

One example is capital expenditure constraints. It is one of the first items businesses have to rein in when trying to get debt under control, and this can retard growth.

Credit rating downgrades are another symptom, as too much debt increases credit risk.

Covenants on the company's debt could also be cramping its style.

Covenants require the borrower to do certain things or prohibit it from doing others.

If the business finds itself having to throttle back on spending in the second half of each year for fear of breaching covenants, this could mean it has an inappropriate capital structure.

### **What does balance sheet repair involve?**

Balance sheet repair can mean paying down debt, replacing one kind with another or even borrowing more. It also involves decisions such as looking at which debt markets to tap and what kind of covenant protection the company is willing to give its creditors.

### **Can a company have too little debt?**

In the past two years the most urgent balance sheet repair has involved cutting debt levels. But it is also possible to be under-leveraged.

A company with too little debt may have too high a weighted average cost of capital. This is because debt financing is cheaper than equity: interest payments are tax deductible but dividends are not. One implication of this is that an under-leveraged balance sheet is less tax-efficient.

Other signs of under-leverage include having an unnecessarily high credit rating compared with the peer group.

### **Shouldn't you always aim for the highest possible rating?**

Not necessarily. It all comes back to the relative cost of debt and equity. Many ratings advisers tell their clients to find the 'sweet spot' on their balance sheet.

That is where the company is minimising its weighted average cost of capital and working its equity harder, but has not taken on so much debt as to raise concerns about creditworthiness. Some studies suggest the 'sweet spot' is about a high triple B rating, towards the bottom of the 'investment grade' ratings category.

But it depends on the company. For some, it still makes sense to defend a higher rating. For example, a contractor or a facilities management provider bidding for long-term contracts may need a strong credit rating to signal it has stable long-term prospects.

### **Which debt market should companies choose?**

Companies need to source their financing according to their business and their long term goals.

For example, a utility company building a power plant might do well to issue a 10-year bond to lock in good borrowing rates. But a retail chain's working capital cycle might dictate its financing requirement.

A retailer that builds inventories to a peak in August, then sells all its stock in the run-up to Christmas would be better served by a bank facility.

Tapping the bond market would be more expensive, because it would mean paying interest all year on cash that is only needed for six months.

### **What about covenants?**

Covenants are meant to protect the interests of the lender without unduly restricting the operating and strategic decisions of the borrower.

They are more common in banking facilities than bonds, but bond investors are becoming increasingly insistent on covenant protection.

If a company breaches its covenants – for example if its earnings dip and it fails the interest cover test – it may be deemed to have defaulted. This could mean a penalty interest rate or having to repay the whole bond or loan immediately.

## **EXHIBIT 18.5** Relieving the debt hangover by giving a fine tune to the accounts

Source: *Financial Times* 27 January 2004

## Conclusion

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The main focus of this chapter has been on the proportion of debt to equity and the type of debt finance that is most suitable for the company. These ideas and principles must be read with the knowledge of the characteristics of different types of finance in Chapters 15, 16 and 17, and with an understanding of the calculation of the cost of capital (Chapter 10). Each company faces different circumstances and so the most appropriate mixture of finance, with its concomitant risks, is likely to be different from other companies, even those in the same industry. The tools provided in this chapter will hopefully allow a thoughtful discussion when contemplating the best debt level and mixture of debt-types for your firm.

## Websites

[www.treasurers.org](http://www.treasurers.org) Association of Corporate Treasurers  
[www.ft.com](http://www.ft.com) Financial Times

## Notes

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- 1 However there are long periods (years) when yield curves show interest rates lower 'at the long end' than 'at the short end'.
- 2 Assume no hedging in the derivative or money markets.
- 3 Quoted in 'Bristol Water plans to return £50m cash' by Rebecca Bream, *Financial Times*, 22 July 2003.
- 4 From 'Next shines brighter as a high street star' by Susanna Voyle, *Financial Times*, 13 September 2002.
- 5 'M&S gives details of cash return' by Susanna Voyle, *Financial Times*, 24 January 2002.
- 6 Paul Pindar, chief executive, quoted in 'Capita shares recover on buy-back plans' by James Politi, *Financial Times*, 8 October 2002.
- 7 These problems also apply to capital gearing measures (2) and (3).
- 8 To make this discussion easier to follow it will be assumed that there are only two types of finance, debt and ordinary shares. However, the introduction of other types of finance does not fundamentally alter the analysis.
- 9 Net worth (or shareholders' equity) divided by Debt plus equity there is another popular capital gearing ratio.
- 10 On the other hand Jensen (1986) has argued that if managers have less free cash flow they are less likely to invest in negative NPV projects, and this restraint is better for shareholders.

## OPTIONS

**Introduction**

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**What is a derivative?**

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**A long history**

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**What is an option?**

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**Share options**

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**Index options**

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**Corporate uses of options**

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**Real options**

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**Conclusion**

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## Introduction

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Derivatives – options, futures, forwards, etc. – are the subject of this chapter and the next two. Derivative instruments have become increasingly important for companies over the last 20 years. Managers can exploit these powerful tools to either reduce risk or to go in search of high returns. Naturally, exceptionally

**Exceptionally high returns come with exceptionally high risk.**

high returns come with exceptionally high risk. So managers using derivatives for this purpose need to understand the risk they are exposing their company to. Many companies have lost fortunes by allowing

managers to be mesmerized by the potential for riches while failing to take time to fully understand the instruments they were buying. They jumped in, unaware of, or ignoring, the potential for enormous loss. These three chapters describe the main types of derivative and show how they can be used for controlling risk (hedging) and for revving-up returns (speculation).

## What is a derivative?

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A derivative instrument is an asset whose performance is based on (derived from) the behavior of the value of an underlying asset (usually referred to simply as the ‘underlying’). The most common underlyings are commodities (for example tea or pork bellies), shares, bonds, share indices, currencies and interest rates. Derivatives are contracts that give the *right*, and sometimes the obligation, to buy or sell a quantity of the underlying, or benefit in another way from a rise or fall in the value of the underlying. It is the legal right that becomes an asset, with its own value, and it is the right that is purchased or sold.

The derivatives markets have received an enormous amount of attention from the press in recent years. This is hardly surprising as spectacular losses have been made and a number of companies have been brought to the point of collapse using derivatives. Some examples of the unfortunate use of derivatives include:

- Metallgesellschaft, the German metals and services group, which was nearly destroyed in 1994 after losing more than DM2.3bn on energy derivatives;
- Procter & Gamble, which lost \$102m speculating on the movements of future interest rates in 1994;
- Orange County in California, which lost at least \$1.7bn on leveraged interest rate products;
- Barings, Britain’s oldest merchant bank, which lost over £800m on the Nikkei Index (the Japanese share index) contracts on the Singapore and Osaka derivatives exchanges, leading to the bank’s demise in 1995;
- Sumitomo, which lost £1.17bn on copper and copper derivatives over the ten years to 1996;

- **Long-Term Capital Management**, which attempted to exploit the ‘mispricing’ of financial instruments, by making use of option pricing theory. In 1998 the firm collapsed and the Federal Reserve Bank of New York cajoled 14 banks and brokerage houses to put up \$3.6bn to save it, thereby preventing a financial system breakdown.

In many of the financial scandals derivatives have been used (or misused) to speculate rather than to reduce risk. These chapters examine both of these applications of derivatives but places particular emphasis on the hedging (risk-mitigating) facility they provide. These are powerful tools and managers can abuse that power either through ignorance or through deliberate acceptance of greater risk in the anticipation of greater reward. However there is nothing inherently wrong with the tools themselves. If employed properly they can be remarkably effective at limiting risk.

## A long history

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Derivative instruments have been employed for more than two thousand years. Olive growers in ancient Greece unwilling to accept the risk of a low price for their crop when harvested months later would enter into forward agreements whereby a price was agreed for delivery at a specific time. This reduced uncertainty for both the grower and the purchaser of the olives. In the Middle Ages forward contracts were traded in a kind of secondary market, particularly for wheat in Europe. A futures market was established in Osaka’s rice market in Japan in the seventeenth century. Tulip bulb options were traded in seventeenth-century Amsterdam.

Commodity futures trading really began to take off in the nineteenth century with the Chicago Board of Trade regulating the trading of grains and other futures and options, and the London Metal Exchange dominating metal trading.

So derivatives are not new. What is different today is the size and importance of the derivatives markets. The last quarter of the twentieth century witnessed an explosive growth of volumes of trade, variety of derivatives products, and the number and range of users and uses. In the 20 years to 2003 the face value of outstanding derivatives contracts rose dramatically to stand at about US\$120 trillion (US\$120,000,000,000,000). Compare that with the total production of all the goods and services in the UK in a year of around £1 trillion.

**Derivatives are not new. What is different today is the size and importance of the markets.**

## What is an option?

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An option is a contract giving one party the right, but not the obligation, to buy or sell a financial instrument, commodity or some other underlying asset at a given price, at or before a specified date. The purchaser of the option can either exercise the right or let it lapse – the choice is theirs.



A very simple option would be where a firm pays the owner of land a non-returnable *premium* (say £10,000) for an option to buy the land at an agreed price (say, £1m) because the firm is considering the development of a retail park within the next five years. The property developer may pay a number of option premiums to owners of land in different parts of the country. If planning permission is eventually granted on a particular plot the option to purchase may be *exercised*. In other words the developer pays the price agreed at the time that the option contract was arranged to purchase the land (say, £1m). Options on other plots will be *allowed to lapse* and will have no value. By using an option the property developer has 'kept the options open' with regard to which site to buy and develop and, indeed whether to enter the retail park business at all.

Options can also be *traded*. Perhaps the option to buy could be sold to another company keener to develop a particular site than the original option purchaser. It may be sold for much more than the original £10,000 option premium, even before planning permission has been granted.

Once planning permission has been granted the greenfield site may be worth £1.5m. If there is an option to buy at £1m the option right has an *intrinsic value* of £500,000, representing a 4,900 percent return on £10,000. From this we can see the gearing effect of options: very large sums can be gained in a short period of time for a small initial cash outlay.

## Share options

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Share options have been traded for centuries but their use expanded dramatically with the creation of traded option markets in Chicago, Amsterdam and, in 1978, the London Traded Options Market. In 1992 this became part of the London International Financial Futures and Options Exchange, LIFFE (pronounced 'life'). Euronext bought LIFFE in 2002 and it is now officially Euronext.liffe.

A share call option gives the purchaser a right, but not the obligation, to *buy* a fixed number of shares at a specified price at some time in the future. In the case of traded options on Euronext.liffe, one option contract relates to a quantity of 1,000 shares. The seller of the option, who receives the premium, is referred to as the *writer*. The writer of a call option is obligated to sell the agreed quantity of shares at the agreed price some time in the future. American-style options can be exercised by the buyer at any time up to the expiry date, whereas European-style options can only be exercised on a predetermined future date. Just to confuse everybody, the distinction has nothing to do with geography: most options traded in Europe are US-style options.

## Call option holder (call option buyers)

Now let us examine the call options available on an underlying share – Cadbury Schweppes, on 4 February 2004. There are a number of different options available for this share, many of which are not reported in the table presented in the *Financial Times*, part of which is reproduced as Table 19.1.

**TABLE 19.1**  
**Call options on Cadbury Schweppes shares, 4 February 2004**

Exercise price	Call option prices (premiums) pence		
	April	June	September
390p	33.5	35.5	40.5
420p	13.5	17.5	24.0
Share price on 4.2.04 = 416.5p			

Source: *Financial Times*, 5 February 2004. Reprinted with permission.

So, what do the figures mean? If you wished to obtain the right to buy 1,000 shares on or before late June 2004, at an exercise price of 420p, you would pay a premium of £175 ( $1,000 \times 17.5p$ ). If you wished to keep your option to purchase open for another three months you could select the September call. But this right to insist that the writer sells the shares at the fixed price of 420p on or before a date in late September<sup>1</sup> will cost another £65 (the total premium payable on one option contract is £240 rather than £175). This extra £65 represents additional *time value*. Time value arises because of the potential for the market price of the underlying to change in a way that creates intrinsic value. The intrinsic value of an option is the pay-off that would be received if the underlying were at its current level when the option expires. In this case, there is currently (4 February) no intrinsic value because the right to buy is at 420p whereas the share price is 416.5p. However if you look at the call option with an exercise price of 390p then the right to buy at 390p has intrinsic value because if you purchased at 390p by exercising the option, thereby obtaining 1,000 shares, you could immediately sell at 416.5p in the share market: intrinsic value = 26.5p per share, or £265 for 1,000 shares. The longer the time over which the option is exercisable the greater the chance that the price will move to give intrinsic value – this explains the higher premiums on more distant expiry options. Time value is the amount by which the option premium exceeds the intrinsic value.

The two exercise price (also called strike price) levels presented in Table 19.1 illustrate an *in-the-money-option* (the 390 call option) and an *out-of-the-money-option* (the 420 call option). The underlying share price is above the strike price of 390 and so this call option has an intrinsic value of 26.5p and is therefore in-the-money. The right to buy at 420p is out-of-the-money because

the share price is below the option exercise price and therefore has no intrinsic value. The holder of a 420p option would not exercise this right to buy at 420p because the shares can be bought on the stock exchange for 416.5p. (It is sometimes possible to buy an *at-the-money option*, which is one where the market share price is equal to the option exercise price.)

To emphasize the key points: The option premiums vary in proportion to the length of time over which the option is exercisable (e.g. they are higher for a September option than for a June option). Also, call options with a lower exercise prices will have higher premiums.

### Illustration

Suppose that you are confident that Cadbury Schweppes shares are going to rise significantly over the next four-and-a-half months to 700p and you purchase a June 390 call at 35.5 pence.<sup>2</sup> The cost of this right to purchase 1,000 shares is £355 (35.5p × 1,000 shares). If the share rises as expected then you could exercise the right to purchase the shares for a total of £3,900 and then sell these in the market for £7,000. A profit of £3,100 less £355 = £2,745 is made before transaction costs (the brokers' fees, etc. would be in the region of £20–£50). This represents a massive 773 percent rise before costs (£2,745/£355).

However the future is uncertain and the share price may not rise as expected. Let us consider two other possibilities. First, the share price may remain at 416.5p throughout the life of the option. Second, the stock market may have a severe downturn and Cadbury Schweppes shares may fall to 300p. These possibilities are shown in Table 19.2.

**TABLE 19.2**

**Profits and losses on the June 390 call option following purchase on 4 February**

	Assumptions on share price in June at expiry		
	700p	416.5p	300p
Cost of purchasing shares by exercising the option	£3,900	£3,900	£3,900
Value of shares bought	£7,000	£4,165	£3,000
Profit from exercise of option and sale of shares in the market	£3,100	£265	Not exercised
Less option premium paid	£355	£355	£355
Profit (loss) before transaction costs	£2,745	–£90	–£355
Percentage return over 4½ months	773%	–25%	–100%

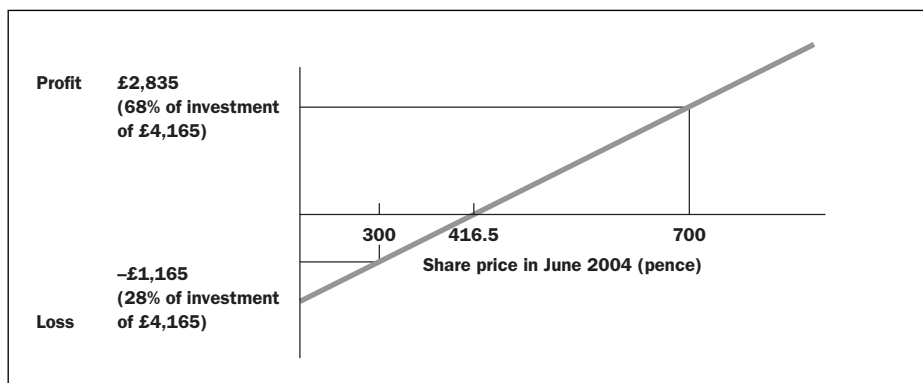
In the case of a standstill in the share price the option gradually loses its time value over the four-and-a-half months until, at expiry, only the intrinsic value of 26.5p per share remains. The fall in the share price to 300p illustrates one of the advantages of purchasing options over some other derivatives: the holder has a right to abandon the option and is not forced to buy the underlying share at the option exercise price – this saves £900. It would have added insult to injury to have to buy at £3,900 and sell at £3,000 after having already lost £355 on the premium for the purchase of the option.

A comparison of Figures 19.1 and 19.2 shows the extent to which the purchase of an option gears up the return from share price movements: a wider dispersion of returns is experienced. On 4 February 2004, 1,000 shares could be bought for £4,165. If the value rose to £7,000, a 68 percent return would be made, compared with a 773 percent return if options are bought. We would all like the higher positive return on the option than the lower one available on the underlying – but would we all accept the downside risk associated with this option? Consider the following possibilities:

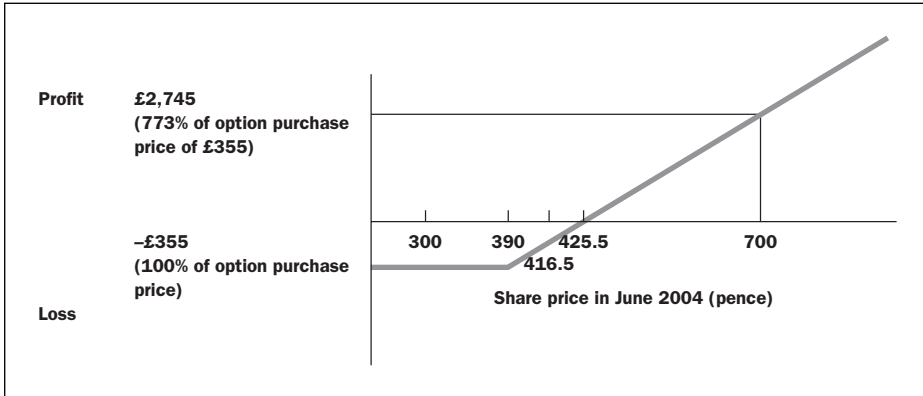
- If share price remains at 416.5p:
  - Return if shares are bought: 0%
  - Return if one 390 June call option is bought: –25% (paid £355 for the option which declines to its intrinsic value of only £265\*)
  - \* £265 is the intrinsic value at expiry  $(416.5p - 390p) \times 1,000 = £265$
- If share price falls to 300p:
  - Return if shares are bought: –28%
  - Return if one 390 June call option is bought: –100% (the option is worth nothing)

**FIGURE 19.1**

**Profit if 1,000 shares are bought in Cadbury Schweppes on 4 February 2004 at 416.5p**



**FIGURE 19.2**  
**Profit if one 390 January call option contract (for 1,000 shares) in Cadbury Schweppes is purchased on 4 February 2004 and held to maturity**



The holder of the call option will not exercise unless the share price is at least 390p. At a lower price it will be cheaper to buy the 1,000 shares on the stock market. Break-even does not occur until a price of 425.5p because of the need to cover the cost of the premium (390p + 35.5p). However at higher prices the option value increases, pence for pence, with the share price. Also the downside risk is limited to the size of the option premium.

**Call option writers**

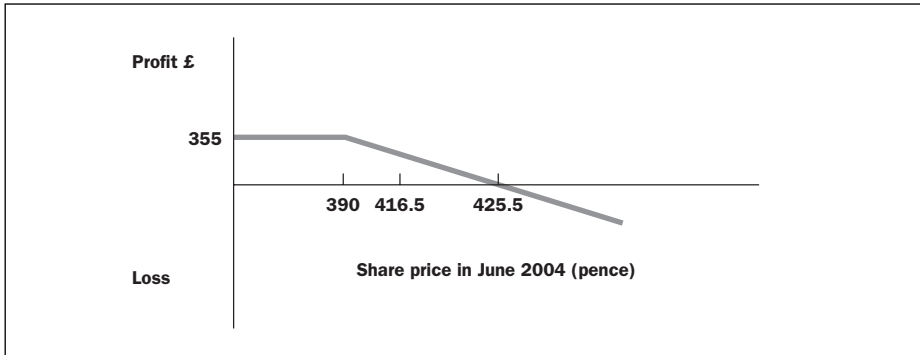
The returns position for the writer of a call option in Cadbury Schweppes can also be presented in a diagram (see Figure 19.3). With all these examples note that there is an assumption that the position is held to expiry.

If the market price is less than the exercise price (390p) in June the option will not be exercised and the call writer profits to the extent of the option premium (35.5p per share). A market price greater than the exercise price will result in the option being exercised and the writer will be forced to deliver 1,000 shares for a price of 390p. This may mean buying shares on the stock market to supply to the option holder. As the share price rises this becomes increasingly onerous and losses mount.

Note that in the sophisticated traded option markets of today very few option positions are held to expiry. In most cases the option holder sells the option in the market to make a cash profit or loss. Option writers often cancel out their exposure before expiry – for example they could purchase an option to buy the same quantity of shares at the same price and expiry date.

FIGURE 19.3

The profit to a call option writer on one 390 June call contract written on 4 February 2004



### An example of an option writing strategy

Joe has a portfolio of shares worth £100,000 and is confident that while the market will go up steadily over time it will not rise over the next few months. He has a strategy of writing out-of-the-money (i.e. no intrinsic value) call options and pocketing premiums on a regular basis. Today (4 February 2004) Joe has written one option on September calls in Cadbury Schweppes for an exercise price of 420p (current share price 416.5p). In other words, Joe is committed to delivering (selling) 1,000 shares at any time between 4 February 2004 and near the end of September 2004 for a price of 420p at the insistence of the person that bought the call. This could be very unpleasant for Joe if the market price rises to say 500p. Then the option holder will require Joe to sell shares worth £5,000 to him/her for only £4,200. However, Joe is prepared to take this risk for two reasons. First he receives the premium of 24p per share up front – this is 5.8% of each share's value, equivalent to double the annual dividend. This £240 will cushion any feeling of future regret at his actions. Second, Joe holds 1,000 Cadbury Schweppes shares in his portfolio and so would not need to go into the market to buy the shares to then sell them to the option holder if the price did rise significantly. Joe has written a *covered call* option – so-called because he has backing in the form of the underlying shares. Joe only loses out if the share price on the day the option is exercised is greater than the strike price (£4.20) plus the premium (24p). He is prepared to risk losing some of the potential up side (above 420p + 24p = 444p) to gain the premium. He also reduces his loss on the downside: if the shares in his portfolio fall he has the premium as a cushion.

Some speculators engage in *uncovered (naked)* option writing. It is possible to lose a multiple of your current resources if you write a lot of option contracts and the price moves against you. Imagine if Joe had only £10,000 in savings and entered the options market by writing 30 Cadbury Schweppes September 2004

420 calls receiving a premium of  $24p \times 30 \times 1,000 = \text{£}7,200$ .<sup>1</sup> If the price moves to  $\text{£}5$  Joe has to buy shares for  $\text{£}5$  and then sell them to the option holders for  $\text{£}4.20$ , a loss of  $80p$  per share:  $80p \times 30 \times 1,000 = \text{£}24,000$ . Despite receiving the premiums Joe has wiped out his savings.

<sup>1</sup> This is simplified. In reality Joe would have to provide margin of cash or shares to reassure the clearing house that he could pay up if the market moved against him. So it could be that all of the premium received would be tied up in margin held by the clearing house (the role of a clearing house is explained in the next chapter).

## LIFFE share options

The *Financial Times* lists over eighty companies' shares in which options are traded (see Exhibit 19.1).

## Put options

A put option gives the holder the right, but not the obligation, to sell a specific quantity of shares on or before a specified date at a fixed exercise price.

Imagine you are pessimistic about the prospects for Cadbury Schweppes on 4 February 2004. You could purchase, for a premium of  $9.5p$  per share ( $\text{£}95$  in total), the right to sell 1,000 shares in or before late June 2004 at  $390p$  (see Exhibit 19.1). If a fall in price subsequently takes place, to, say,  $350p$ , you can insist on exercising the right to sell at  $390p$ . The writer of the put option is obliged to purchase shares at  $390p$  while being aware that the put holder is able to buy shares at  $350p$  on the stock exchange. The option holder makes a profit of  $390 - 350 - 9.5 = 30.5p$  per share, a 321 percent return (before costs).

For the put option holder, if the market price exceeds the exercise price, it will not be wise to exercise as shares can be sold for a higher price on the stock exchange. Therefore the maximum loss, equal to the premium paid, is incurred. The option writer gains the premium if the share price remains above the exercise price, but may incur a large loss if the market price falls significantly (see Figures 19.4 and 19.5).

As with calls, in most cases the option holder would take profits by selling the option on to another investor via LIFFE rather than waiting to exercise at expiry.

## Traditional options

The range of underlyings available on LIFFE and other exchanges are limited. Traditional options, on the other hand, are available on any security, but there is no choice on the strike (exercise) price: this is set as the market price on the day the option is bought (or close to it). Also all options expire within three months (traded options have up to nine months to expiry) and the option cannot be sold

**EQUITY OPTIONS**

Option	.....Calls.....			.....Puts.....			.....Calls.....			.....Puts.....					
	Apr	Jun	Sep	Apr	Jun	Sep	Option	Feb	Mar	Apr	Feb	Mar	Apr		
3i Group	600	47.5	58.0	67.0	12.5	22.0	31.0	Vodafone	130	6.75	8.75	10.25	1.25	3.00	4.00
(*631.0)	650	19.5	30.5	40.5	34.5	46.0	55.0	(*135.25)	140	1.75	3.50	4.75	6.25	7.75	8.50
Abbey Natl	550	26.0	33.5	42.5	26.5	34.5	45.0	Option		Feb	Mar	Apr	Feb	Mar	Apr
(*558.5)	600	6.0	13.5	22.0	60.5	66.0	74.5	Alice & Leics	850	24.5	40.0	53.5	6.0	33.5	54.0
Ald Domecq	420	32.5	41.0	46.0	6.0	12.0	18.5	(*867.0)	900	2.5	15.0	28.5	34.5	65.0	82.5
(*443.0)	460	10.5	18.0	25.0	24.5	29.5	37.5	Anglo Amer	1200	47.5	81.0	111.0	11.5	55.5	79.5
Amvescap	390	42.0	50.5	62.0	19.0	28.0	39.5	(*1234.0)	1250	20.0	56.0	85.5	33.5	81.0	104.5
(*414.0)	420	25.0	35.5	47.0	33.0	43.0	54.0	BAE Systems	160	5.75	11.50	16.75	3.25	12.00	16.00
BAA	500	36.0	42.5	46.5	6.0	13.0	17.0	(*162.00)	180	0.25	3.75	8.75	18.00	25.00	28.25
(*527.5)	550	8.5	14.5	20.5	28.5	38.5	42.0	BOC Group	850	38.5	67.0	81.0	5.0	25.5	48.5
BAT	750	45.0	48.0	52.5	10.5	16.5	26.5	(*882.5)	900	9.0	38.0	53.0	25.5	47.0	73.0
(*792.0)	800	10.0	18.5	25.5	37.0	42.5	52.0	Capita	240	11.0	18.5	25.0	1.0	8.5	13.5
BHP Billiton	420	41.5	48.0	57.0	11.0	17.0	25.0	(*249.5)	260	1.0	9.0	15.5	11.0	19.0	24.0
(*447.5)	460	18.0	24.5	33.0	27.5	34.0	41.5	Carlton Com xe	280	11.5	23.5	33.5	7.0	17.5	26.0
Boots Group	700	27.0	34.0	40.0	19.5	33.0	41.0	(*284.0)	300	3.5	15.0	24.5	19.0	28.5	36.5
(*702.5)	750	7.5	13.0	19.0	51.0	66.5	72.5	Gallaher	600	24.0	29.5	36.5	1.5	17.0	26.0
Br Airways	280	27.00	33.25	42.00	17.50	24.75	31.50	(*621.0)	650	1.5	7.5	14.5	30.0	51.0	56.0
(*287.50)	300	17.25	23.25	31.50	28.00	34.50	40.75	Hilton	220	10.5	16.0	22.0	1.5	10.5	16.0
Cadbury Sch	390	33.5	35.5	40.5	4.0	9.5	14.5	(*228.5)	240	1.5	7.0	13.5	12.5	22.0	27.5
(*416.5)	420	13.5	17.5	24.0	14.5	23.0	28.5	Impl Tobacco	1100	41.0	71.5	94.0	4.0	25.0	45.5
Centrica	200	15.0	16.0	19.0	4.5	6.5	8.5	(*1135.0)	1150	12.0	42.0	66.5	25.0	47.0	69.0
(*209.0)	220	5.5	6.0	9.0	15.0	17.0	19.0	Invensys	20	4.25	6.00	7.25	0.50	2.00	3.00
Corus	35	6.00	7.00	8.75	2.00	3.00	4.25	(*23.75)	25	1.25	3.25	4.75	2.50	4.25	5.50
(*38.75)	40	3.25	4.75	6.25	4.25	5.50	6.75	Kingfisher	260	20.0	25.5	31.5	0.5	7.5	12.0

Share price at the end of the trading day

Strike or exercise price for this line of options

Put option premium – in this case with a March 2004 exercise date

Premium payable per share for call options with a April 2004 exercise date

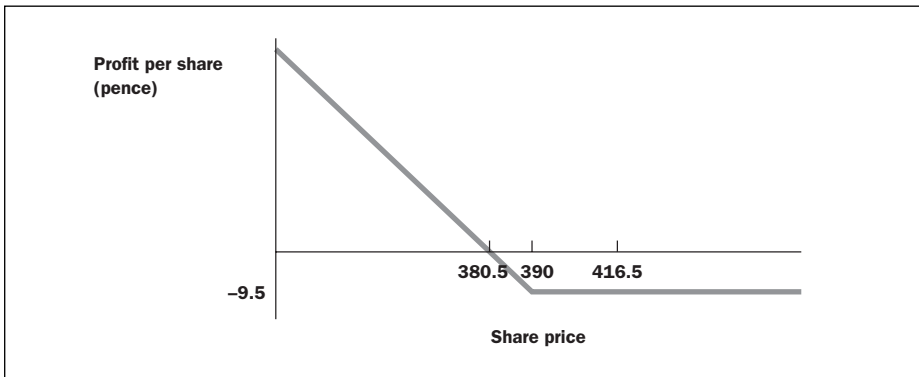
**EXHIBIT 19.1** LIFFE equity options

Source: Financial Times 5 February 2004

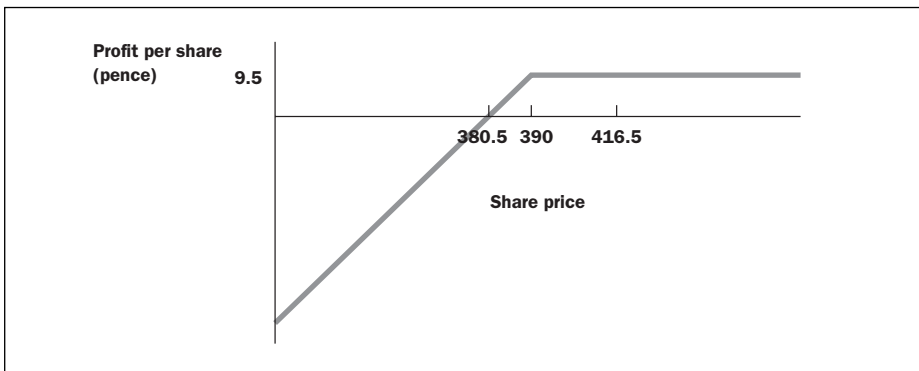


**FIGURE 19.4**

**Put option holder profit profile (Cadbury Schweppes 390 June put, purchased 4 February 2004)**

**FIGURE 19.5**

**Put option writer profit profile (Cadbury Schweppes 390 June put, sold 4 February 2004)**



on to another investor: it has to be either exercised by the original purchaser or left to lapse (it can be exercised at any time before expiry). The purchaser may close a position during the life of an option by doing the reverse (e.g. if he has bought a call option he could sell a call option at the same strike price).

### Using share options to reduce risk: hedging

Hedging with options is especially attractive because they can give protection against unfavorable movements in the underlying while permitting the possibility of benefiting from favorable movements. Suppose you hold 1,000 shares in

Cadbury Schweppes on 4 February 2004. Your shareholding is worth £4,165. There are rumors flying around the market that the company may become the target of a takeover bid. If this materializes the share price will rocket; if it does not the market will be disappointed and the price will fall dramatically. What are you to do? One way to avoid the downside risk is to sell the shares. The problem is that you may regret this action if the bid does subsequently occur and you have forgone the opportunity of a large profit. An alternative approach is to retain the shares and buy a put option. This will rise in value as the share price falls. If the share price rises you gain from your underlying share holding.

Assume a 390 September put is purchased for a premium of £145 (*see* Exhibit 19.1). If the share price falls to 330p in late September you lose on your underlying shares by £865  $((416.5p - 330p) \times 1,000)$ . However the put option will have an intrinsic value of £600  $((390p - 330p) \times 1,000)$ , thus reducing the loss and limiting the downside risk. Below 390p, for every 1p lost in a share price, 1p is gained on the put option, so the maximum loss is £410 (£265 intrinsic value + £145 option premium).

This hedging reduces the dispersion of possible outcomes. There is a floor below which losses cannot be increased, while on the upside the benefit from any rise in share price is reduced due to the premium paid.

A simpler example of risk reduction occurs when an investor is fairly sure that a share will rise in price but is not so confident as to discount the possibility of a fall. Suppose that the investor wished to buy 10,000 shares in Boots, currently priced at 702.5p (on 4 February 2004) – *see* Exhibit 19.1. This can be achieved either by a direct purchase of shares in the market or through the purchase of an option. If the share price does fall significantly, the size of the loss is greater with the share purchase – the option loss is limited to the premium paid.

Suppose that ten June 750 call options are purchased at a cost of £1,300  $(13p \times 1,000 \times 10)$ . Table 19.3 shows that the option is less risky because of the ability to abandon the right to buy at 750p.

**TABLE 19.3**  
**Losses on alternative buying strategies**

Boots share price falls to:	Loss on 10,000 shares	Loss on 10 call options options
700	£250	£1,300
650	£5,250	£1,300
600	£10,250	£1,300
550	£15,250	£1,300
500	£20,250	£1,300

## Index options

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Options on whole share indices can be purchased, for example, Standard and Poors 500 (USA), FTSE 100 (UK), CAC 40 (France), DAX (Germany) and so on.

**Large investors may hedge through options on the entire index of shares.**

Large investors usually have a varied portfolio of shares so, rather than hedging individual shareholdings with options, they may hedge through options on the entire index of shares. Also speculators can take a position on the future movement of the market as a whole.

A major difference between index options and share options is that the former are 'cash settled' – so for the FTSE 100 option, 100 different shares are not delivered on the expiry day. Rather, a cash difference representing the price change passes hands.

If you examine the table in Exhibit 19.2, you will see that the index is regarded as a price and each one-point movement on the index represents £10. So if you purchased one contract in June expiry 4425 calls (C) you would pay an option premium of 130.5 index points  $\times$  £10 = £1,305. Imagine that the following day, i.e. 5 February 2004, the FTSE 100 Index moved from its closing level on 4 February 2004 of 4398.5 to 4450 and the option price on the 4425 call moved to 210 index points (25 points of intrinsic value and 185 points of time value). To convert this into money you could sell the option at £10 per point per contract ( $210 \times$  £10 = £2,100). In 24 hours your £1,305 has gone up to £2,100, a 61 percent rise. This sort of gain is great when the market moves in your favor. If it moves against you large percentage losses will occur in just a few hours.

All the calls (indicated by C) in Exhibit 19.2 with exercise prices below 4398.5 (the columns headed 4025, 4125, 4225, 4325) are in-the-money; they have intrinsic as well as time value. Calls with exercise prices above 4398.5 have no intrinsic value and so are out-of-the-money. By contrast, all puts (indicated by a P) with an exercise price lower than 4398.5 do not have intrinsic value and are out-of-the-money.

### Hedging against a decline in the market

A fund manager controlling a £30m portfolio of shares on behalf of a group of pensioners is concerned that the market may fall over the next few months. One strategy to lower risk is to purchase put options on the share index. If the market does fall, losses on the portfolio will be offset by gains on the value of the index put option.

First the manager has to calculate the number of option contracts needed to hedge the underlying. With the index at 4398.5 on 4 February 2004 and each point of that index settled at £10, one contract has a value of  $4398.5 \times$  £10 = £43,985. To cover a £30m portfolio:

$$\frac{\pounds 30\text{m}}{\pounds 43,985} = 682 \text{ contracts}$$

### OPTIONS

■ FTSE 100 INDEX OPTION (Euronext.liffe) \$10 per full index point

04 Feb

	4025		4125		4225		4325		4425		4525		4625		4725	
	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P
Feb	<b>373</b>	3	<b>275</b>	4½	<b>179½</b>	8½	<b>93½</b>	22½	<b>32</b>	60½	<b>7</b>	135½	<b>1</b>	229½	<b>½</b>	329
Mar	<b>365</b>	15½	<b>274½</b>	24½	<b>188½</b>	38	<b>115</b>	64	<b>58½</b>	107½	<b>24</b>	172	<b>9</b>	257	<b>3</b>	350½
Apr	<b>383</b>	31½	<b>295½</b>	43½	<b>213½</b>	60½	<b>141</b>	87½	<b>84</b>	129½	<b>44</b>	189	<b>20</b>	264	<b>7½</b>	351
May	<b>406½</b>	49	<b>321</b>	63½	<b>242</b>	84½	<b>170</b>	112½	<b>110½</b>	153	<b>66</b>	208½	<b>35½</b>	278	<b>16½</b>	359
Jun	<b>415</b>	61	<b>334</b>	78½	<b>257</b>	100	<b>188½</b>	129½	<b>130½</b>	170½	<b>84</b>	222	<b>49</b>	286	<b>28</b>	363

Calls 19,428; Puts 49,555. \*Underlying index value. Premiums shown are based on settlement prices.

### EXHIBIT 19.2 FTSE 100 Index option prices

Sources: *Financial Times* 5 February 2004

The manager opts to buy 682 June 4425 puts for 170.5 points per contract.<sup>3</sup> The premium payable is:

$$170.5 \text{ points} \times \pounds 10 \times 682 = \pounds 1,162,810$$

This amounts to a 3.9 percent 'insurance premium' (1.1628m/30m) against a downturn in the market.

Consider what happens if the market does fall by a large amount, say, 15 percent, between February and June. The index falls to 3739, and the loss on the portfolio is:

$$\pounds 30\text{m} \times 0.15 = \pounds 4,500,000$$

If the portfolio was unhedged the pensioners suffer from a market fall. However in this case the put options gain in value as the index falls because they carry the right to sell at 4425. If the manager closed the option position by buying at a level of 3739, with the right to sell at 4425, a 686-point difference, a gain is made:

Gain on options (4425 – 3739) × 682 × £10	=	£4,678,520
Less option premium paid		–£1,162,810
		<u>£3,515,710</u>

A substantial proportion of the fall in portfolio value is compensated for through the use of the put derivative.

### Aunt Agathas and derivatives

Millions of ordinary small investors (Aunt Agathas in the City jargon) have their money applied to the derivatives markets even though they may remain blissfully unaware that such 'exotic' transactions are being conducted on their behalf. Take the case of equity-linked bonds. Investors nervous of investing in the stock market for fear of downward swings are promised a guarantee that they will receive at least the return of their original capital, even if the stock market falls. If it rises they will receive a return linked to the rise

(say the capital gain element – excluding dividends). The bulk of the capital invested may be placed in safe fixed-interest investments, with the stock market linked return created through the use of options and other derivatives. Following the Barings Bank fiasco there was some discussion over the wisdom of using such highly geared instruments. However the financial services industry easily defended itself by pointing out the risk-reducing possibilities of these products if properly managed.

#### EXHIBIT 19.3 Aunt Agathas and derivatives

## Corporate uses of options

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There are a number of corporate uses of options.

- *Share option schemes* Many companies now grant (or sell to) employees share options (calls) as a means of achieving commitment and greater goal congruence between agents and principals. Employees are offered the right to buy shares at a fixed price some time in the future. They then have the incentive over the intervening years to perform well and push up the share price so as to realize a large gain when the options may be exercised.
- *Warrants* A share warrant is an option issued by a company which gives the owner the right, but not the obligation, to purchase a specified number of shares at a specified price over a given period of time. Note that it is the company that writes the option rather than speculators or hedgers.
- *Convertible bonds* A convertible bond can be viewed as a bundle of two sets of rights. First, there are the usual rights associated with a bond, for example interest and principal payments, and second, there is the right, but not the obligation, to exercise a call option and purchase shares using the bond itself as the payment for those shares.
- *Rights issues* In a rights issue shareholders are granted the right, but not the obligation, to purchase additional shares in the company. This right has value and can be sold to other investors.
- *Share underwriting* Effectively when an underwriter agrees to purchase securities if investors do not purchase the whole issue, a put option has been bought with the underwriting fee, and the company has the right to insist that the underwriter buys at the price agreed.
- *Commodities* Many firms are exposed to commodity risk. Firms selling commodities, or buying for production purposes, may be interested in hedging against price fluctuations in these markets. Examples of such firms are airlines, food processors, car manufacturers, chocolate manufacturers. Some of the commodity options available are:
  - crude oil
  - aluminum
  - copper
  - coffee
  - cocoa.
- *Taking control of a company* A novel use of options occurred in 2003 when the family that founded the retail chain Monsoon sold put options to shareholders owning 19.5 percent of Monsoon's shares. The holders of the puts bought a right to sell their shares at 140p. If the share price on the

stock market remains below 140p many holders will exercise the option. The founding family controlled 72.5 percent of the company and saw the use of put options as a cheap way of raising their stake to over 90 percent (cheaper than a full takeover bid).

- *Protecting the company from foreign exchange rate losses.* This is topic covered in Chapter 21.

## Real options

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Managers often encounter decisions with call or put options embedded within them. Examples of these are given below.

### The expansion option

Firms sometimes undertake projects that apparently have negative NPVs. They do so because an option is thereby created to expand, should this be seen to be desirable. The value of the option outweighs the loss of value on the project. For example, many Western firms are setting up offices, marketing and production operations in China, which run up losses. This has not led to a pull-out because

**This option is considered to be so valuable that some firms are prepared to pay the price (premium) of many years of losses.**

of the long-term attraction to expand within the world's largest market. If they withdrew they would find it very difficult to re-enter, and would therefore sacrifice the option to expand. This option is considered to be so valuable that some firms are prepared to pay the price (premium) of many years of losses.

Another example would be where a firm has to decide whether to enter a new technological area. If it does it may make losses but at least it has opened up the choices available to the firm. To have refused to enter at all on the basis of a crude NPV calculation could close off important future avenues for expansion. The pharmaceutical giants run dozens of research programs knowing that only a handful will be money-spinners. They do this because they do not know at the outset which will be winners and which the losers – so they keep their options open.

### The option to abandon

With some major investments, once the project is begun it has to be completed. For example, if a contract is signed with a government department to build a bridge the firm is legally committed to deliver a completed bridge. Other projects have options to abandon (put options) at various stages and these options

can have considerable value. For example, if a property developer purchases a prime site near a town center there is, in the time it takes to draw up plans and gain planning permission, the alternative option of selling the land. Flexibility could also be incorporated in the construction process itself – for example, perhaps alternative materials can be used if the price of the first choice increases. Also, the buildings could be designed in such a way that they could be quickly and cheaply switched from one use to another, for example from offices to flats, or from hotel to shops. At each stage there is an option to abandon plan A and switch to plan B. Having plan B available has value. To have plan A only leaves the firm vulnerable to changing circumstances.

### Option on timing

Perhaps in the example of the property developer above it may be possible to create more options by creating conditions that do not compel the firm to undertake investment at particular points in time. If there was an option to wait a year, or two years, then the prospects for rapid rental growth for office space *vis-à-vis* hotels, flats and shops could be assessed. Thus a more informed, and in the long run more value-creating, decision can be made.

### True NPV

The NPV formula discussed in the first part of this book needs to be supplemented with the value of options.

$$\text{True NPV} = \text{Crude NPV} + \begin{array}{c} \text{NPV of} \\ \text{expansion} \\ \text{option} \end{array} + \begin{array}{c} \text{NPV} \\ \text{of the} \\ \text{option to} \\ \text{abandon} \end{array} + \begin{array}{c} \text{NPV of} \\ \text{timing} \\ \text{option} \end{array} + \begin{array}{c} \text{NPV of} \\ \text{other option} \\ \text{possibilities} \end{array}$$

The difficult part is putting a numerical value on each of these options. There are complex mathematical models, mostly focussed on some estimate of past volatility of returns, that academics discuss with great vigor, but it has to be admitted that in most cases the input numbers are little more than guesses. Generally, the mathematical presentation of real option values is less important than a ball-park figure, allowing for more informed decision-making. However, the alternative, of ignoring option values completely, is a poor way of proceeding because the option value can be a very high proportion of the NPV value.

**In most cases the input numbers are little more than guesses.**



### Illustration

Suppose your company owns an oil field that is largely played out. You estimate that the net (after costs) cash flows from the oil still remaining have a discounted present value of £100m. It would cost £105m now to revive the oil field. On a simple NPV analysis the project is not worthwhile with a negative NPV of £5m.

Taking a real options approach we see the oil reserves as having option value. This value arises because conditions may change in the future in such a way as to make the right to develop the field very valuable. For example, the price of oil could rise significantly. So, how do we derive the numbers showing the likelihood of oil prices moving to various elevated levels? Analysts generally look to the volatility of the oil price in the past. From this it is possible (with a leap of faith that the past volatility of oil prices represents future volatility) to come up with some numbers for the volatility of the developed reserve value.

Currently the call option to develop the field has no intrinsic value. However it might have time value – that is, there might be a reasonable expectation, judging from historic price movements that the oil price will move to a level that gives the oil field intrinsic value – i.e. a positive NPV.

Of course the value of the oil in the ground is subject to many uncertainties other than the oil price. For example, the difficulty of extraction has to be estimated by specialists. Thus, any model developed to assist this decision has to be both sophisticated in its breadth of input variables and sufficiently transparent so that managers realize the subjective nature of many of the figures and evaluate the numerical results accordingly.

Also consider whether the managers have to make the decision to spend £105m now? There is option value in waiting to see what happens to the oil price – keep open a variety of possible dates of implementation.

### Conclusion

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From a small base in the 1970s derivatives have grown to be of enormous importance. Almost all medium and large industrial and commercial firms use derivatives, usually to manage risk, but occasionally to speculate and arbitrage. Banks are usually at the center of derivatives trading, dealing on behalf of clients, as market makers or trading on their own account. Other financial institutions are increasingly employing these instruments to lay off risk or to speculate. They can be used across the globe, and traded night and day.

The trend suggests that derivatives will continue their relentless rise in significance. They can no longer be dismissed as peripheral to the workings of the financial and economic systems. The implications for investors, corporate institutions, financial institutions, regulators and governments are going to be

profound. These are incredibly powerful tools, and, like all powerful tools, they can be used for good or ill. Ignorance of the nature of the risks being transferred, combined with greed, has already led to some very unfortunate consequences. However, on a day-to-day basis, and away from the newspaper headlines, the ability of firms to quietly tap the markets and hedge risk encourages wealth creation and promotes general economic well-being.

The next chapter examines derivative tools in the form of futures, forwards and swaps among others.

**Derivatives can no longer be dismissed as peripheral to the workings of the financial and economic systems.**

## Websites

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<a href="http://www.bloomberg.com">www.bloomberg.com</a>	Bloomberg
<a href="http://www.reuters.com">www.reuters.com</a>	Reuters
<a href="http://www.money.cnn.com">www.money.cnn.com</a>	CNN Financial News
<a href="http://www.wsj.com">www.wsj.com</a>	Wall Street Journal
<a href="http://www.ft.com">www.ft.com</a>	Financial Times
<a href="http://www.fow.com">www.fow.com</a>	Futures and Options World
<a href="http://www.liffe.com">www.liffe.com</a>	London International Financial Futures and Options Exchange
<a href="http://www.liffeinvestor.com">www.liffeinvestor.com</a>	Information and learning tools from LIFFE to help the private investor
<a href="http://www.liffe-style.com">www.liffe-style.com</a>	Prices on LIFFE
<a href="http://www.ukcitymedia.co.uk/tradedoptions.html">www.ukcitymedia.co.uk/ tradedoptions.html</a>	UKCityMedia
<a href="http://www.cbot.com">www.cbot.com</a>	Chicago Board of Trade
<a href="http://www.cboe.com">www.cboe.com</a>	Chicago Board Options Exchange
<a href="http://www.amex.com">www.amex.com</a>	American Stock Exchange
<a href="http://www.nyse.com">www.nyse.com</a>	New York Stock Exchange
<a href="http://www.eurexchange.com">www.eurexchange.com</a>	Eurex, the European Derivative Exchange
<a href="http://www.isda.org">www.isda.org</a>	International Swaps and Derivatives Association

## Notes

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- 1 Expiry date is third Wednesday in expiry month.
- 2 For this exercise we will assume that the option is held to expiry and not traded before then. However in many cases this option will be sold on to another trader long before expiry date approaches (probably at a profit or loss).
- 3 This is not a perfect hedge as there is an element of the underlying risk without offsetting derivative cover.



## USING FUTURES, FORWARDS AND SWAPS TO MANAGE RISK

Introduction

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Futures

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Short-term interest rate futures

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Forwards

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Forward rate agreements

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A comparison of options, futures and FRAs

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Caps

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Swaps

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Derivatives users

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Over-the-counter and exchange-traded derivatives

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Conclusion

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## Introduction

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There are two main classes of derivative contracts. Firstly there are those where you have a right but not the obligation to go ahead with a transaction – options. Given that the future is uncertain and that the right to abandon may turn out to be valuable you are obliged to pay the option writer a premium. Option writers expose themselves to unfavorable outcomes because they grant you the right to go ahead with the deal if it is favorable to you; or to abandon it, if that is your most profitable course of action.

The second class of derivative, the subject of this chapter, commit you to going ahead with the agreed transaction at some point(s) in the future regardless of the change in underlying conditions – you have no right to abandon the bargain.<sup>1</sup>

## Futures

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Futures are contracts between two parties to undertake a transaction at an agreed price on a specified future date. In contrast to buying options, which give you the choice to walk away from the deal, with futures you are committed and are unable to back away. This is a very important difference. In purchasing an option the maximum you can lose is the premium paid whereas you can lose multiples of the amount you employ in taking a futures position.

**In contrast to buying options, with futures you are committed and are unable to back away.**

A simple example will demonstrate this. Imagine a farmer wishes to lock-in a price for his wheat, which will be harvested in six months. You agree to purchase the wheat from the farmer six months hence at a price of £60 per tonne. You are hoping that by the time the wheat is delivered the price has risen and you can sell at a profit. The farmer is worried that all he has from you is the promise to pay £60 per tonne in six months, and if the market price falls you will walk away from the deal. To reassure him you are asked to put money into what the farmer calls a *margin account*. He asks, and you agree, to deposit £6 for each tonne you have agreed to buy. If you fail to complete the bargain the farmer will be able to draw on the money from the margin account and then sell the wheat as it is harvested at the going rate for immediate ('spot') delivery. So as far as the farmer is concerned the price of wheat for delivery at harvest time could fall to £54 and he is still going to get £60 for each tonne: £6 from what you paid into the margin account and £54 from selling at the spot price.

But what if the price falls below £54? The farmer is exposed to risk – something he had tried to avoid by entering a futures deal. It is for this reason that the farmer asks you to top up your margin account on a daily basis so that there is always a buffer. He sets a *maintenance margin* level of £6 per tonne.

You have to maintain at least £6 per tonne in the margin account. So, if the day after buying the future, the harvest time price in the futures market falls to £57

you have only £3 per tonne left in the margin account as a buffer for the farmer. You agreed to buy at £60 but the going rate is only £57. To bring the margin account up to a £6 buffer you will be required to put in another £3 per tonne. If the price the next day falls to £50 you will be required to put up another £7 per tonne. You agreed to buy at £60, with the market price at £50 you have put a total of £6 + £3 + £7 = £16 into the margin account. By providing top ups as the price moves against you there will always be at least £6 per tonne providing security for the farmer. Even if you go bankrupt or simply renege on the deal he will receive at least £60 per tonne, either from the spot market or from a combination of a lower market price plus money from the margin account. As the price fell to £50 you have a £10 per tonne incentive to walk away from the deal except for the fact that you have put £16 into an account that the farmer can draw on should you be so stupid or unfortunate. If the price is £50 per tonne at expiry of the contract and you have put £16 in the margin account you are entitled to the spare £6 of margin.

It is in the margin account that we have the source of multiple losses in the future markets. Say your life savings amount to £10 and you are convinced there will be a drought and shortage of wheat following the next harvest. In your view the price will rise to £95 per tonne. So, to cash-in on your forecast you agree to buy a future for one tonne of wheat. You have agreed with the farmer that in six months you will pay £60 for the wheat, which you expect to then sell for £95. (The farmer is obviously less convinced that prices are destined to rise than you.)

To gain this right to buy at £60 you need only have £6 for the *initial margin*. The other £4 might be useful to meet day-to-day *margin calls* should the wheat price fall from £60 (temporarily in your view). If the price does rise to £95 you will make a £35 profit having laid out only £6 (plus some other cash temporarily). This is a very high return of 583 percent over six months. But what if the price at harvest time is £40. You have agreed to pay £60 therefore the loss of £20 wipes out your savings and you are made bankrupt. You lose three times your initial margin. That is the downside to the gearing effect of futures.

The above example demonstrates the essential features of futures market trading but in reality, participants in the market do not transact directly with each other but go through a regulated exchange. Your opposite number, called a *counterparty*, is not a farmer but an organization that acts as counterparty to all futures traders, buyers or sellers, called the *clearing house*. This reduces the risk of non-compliance with the contract significantly for the buyer or seller of a future, as it is highly unlikely that the clearing house will be unable to fulfil its obligation.

The exchange provides standardized legal agreements traded in highly liquid markets. The fact that the agreements are standardized allows a wide market appeal because buyers and sellers know what is being traded: the contracts are for a specific quality of the underlying, in specific amounts with specific delivery dates. For example, for sugar traded on Euronext.liffe (see Exhibit 20.1) one contract is for a specified grade of sugar and each contract is for a standard 50 tonnes with fixed delivery days in late August, October, December, March and May.

COMMODITY PRICES		Change
Alum HG (cash, t)	\$1645.5–46	+8.3
Alum Alloy (cash, t)	\$1510–11	+8.0
Copper Gr A (cash, t)	\$2577–77.5	+30.0
Lead (cash, t)	\$829.5–30	+25.0
Nickel (cash, t)	\$15100–150	+230
Tin 99.85% (cash, t)	\$6500–510	+82.5
Zinc SHG (cash, t)	\$1045–45.5	+1.5
Gold close (troy oz)	\$399.50–400.00	–3.3
Gold am fix (troy oz)	\$399.60	–2.2
Gold pm fix (troy oz)	\$399.25	–2.2
Gold – GOFO, 3mth	0.07	nc
Silver fix (troy oz)	\$608.00c	–9.5
Platinum (troy oz)	\$826.0	–6.0
Palladium (troy oz)	\$237.0	+7.0
Oil- Brent blend (Mar)	\$29.25–9.31	–0.8
Unleaded Gas (95R)	\$324–326	–6
Gas Oil (German Htg)	\$262.3–64.3	–0.7
Heavy Fuel Oil	\$120–122	–6
Naphtha	\$296–300	–13
Jet fuel	\$324.8–26.8	–13
Diesel (French)	\$278.3–80.3	–4.8
NBP Gas (Mar)	21.25–21.35	+0.1
Euro Gas (Zeebrugge)	21.25–21.45	+0.1
UKPX Spot Index £/Mwh	19.22	–2.3
Conti Power Index €/Mwh	30.3037	nc
globalCOAL RB Index™ †	\$43.33	nc
Maize (No 3 Yellow) ▲	66.9	nc
Wheat (US dark Nth)	100.9	nc
Rubber (KL RSS no1, c/kg)	472.5	nc
Palm Oil (Malay) ‡	505.0	nc
Soyabeans (US)	204.0	nc
Cotton A index (per lb)	74.05c	+0.0
Wooltops (Super, p/kg)	468.0	nc
Coffee fut (Jan)	\$758	–19
Coca fut (Mar)	931	–14
Sugar fut (white, Mar)	\$187.0	–4.00

Sources: LME/Amalgamated Metal Trading, lbma.org.uk/NM Rothschild, Petroleum Argus, UK power exchange, Platts, Global Coal, Reuters and Euronext.liffe. † US \$ per metric tonne, week to date ‡ CIF Rotterdam. ▲ CIF UK. t per tonne.

### EXHIBIT 20.1 Commodity prices

Source: *Financial Times* 4 February 2004

In examining the table in Exhibit 20.1, it is important to remember that it is the contracts themselves that are a form of security bought and sold in the market. Thus the March future priced at \$187 per tonne is a derivative of sugar and is not the same thing as sugar. To buy this future is to enter into an agreement with

rights. The rights are being bought and sold and not the commodity. When exercise takes place *then* sugar is bought. However, as with most derivatives, usually future positions are canceled by an offsetting transaction before exercise.

### Marking to market and margins

With the clearing house being the formal counterparty for every buyer or seller of a futures contract, an enormous potential for credit risk is imposed on the organization given the volume of futures traded and the size of the underlying they represent (Euronext.liffe has an average daily volume of around £500bn). If only a small fraction of market participants fail to deliver this could run into hundreds of millions of pounds. To protect itself the clearing house operates a margining system. The futures buyer or seller has to provide, usually in cash, an initial margin. The amount required depends on the futures market, the level of volatility of the underlying and the potential for default; however it is likely to be in the region of 0.1 percent to 15 percent of the value of the underlying. The initial margin is not a 'down-payment' for the underlying; the funds do not flow to a buyer or seller of the underlying, but stay with the clearing house. It is merely a way of guaranteeing that the buyer or seller will pay up should the price of the underlying move against them. It is refunded when the futures position is closed.

The clearing house also operates a system of daily marking to market. At the end of every trading day each counterparty's profits or losses created as a result of that day's price change are calculated. The counterparty that made a loss has his/her member's margin account debited. The following morning, the losing counterparty must inject more cash to cover the loss if the amount in the account has fallen below a threshold level, called the maintenance margin. An inability to pay a daily loss causes default and the contract is closed, thus protecting the clearing house from the possibility that the counterparty might accumulate further daily losses without providing cash to cover them. The margin account of the counterparty that makes a daily gain is credited. This may be withdrawn the next day. The daily credits and debits to members' margin accounts are known as variation margin.

### Worked example showing margins

Imagine a buyer and seller of a future on Monday with an underlying value of £50,000 are each required to provide an initial margin of 10 percent, or £5,000. The buyer will make profits if the price rises while the seller will make profits if the price falls. In Table 20.1 it is assumed that counterparties have to keep the entire initial margin permanently as a buffer. (In reality this may be relaxed by an exchange.)

At the end of Tuesday the buyer of the contract has £1,000 debited from his/her member's account. This will have to be handed over the following day or the exchange will automatically close the member's position and crystallize the



loss. If the buyer does provide the variation margin and the position is kept open until Friday the account will have an accumulated credit of £5,000. The buyer has the right to buy at £50,000 but can sell at £55,000. If the buyer and the seller closed their positions on Friday the buyer would be entitled to receive the initial margin plus the accumulated profit, £5,000 + £5,000 = £10,000, whereas the seller would receive nothing (£5,000 initial margin minus losses of £5,000).

**TABLE 20.1**  
**Example of initial margin, variation margin and marking to market**

£	Day				
	Monday	Tuesday	Wednesday	Thursday	Friday
Value of future (based on daily closing price)	50,000	49,000	44,000	50,000	55,000
<i>Buyer's position</i>					
Initial margin <sup>1</sup>	5,000				
Variation margin (+ credited) (– debited)	0	–1,000	–5,000	+6,000	+5,000
Accumulated profit or loss	0	–1,000	–6,000	0	+5,000
<i>Seller's position</i>					
Initial margin	5,000				
Variation margin (+ credited) (– debited)	0	+ 1,000	+ 5,000	–6,000	–5,000
Accumulated profit (loss)	0	+ 1,000	+ 6,000	0	–5,000

<sup>1</sup>Initial margin is the same as maintenance margin in this case

This example illustrates the effect of leverage in futures contracts. The initial margin payments are small relative to the value of the underlying. When the underlying changes by a small percentage the effect is magnified for the future, and large percentage gains and losses are made on the amount committed to the transaction:

$$\text{Underlying change (Monday–Friday)} \quad \frac{\pounds 55,000 - 50,000}{\pounds 50,000} \times 100 = 10\%$$

$$\text{Percentage return to buyer of future} \quad \frac{\pounds 5,000}{\pounds 5,000} \times 100 = 100\%$$

$$\text{Percentage return to seller of future} \quad \frac{-\pounds 5,000}{\pounds 5,000} \times 100 = -100\%$$

Clearly, playing the futures market can seriously damage your wealth. This was proved with a vengeance by Nick Leeson of Barings Bank. He bought futures in the Nikkei 225 Index – the main Japanese share index – in both the Osaka and

the Singapore derivative exchanges. He was betting that the market would rise as he committed the bank to buying the index at a particular price. When the index fell margin payments had to be made. Leeson took a double-or-quits attitude, 'I mean a lot of futures traders when the market is against them will double up' (Nick Leeson in an interview with David Frost reported in *Financial Times*, 11 September 1995). He continued to buy futures. To generate some cash, to make variation margin payments, he wrote combinations of call and put options ('straddles'). This compounded the problem when the Nikkei 225 Index continued to fall in 1994. The put options became an increasingly expensive commitment to bear – counterparties had the right to sell the index to Barings at a price much higher than the prevailing price. Over £800m was lost.

**Clearly, playing the futures market can seriously damage your wealth.**

## Settlement

Historically the futures markets developed on the basis of the *physical delivery* of the underlying. So if you had contracted to buy 40,000 lb. of lean hogs you would receive the meat as settlement. However in most futures markets today (including that for lean hogs) only a small proportion of contracts result in physical delivery. The majority are *closed out* before the expiry of the contract and all that changes hands is cash, either as a profit or a loss. Speculators certainly do not want to end up with five tonnes of coffee or 15,000 lb. of orange juice and so will *reverse their trade* before the contract expires; for example, if they originally bought 50 tonnes of white sugar they later sell 50 tonnes of white sugar for the same future delivery date.

Hedgers, say a confectionery manufacturer, may sometimes take delivery from the exchange but in most cases will have established purchasing channels for sugar, cocoa, etc. In these cases they may use the futures markets not as a way of obtaining goods but as a way of offsetting the risk of the prices of goods moving adversely. So a confectionery manufacturer may still plan to buy, say, sugar, at the spot price from its longstanding supplier in six months and simultaneously, to hedge the risk of the price rising, will buy six-month futures in sugar. The position will then be closed before expiry. If the price of the underlying has risen the manufacturer pays more to the supplier but has a compensating gain on the future. If the price falls the supplier is paid less and so the confectioner makes a gain here, but, under a perfect hedge, the future has lost an equal value.

**They may use the futures markets not as a way of obtaining goods but as a way of offsetting the risk of the prices of goods moving adversely.**

As the futures markets developed it became clear that most participants did not want the complications of physical delivery and this led to the development of futures contracts where cash settlement takes place. This permitted a wider range of futures contracts to be created. Futures contracts based on intangible

commodities such as a share index or a rate of interest are now important financial instruments. With these, even if the contract is held to the maturity date one party will hand over cash to other (via the clearing house system).

For example, the FTSE 100 futures (*see* Exhibit 20.2) are notional futures contracts. If not closed out before expiry they are settled in cash based on the average level of the FTSE 100 Index between stated times on the last trading day of the contract. Each index point is valued at £10.

The equity index futures table (Exhibit 20.2) in the *Financial Times* shows futures in indices from stock markets around the world for 4 February 2004. We will focus on the line for the FTSE 100 index future. This is very much a cut down version of the futures available to traders. As well as the March delivery future shown Euronext.liffe also offers traders the possibility of buying or selling futures that 'deliver' in December, June and September.

The table shows the first price traded at the beginning of the day (Open), the settlement price used to mark to market (usually the last traded price), the change from the previous day, highest and lowest prices during the day, the number of contracts traded that day (Est. vol.) and the total number of open contracts (these are trading contracts opened over the last few months that have not yet been closed by an equal and opposite futures transaction).

### Worked example 20.1 HEDGING WITH A SHARE INDEX FUTURE

It is 4 February 2004 and the FT 100 is at 4398.5. A fund manager wishes to hedge a £13m fund against a decline in the market. A March FTSE 100 future is available at 4376 – *see* Exhibit 20.2. The investor retains the shares in the portfolio and *sells* 296 index futures contracts. Each futures contract is worth £43,760 (4,376 points × £10). So 297 contracts are needed to cover £13m ( $£13\text{m}/(£10 \times 4,376) = 297$ ).

#### *Outcome in March*

For the sake of argument assume that the index falls by 10 percent to 3959, leaving the portfolio value at £11,700,000. The closing of the future position offsets this £1,300,000 loss by buying 297 futures at 3959 producing a profit of\*:

$$\begin{array}{rcl} \text{Able to sell at} & 4376 \times 297 \times £10 & = \quad £12,996,720 \\ \text{Able to buy at} & 3959 \times 297 \times £10 & = \quad \underline{£11,758,230} \\ & & \underline{\quad \quad \quad £ 1,238,490} \end{array}$$

These contracts are cash settled so £1,238,490 will be paid, plus the investor gets back margin, less broker's fees.

\* Assuming that the futures price is equal to the spot price of the FTSE 100. This would occur close to the expiry date of the future.

## EQUITY INDEX FUTURES

Feb 4		Open	Sett	Change	High	Low	Est. vol.	Open int.
DJIA	Mar	10446.0	10475.0	-3.0	10507.0	10418.0	8,722	36,831
DJ Euro Stoxx‡	Mar	2834.0	2821.0	-27.0	2841.0	2820.0	368,716	1226,828
S&P 500	Mar	1132.90	1127.50	-5.50	1133.60	1123.00	44,306	585,763
Mini S&P 500	Mar	1133.00	1127.50	-5.50	1133.50	1122.00	594,482	539,366
Nasdaq 100	Mar	1488.50	1468.00	-19.00	1488.50	1462.00	9,985	72,861
Mini Nasdaq	Mar	1488.00	1468.00	-19.00	1489.00	1461.50	256,983	249,320
Russell 2000	Mar	576.50	567.00	-11.15	576.50	565.25	969	22,953
CAC 40	Feb	3626.0	3614.0	-29.5	3632.5	3608.0	64,999	346,178
DAX	Mar	4050.0	4029.5	-31.0	4056.0	4018.0	110,890	286,286
AEX	Mar	351.20	349.35	-2.85	351.70	349.10	12,758	60,152
MIB 30	Mar	27595.0	27750.0	+65.0	27795.0	27565.0	12,567	14,098
IBEX 35	Feb	7940.0	7891.5	-79.0	7945.0	7878.0	9,406	52,906
SMI	Mar	5703.0	5759.0	+55.0	5768.0	5695.0	32,159	128,756
FTSE 100	Mar	4340.0	4376.0	+10.0	4386.5	4339.5	58,244	426,861
Hang Seng	Feb	13060.0	13036.0	-11.0	13161.0	12990.0	19,775	92,557
Nikkei 225†	Mar	10600.0	10420.0	-210.0	10640.0	10410.0	65,291	228,737
Topix	Mar	1043.5	1020.0	-24.5	1043.5	1018.0	28,119	260,356
KOSPI 200	Mar	109.60	109.60	-0.35	110.25	109.20	173,389	95,218

North American Latest. The contracts shown are among the 20 most traded based on estimates of average volumes in the first half of 2002. Previous day's Open interest. † Osaka contract. ‡ Eurex contract.

## EXHIBIT 20.2 Equity index futures

Source: *Financial Times* 5 February 2004

## Buying and selling futures

A trader in futures must deal through a registered broker. Euronext.liffe provide a list of designated brokers (these follow rules and codes of conduct imposed by the regulators and the exchange).

Gone are the days of open pit trading and those brightly colored jackets in the UK. Trades are now conducted over a computer system on Euronext.liffe (LIFFE CONNECT™). You can place a price limit for your trade – a maximum

**Gone are the days of open pit trading and those brightly colored jackets in the UK.**

you are willing to pay if you are buying or a minimum if you are selling. Alternatively you can make an ‘at-the-market order’, that is, to be executed immediately at the price determined by current supply and demand conditions. The buyer of a contract is said to

be in a long position – he/she agrees to receive the underlying. The seller who agrees to deliver the underlying is said to be in a short position.

If the amount in the trader’s account falls below the maintenance margin the trader will receive a demand to inject additional money. This may happen every

**The trader cannot buy/sell a future and then ignore the markets (unless he/she leaves plenty of cash with the broker to meet margin calls).**

day so the trader cannot buy/sell a future and then ignore the markets (unless he/she leaves plenty of cash with the broker to meet margin calls). Prices are set by competing market makers on LIFFE CONNECT™. Real time market prices are available on the internet, as well as historical prices (e.g. [www.liffe-style.com](http://www.liffe-style.com)).

## Short-term interest rate futures

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Trillions of pounds worth of trading takes place every year in the short-term interest rate futures markets. These are notional fixed-term deposits, usually for three-month periods starting at a specific time in the future. The buyer of one contract is buying the right to deposit a notional sum of money at a particular rate of interest for three months. So if the current time is February you could arrange a futures contract for you to ‘deposit’ and ‘receive interest’ on say £1m with the deposit starting in June and ending in September. The rate of interest you will ‘receive’ over the three summer months is agreed in February. (This is a notional receipt of interest, as these contracts are cash settled rather than actual deposits made and interest received – see below for an example.) So you now own the right to deposit £1m and receive x% interest for three months (at least in notional terms).

Short-term interest rate futures will be illustrated using the three-month sterling market. That is, deposits of pounds receiving notional interest for three months starting some point in the future. Note, however, that there are many other three-month deposits you could make. For example, you could deposit euros for three months, the interest rate on which is calculated with reference to ‘Euribor 3m’, which is the interest rate highly rated banks pay to other banks for three month deposits of the new currency for continental Europe, the euro.

Other three-month deposits are often for money held outside of the jurisdiction of the currency's country of origin (i.e. 'Euro' currencies, in the sense of being international money and *not* the new currency in the eurozone) include Swiss francs deposited in London (Euroswiss), Eurodollars and Euroyens (*see* Exhibit 20.3). (Eurocurrency is discussed in Chapter 16.)

The unit of trading for a three-month sterling time deposit is £500,000. Cash delivery by closing out the futures position is the means of settlement, so the buyer would not actually require the seller of the future to place the £500,000 on deposit for three months at the interest rate indicated by the futures price. Although the term 'delivery' no longer has significance for the underlying it does define the date and time of the expiry of the contract. This occurs in late September, December, March and June (*see* [www.liffe.com](http://www.liffe.com) for precise definitions and delivery dates).

Short-term interest contracts are quoted on an index basis rather than on the basis of the interest rate itself. The price is defined as:

$$P = 100 - i$$

where:

**P** = price index;

**i** = the future interest rate in percentage terms.

Thus, on 4 February 2004 the settlement price for a June three-month sterling future was 95.56, which implies an interest rate of  $100 - 95.56 = 4.44$  percent for the period June to September – *see* Exhibit 20.3. Similarly the September quote would imply an interest rate of  $100 - 95.36 = 4.64$  percent for the three months September to December 2004.

In both cases the implied interest rate refers to a rate applicable for a notional deposit of £500,000 for three months on expiry of the contract – the June futures contract expires in June and the September future expires in September. The 4.44 percent rate for three-month money starting from June 2004 is the *annual* rate of interest even though the deal is for a deposit of only one-quarter of a year.

The price of 95.56 is not a price in the usual sense – it does not mean £95.56. It is used to maintain the standard inverse relationship between prices and interest rates. For example, if traders in this market one week later, on 11 February 2004, adjusted supply and demand conditions because they expect generally raised inflation and raised interest rates by the middle of 2004, they would push up the interest rates for three-month deposits starting in June 2004 to, say, 5.0 percent. Then the price of the future would fall to 95.00. Thus, a rise in interest rates for a three-month deposit of money results in a fall in the price of the contract – analogous to the inverse relationship between interest rates offered on long-term bonds and the price of those bonds.

It is this inverse change in capital value when interest rates change which is of crucial importance to grasp about short-term interest rate futures. This is more important than trying to envisage deposits of £500,000 being placed some time in the future.

INTEREST RATE FUTURES								
Feb 4		Open	Sett	Change	High	Low	Est. vol.	Open int.
Euribor 3m*	Mar	97.94	97.94	+0.01	97.95	97.93	64,639	562,698
Euribor 3m*	Jun	97.91	97.90	+0.01	97.92	97.89	107,643	511,614
Euribor 3m*	Sep	97.77	97.76	+0.02	97.78	97.75	99,905	428,741
Euribor 3m*	Dec	97.55	97.55	+0.04	97.57	97.53	149,711	436,055
Euribor 3m*	Mar	97.32	97.31	+0.03	97.34	97.30	59,811	301,516
Euroswiss 3m*	Mar	99.73	99.73	-	99.74	99.72	1,790	95,989
Euroswiss 3m*	Jun	99.61	99.57	-0.02	99.61	99.56	6,593	81,441
Sterling 3m*	Mar	95.76	95.76	-	95.77	95.75	21,865	188,159
Sterling 3m*	Jun	95.57	95.56	-	95.58	95.54	26,292	201,882
Sterling 3m*	Sep	95.38	95.36	-	95.40	95.34	28,033	153,843
Sterling 3m*	Dec	95.21	95.20	-	95.24	95.19	22,615	139,045
Sterling 3m*	Mar	95.10	95.08	-	95.13	95.06	10,782	83,684
Eurodollar 3m†	Mar	98.84	98.84	-	98.85	98.84	85,990	827,925
Eurodollar 3m†	Jun	98.69	98.69	-	98.70	98.67	105,193	838,794
Eurodollar 3m†	Sep	98.42	98.41	-	98.43	98.38	123,159	794,586
Eurodollar 3m†	Dec	98.05	98.04	-	98.07	98.00	165,779	600,750
Eurodollar 3m†	Mar	97.65	97.64	-	97.67	97.59	100,338	419,479
Eurodollar 3m†	Jun	97.24	97.23	-	97.27	97.19	36,116	330,839
Eurodollar 3m†	Sep	96.88	96.87	-	96.91	96.82	35,044	260,971
Fed Fnds 30d‡	Feb	99.000	99.000	-	99.000	98.995	781	64,359
Fed Fnds 30d‡	Mar	98.995	98.990	-	98.995	98.990	1,381	48,219
Fed Fnds 30d‡	Apr	98.995	98.990	-	98.995	98.990	2,792	71,817
Euroyen 3m‡‡	Mar	99.915	99.910	-0.005	99.915	99.910	19,481	207,689
Euroyen 3m‡‡	Jun	99.920	99.920	-	99.920	99.915	7,733	183,104
Euroyen 3m‡‡	Sep	99.895	99.900	-	99.900	99.895	733	124,973

Contracts are based on volumes traded in 2001.  
Sources: \* LIFFE. † CME. ‡ CBOT. ‡‡ TIFFE

### EXHIBIT 20.3 Interest rate futures

Source: *Financial Times* 5 February 2004

## Worked example 20.2

### HEDGING THREE-MONTH DEPOSITS

An example of these derivatives in use may help with gaining an understanding of their hedging qualities. Imagine the treasurer of a large company anticipates the receipt of £100m in December 2004,  $10\frac{1}{2}$  months hence. She expects that the money will be needed for production purposes in the Spring of 2005 but for the three months following late December it can be placed on deposit. There is a risk that interest rates will fall between now (February 2004) and December 2004 from their present level of 4.80% per annum for three-month deposits starting in late December. (The Sterling 3m Dec. future in Exhibit 20.3 shows a price of 95.20, indicating an interest rate of 4.80, that is  $100 - 95.20 = 4.80$ .)

The treasurer does not want to take a passive approach and simply wait for the inflow of money and deposit it at whatever rate is then prevailing

without taking some steps to ensure a good return.

To achieve certainty in December 2004 the treasurer buys, in February, December expiry three-month sterling interest rate futures at a price of 95.20. Each future has a notional value of £500,000 and therefore she has to buy 200 to hedge the £100m inflow.

Suppose in December that three-month interest rates have fallen to 4%. Following the actual receipt of the £100m the treasurer can place it on deposit and receive a return over the next three months of  $£100m \times 0.04 \times \frac{3}{12} = £1m$ . This is significantly less than if December 2004 three-month deposit interest rates had remained at 4.80% throughout the  $10\frac{1}{2}$  month waiting period.

Return at 4.80% ( $£100m \times 0.048 \times \frac{3}{12}$ )	= £1,200,000
Return at 4.00% ( $£100m \times 0.040 \times \frac{3}{12}$ )	= <u>£1,000,000</u>
Loss	<u>£200,000</u>

However the cautiousness of the treasurer pays off because the futures have risen in value as the interest rates have fallen.

The 200 futures contracts were bought at 95.20. With interest rates at 4% for three-month deposits starting in December the futures in December have a value of  $100 - 4 = 96.00$ . The treasurer in December can close the futures position by selling the futures for 96.00. Thus, a purchase was made in February at 95.20 and a sale in December at 96, therefore the gain that is made amounts to  $96.00 - 95.20 = 0.80$ .

This is where a *tick* needs to be introduced. A tick is the minimum price movement on a future. On a three-month sterling interest rate contract a tick is a movement of 0.01% on a trading unit of £500,000.

One-hundredth of 1% of £500,000 is equal to £50, but this is not the value of one tick. A further complication is that the price of a future is based on annual interest rates whereas the contract is for three months. Therefore  $£50/4 = £12.50$  is the value of a tick movement in a three-month sterling interest rate futures contract. In this case we have a gain of 80 ticks with an overall value of  $80 \times £12.50 = £1,000$  per contract, or £200,000 for 200 contracts. The profit on the futures exactly offsets the loss of anticipated interest when the £100m is put on deposit for three months in December.

Note that the deal struck in February was not to enter into a contract to actually deposit £100m with the counterparty on the euronext.liffe market. The £100m is deposited in December with any one of hundreds of banks with no connection to the futures contract that the treasurer entered into. The actual deposit and the notional deposit (on euronext.liffe) are two separate transactions. However, the transactions are cleverly arranged so that the value movement on these two exactly offset each other. All that is received from euronext.liffe is the tick difference, based on the price change between buying and selling prices of the futures contracts – no interest is received.



### Worked example 20.3 HEDGING A LOAN

In February 2004 Holwell plc plans to borrow £5m for three months at a later date. This will begin in June 2004. Worried that short-term interest rates will rise Holwell hedges by *selling* ten three-month sterling interest rate futures contracts with June expiry. The price of each futures contract is 95.56, so Holwell has locked into an annual interest rate of 4.44% or 1.11% for three months. The cost of borrowing is therefore:

$$£5\text{m} \times 0.0111 = £55,500$$

Suppose that interest rates rise to annual rates of 6%, or 1.5% per quarter. The cost of borrowing for Holwell will be:

$$£5\text{m} \times 0.015 = £75,000$$

However, Holwell is able to *buy* ten futures contracts to close the position on the exchange. Each contract has fallen in value from 95.56 to 94.00 (100 – 6); this is 156 ticks. The profit credited to Holwell's margin account of euronext.liffe will now stand at:

Bought at 94.00, sold at 95.56:

$$156 \text{ ticks} \times £12.50 \times 10 \text{ contracts} = £19,500$$

Holwell pays interest to its lender for the three months June to September at 6% annual rate. The extra interest is £75,000 – £55,500 = £19,500. However, the derivative profit offsets the extra interest cost on the loan Holwell takes out in June.

Note that if interest rates fall Holwell will gain by being charged lower interest on the actual loan, but this will be offset by the loss of the futures. Holwell sacrifices the benefits of potential favorable movements in rates to reduce risk.

As Exhibit 20.4 shows, the price of short-term interest rate futures are followed closely as they give an indication of the market view on the level of short-term interest rates a few months hence.

## Forwards

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Imagine you are responsible for purchasing potatoes to make crisps for your firm, a snack food producer. In the free market for potatoes the price rises or falls depending on the balance between buyers and sellers. These movements can be dramatic. Obviously you would like to acquire potatoes at a price that was as low as possible, while the potato producer wishes to sell for a price that is as high as possible. However both parties may have a similar interest in reducing the uncer-

## Betting on interest rates

Graham Bowley

### The short sterling market has its own advice to offer

As the Chancellor and the Governor of the Bank of England sit down to ponder interest rate policy at their monthly monetary meeting today, a £40bn-a-day industry will be pronouncing its own judgment on where rates are going next.

The betting in the so-called 'short sterling' futures market is that policy-makers will leave rates unchanged until well into next year. Banks and companies use this market to protect themselves against adverse changes in rates, while speculators use it to gamble on how rates might move.

Short sterling futures are traded on the London International Financial Futures and Options Exchange. Their current price implies a prediction that base rates will still be at  $6\frac{3}{4}$  per cent by the end of this year, rising to 7 per cent by the end of next year. With more than £10,000bn each year backing these bets, this is a forecast that policymakers ignore at their peril.

'Short sterling takes in all the latest economic and political news to give an indication of where the money market thinks short-term interest rates will be going in the future,' said Mr Nigel Richardson, an economist at Yamaichi International, a Japanese bank.

The companies and banks buying short sterling futures are making a simple bet. The price of the short sterling contract is equal to 100 minus whatever interest rate is expected when the three month contract expires, so the price of the contract rises when interest rates fall.

If a company thought interest rates would be  $6\frac{3}{4}$  per cent by December it would expect the price of the December contract to be 93.25. If the current price of the December contract was below 93.25 – in other words the market expected interest rates to be

higher than  $6\frac{3}{4}$  per cent at the end of the year – then the company could buy the contract and expect to profit when it expired in December.

This allows a short sterling trader to protect itself against a possible interest rate movement, effectively fixing the interest rate at which it borrows or lends. A more aggressive investor can use short sterling to gamble on an interest rate change.

Imagine a company has a sum of money to invest in a bank, but fears interest rates will fall. The company could buy a short sterling contract expiring in three months. If, by then, interest rates had not fallen, the company would have lost nothing. If rates did fall the company would get a lower return on its investment, but this would have been offset by a rise in the price of the futures contract.

Another company might want to borrow money, but fear that interest rates are set to rise. It could hedge against this risk by selling short sterling futures. If rates did rise the company's borrowing costs would be higher, but it would be able to buy the contract back at a lower price and use the profit to offset the cost.

This is useful for banks providing fixed-rate mortgages. They use the short sterling market to fix the interest rates at which they borrow, which they can then pass on to customers.

Economists in the City use the forecast provided by the short sterling market as a basis for their own projections. 'It is very useful. It tells you what the market is predicting and you then take the market into account when making your own forecast,' said Mr Stuart Thomson, economist at Nikko, a Japanese bank.

But there have been times when the forecasts have been very different – and short sterling has not always been right. This year the short sterling market was expecting interest rates to be close to 9 per cent by December. Economists were expecting a more modest increase, and in the event they were proved more accurate.

Similarly, after the pound's exit from the European exchange rate mechanism in 1992, short sterling predicted that interest rates would have to

remain high. In event they were cut aggressively.

'If you just want an average of the views of everybody acting in the market, then short sterling is fine,' said Mr Ian Shepherdson, an economist at HSBC Markets. 'But if you want an opinion, you need an economist. Short sterling gives the consensus, but the consensus is not always right.'

Policymakers will no doubt draw solace from the fact that markets can be wrong sometimes too.

#### EXHIBIT 20.4 Betting on interest rates

Source: *Financial Times* 1 November 1995

tainty of price. This will assist both to plan production and budget effectively. One way in which this could be done is to reach an agreement with the producer(s) to purchase a quantity of potatoes at a price agreed today to be delivered at a specified time in the future. Bensons, the UK crisp producer, buys 80 percent of its potatoes up to 19 months forward. Once the forward agreements have been signed and sealed Bensons may later be somewhat regretful if the spot price (price for immediate delivery) subsequently falls below the price agreed months earlier. Unlike option contracts, forwards commit both parties to complete the deal. However Bensons is obviously content to live with this potential for regret in order to remove the risk associated with such an important raw material.

**Unlike option contracts, forwards commit both parties to complete the deal.**

A forward contract is an agreement between two parties to undertake an exchange at an agreed future date at a price agreed now.

There are forward markets in a wide range of commodities but the most important forward markets today are for foreign exchange, in which hundreds of billions of dollars worth of currency are traded every working day – this is considered in Chapter 21.

Forward contracts are tailor-made to meet the requirements of the parties. This gives flexibility on the amounts and delivery dates. Forwards are not traded on an exchange but are 'over-the-counter' instruments – private agreements outside the regulation of an exchange. This makes them different to futures, which are standardized contracts traded on exchanges. Such an agreement exposes the counterparties to the risk of default – the failure by the other to deliver on the agreement. The risk grows in proportion to the extent to which the spot price diverges from the forward price as the incentive to renege increases.

Forward contracts are difficult to cancel, as agreement from each counterparty is needed. Also to close the contract early may result in a penalty being charged. Despite these drawbacks forward markets continue to flourish.

## Forward rate agreements (FRAs)

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FRAs are useful devices for hedging future interest rate risk. They are agreements about the future level of interest rates. The rate of interest at some point in the future is compared with the level agreed when the FRA was established and compensation is paid by one party to the other based on the difference.

For example, a company needs to borrow £6m in six months' time for a period of a year. It arranges this with bank X at a variable rate of interest. The current rate of interest for borrowing starting in six months is 7 percent. (For the sake of argument assume that this is Libor rate for borrowing starting in six months and this company can borrow at Libor). The company is concerned that by the time the loan is drawn down interest rates will be higher than 7 percent, increasing the cost of borrowing.

The company enters into a separate agreement with another bank (Y) – an FRA. It 'purchases' an FRA at an interest rate of 7 percent. This is to take effect six months from now and relate to a 12-month loan. Bank Y will never lend any money to the company but it has committed itself to paying compensation should interest rates (Libor) rise above 7 percent.

Suppose that in six months spot one-year interest rates are 8.5 percent. The company will be obliged to pay Bank X this rate:  $£6m \times 0.085 = £510,000$ ; this is £90,000 more than if the interest rates were 7 percent.<sup>2</sup> However, the FRA with Bank Y entitles the company to claim compensation equal to the difference between the rate agreed in the FRA and the spot rate. This is  $(0.085 - 0.07) \times £6m = £90,000$ . So any increase in interest cost above 7 percent is exactly matched by a compensating payment provided by the counterparty to the FRA. However, if rates fall below 7 percent the company makes payments to Bank Y. For example, if the spot rate in six months is 5 percent the company benefits because of the lower rate charged by Bank X, but suffers an equal offsetting compensation payment to Bank Y of  $(0.07 - 0.05) \times £6m = £120,000$ . The company has generated certainty over the effective interest cost of borrowing in the future. Whichever way the interest rates move it will pay £420,000.

This example is a gross simplification. In reality FRAs are generally agreed for three-month periods. So this company could have four separate FRAs for the year. It would agree different interest rates for each three-month period. If three-month Libor turns out to be higher than the agreed interest rate, Bank Y will pay the difference to the company. If it is lower the company pays Bank Y the difference. The 'sale' of an FRA by a company protects against a fall in interest rates. For example, if £10m is expected to be available for putting into a one-year bank deposit in three months the company could lock into a rate now by selling an FRA to a bank. Suppose the agreed rate is 6.5 percent and the spot rate in three

months is 6 percent, then the depositor will receive 6 percent from the bank into which the money is placed plus  $\frac{1}{2}$  percent from the FRA counterparty bank.

The examples above are described as 6 against 18 (or  $6 \times 18$ ) and 3 against 15 (or  $3 \times 15$ ). The first is a 12-month contract starting in six months, the second is a 12-month contract starting in three months. More common FRA periods are 3 against 6 and 6 against 12. Typically sums of £5m–£100m are hedged in single deals in this market. Companies do not need to have an underlying lending or borrowing transaction – they could enter into an FRA in isolation and make or receive compensating payments only.

## A comparison of options, futures and FRAs

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We have covered a lot of ground in field of derivatives. It is time to summarize the main advantages and disadvantages of the derivatives covered so far – *see* Table 20.2.

## Caps

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An interest rate cap is a contract that gives the purchaser the right to effectively set a maximum level for interest rates payable. Compensation is paid to the purchaser of a cap if interest rates rise above an agreed level. This is a hedging technique used to cover interest rate risk on longer-term borrowing (usually two to five years). Under these arrangements a company borrowing money can benefit from interest rate falls but can place a limit to the amount paid in interest should interest rates rise.

### Worked example 20.4 INTEREST RATE CAP

For example, Oakham plc may wish to borrow £20m for five years. It arranges this with bank A at a variable rate based on Libor plus 1.5%. The interest rate is reset every quarter based on three-month Libor. Currently this stands at an annual rate of 7%. The firm is concerned that over a five-year period the interest rate could rise to a dangerous extent.

Oakham buys an interest rate cap set at Libor of 8.5%. For the sake of argument we will assume that this costs 2.3% of the principal amount, or  $\text{£}20\text{m} \times 0.023 = \text{£}460,000$  payable immediately to the cap seller. If over the subsequent five years Libor rises above 8.5% in any three-month period Oakham will receive sufficient compensation from the cap seller to exactly offset any extra interest above 8.5%. So if for the whole of the third year Libor rose to 9.5% Oakham would pay interest at 9.5% plus 1.5% to bank A but would also receive 1% compensation from the cap seller (a quarter every three months), thus capping the interest payable. If interest rates fall Oakham benefits by paying bank A less.

The premium (£460,000) payable up front covers the buyer for the entire five years with no further payment due.

**TABLE 20.2****A comparison of options, futures, forwards and forward rate agreements**

Options	Futures	Forwards and FRAs
<i>Advantages</i>		
Downside risk is limited but the buyer is able to participate in favorable movements in the underlying.	Can create certainty: Specific rates are locked in.	Can create certainty: Specific rates are locked in.
Available on or off exchanges. Exchange regulation and clearing house reduce counterparty default risk for those options traded on exchanges.	Exchange trading only. Exchange regulation and clearing house reduce counterparty default risk.	Tailor-made, off-exchange. Not standardized as to size, duration and terms. Good for companies with non-standard risk exposures.
	No premium is payable. (However margin payments are required.)	No margins or premiums payable. (Occasionally a good faith performance margin is required by one or more parties in a forward. Also credit limits may be imposed.)
For many options there are highly liquid markets resulting in keen option premium pricing and ability to reverse a position quickly at low cost. For others trading is thin and so premiums payable may become distorted and offsetting transactions costly and difficult.	Very liquid markets. Able to reverse transactions quickly and cheaply.	
<i>Disadvantages</i>		
Premium payable reduces returns.	No right to let the contract lapse. Benefits from favorable movements in underlying are forgone.	No right to let the contract lapse. Benefits from favorable movements in underlying are forgone.
	In a hedge position if the underlying transaction does not materialize, resulting in a switch from a covered to an uncovered position, the potential loss is unlimited.	In a hedge position if the underlying transaction does not materialize, resulting in a switch from a covered to an uncovered position, the potential loss is unlimited.
Margin required when writing options.	Many exchange restrictions – on size of contract, duration (e.g. only certain months of the year), trading times (e.g. when euronext.liffe is open). Margin calls require daily work for 'back office'.	Greater risk of counterparty default – not exchange traded therefore counterparty is not the clearing house. More difficult to liquidate position by creating offsetting transaction that cancels position.

The size of the cap premium depends on the difference between current interest rates and the level at which the cap becomes effective; the length of time covered; and the expected volatility of interest rates. The cap seller does not need to assess the creditworthiness of the purchaser because it receives payment of the premium in advance. Thus a cap is particularly suitable for highly geared firms, such as leveraged buyouts.

## Floors and collars

Buyers of interest rate caps are sometimes keen to reduce the large cash payment at the outset. They can do this by simultaneously selling a floor, which results in a counterparty paying a premium. With a floor, if the interest rate falls below an agreed level, the seller (the floor writer) makes compensatory payments to the floor buyer. These payments are determined by the difference between the prevailing rates and the floor rate.

Returning to Oakham, the treasurer could buy a cap set at 8.5 percent Libor for a premium of £460,000 and sell a floor at 6 percent Libor receiving, say, £200,000. In any three-month period over the five-year life of the loan, if Libor rose above 8.5 percent the cap seller would pay compensation to Oakham; if Libor fell below 6 percent Oakham would save on the amount paid to bank A but will have to make payments to the floor buyer, thus restricting the benefits from falls in Libor. Oakham, for a net premium of £260,000, has ensured that its effective interest payments will not diverge from the range 6 percent + 1.5 percent = 7.5 percent at the lower end, to 8.5 percent + 1.5 percent = 10 percent at the upper end.

**Selling a floor at a low strike rate and buying a cap at a higher strike rate is called a collar.**

The combination of selling a floor at a low strike rate and buying a cap at a higher strike rate is called a collar.

## Swaps

A swap is an exchange of cash payment obligations. An interest-rate swap is where one company arranges with a counterparty to exchange interest-rate payments. For example, the first company may be paying fixed-rate interest but

**A swap is an exchange of cash payment obligations.**

prefers to pay floating rates. The second company may be paying floating rates of interest, which go up and down with Libor, but would benefit from a switch to a fixed obligation. Imagine that firm S has a £200m ten-year loan paying a fixed rate of interest of 8 percent, and firm T has a £200m ten-year loan on which interest is reset every six months with reference to Libor, at Libor plus 2 percent. Under a swap arrangement S would agree to pay T's floating-rate interest on each due date over the next ten years, and T would be obligated to pay S's 8 percent interest.

One motive for entering into a swap arrangement is to reduce or eliminate exposure to rises in interest rates. Over the short run, futures, options and FRAs could be used to hedge interest-rate exposure. However for longer-term loans (more than two years) swaps are usually more suitable because they can run the entire lifetime of the loan. So if a treasurer of a company with a large floating-rate loan forecasts that interest rates will rise over the next four years, he/she could arrange to swap interest payments with a fixed-rate interest payer for those four years.

Another reason for using swaps is to take advantage of market imperfections. Sometimes the interest-rate risk premium charged in the fixed-rate borrowing market differs from that in the floating-rate market for a particular borrower.

### Worked example 20.5 SWAPS

Take the two companies, Cat plc and Dog plc, both of which want to borrow £150m for eight years. Cat would like to borrow on a fixed-rate basis because this would better match its asset position. Dog prefers to borrow at floating rates because of optimism about future interest-rate falls. The treasurers of each firm have obtained quotes from banks operating in the markets for both fixed- and floating-rate eight-year debt. Cat could obtain fixed-rate borrowing at 10% and floating rate at Libor +2%. Dog is able to borrow at 8% fixed and Libor +1% floating:

	<i>Fixed</i>	<i>Floating</i>
Cat can borrow at	10%	Libor +2%
Dog can borrow at	8%	Libor +1%

In the absence of a swap market Cat would probably borrow at 10% and Dog would pay Libor +1%. However with a swap arrangement both firms can achieve lower interest rates.

Notice that because of Dog's higher credit rating it can borrow at a lower rate than Cat in both the fixed and the floating-rate market – it has an absolute advantage in both. However the risk premium charged in the two markets is not consistent. Cat has to pay an extra 1% in the floating-rate market, but an extra 2% in the fixed-rate market. Cat has an absolute disadvantage for both, but has a comparative advantage in the floating-rate market.

To achieve lower interest rates each firm should borrow in the market where it has comparative advantage. So Cat borrows floating-rate funds, paying Libor +2%, and Dog borrows fixed-rate debt, paying 8%.

Then they agree to swap interest payments at rates which lead to benefits for both firms in terms of (a) achieving the most appropriate interest

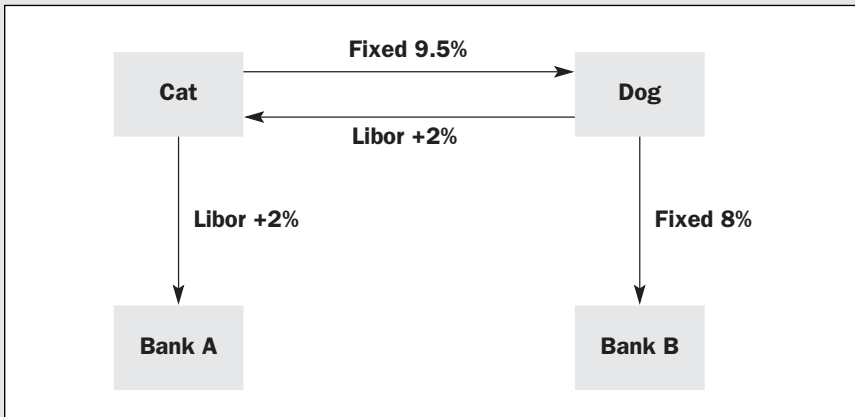


pattern (fixed or floating), and (b) the interest rate that is payable is lower than if Cat had borrowed at fixed and Dog had borrowed at floating rates. *One* way of achieving this is to arrange the swap on the following basis:

- Cat pays to Dog fixed interest of 9.5%;
- Dog pays to Cat Libor +2%.

This is illustrated in Figure 20.1.

**FIGURE 20.1**  
An interest rate swap



Now let us examine the position for each firm.

Cat pays Libor +2% to a bank but also receives Libor +2% from Dog and so these two cancel out. Cat also pays 9.5% fixed to Dog. This is 50 basis points (0.5%) lower than if Cat had borrowed at fixed rate directly from the bank. On £150m this is worth £750,000 per year.

<u>Cat:</u>	
Pays	Libor +2%
Receives	Libor +2%
Pays	<u>Fixed 9.5%</u>
Net payment	Fixed 9.5%

Dog takes on the obligation of paying a bank fixed interest at 8% while receiving 9.5% fixed from Cat on the regular payment days. The net effect is 1.5% receivable less the Libor +2% payment to Cat – a floating-rate liability of Libor +0.5%.

<u>Dog:</u>	
Pays	Fixed 8%
Receives	Fixed 9.5%
Pays	<u>Libor +2%</u>
Net payment	Libor +0.5%

Again there is a saving of 50 basis points or £750,000 per year.<sup>3</sup> The net annual £1.5m saving is before transaction costs.

Prior to the widespread development of a highly liquid swap market each counterparty incurred considerable expense in making the contracts watertight. Even then, the risk of one of the counterparties failing to fulfil its obligations was a potential problem. Today intermediaries (for example banks) take counterparty positions in swaps and this reduces risk and avoids the necessity for one corporation to search for another with a corresponding swap preference. The intermediary generally finds an opposite counterparty for the swap at a later date. Furthermore, standardized contracts reduce the time and effort to arrange a swap and have permitted the development of a thriving secondary market, and this has assisted liquidity.

There are many variations on the swaps theme. For example, a 'swaption' is an option to have a swap at a later date. In a currency swap the two parties exchange interest obligations (or receipts) and the principal amount for an agreed period, between two different currencies. On reaching the maturity date of the swap the principal amounts will be re-exchanged at a pre-agreed exchange rate. An example of such an arrangement is shown in Exhibit 20.5.

## Derivatives users

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There are three types of user of the derivatives markets: hedgers, speculators and arbitrageurs.

### Hedgers

To hedge is to enter into a transaction(s) that protects a business or assets against changes in some underlying. The instruments bought as a hedge tend to have the opposite-value movements to the underlying. Financial and commodity markets are used to transfer risk from an individual or corporation to another more willing and/or able to bear that risk.

**To hedge is to enter into a transaction(s) that protects a business or assets against changes in some underlying.**

## TVA, EIB find winning formula

Richard Lapper

The back-to-back swap deal priced yesterday for the Tennessee Valley Authority and the European Investment Bank will give both cheaper funding than they could obtain through conventional bond issuance.

TVA, the US government-owned power utility, is issuing a 10-year DM1.5bn eurobond with a Frankfurt listing, while EIB is raising \$1bn with a 10-year issue in the US market. The issuers will swap the proceeds.

Speaking in London yesterday, the treasurers of both organisations said the arrangement – now relatively unusual in the swaps market – had allowed them to reduce borrowing costs, although they did not specify by what amount.

Two elements of the deal were important in this respect. First, the EIB has a much stronger comparative advantage over TVA in funding in dollars than it does in D-Marks. Lehman

Brothers, co-bookrunner on both deals, said the EIB priced its 10-year dollar paper at 17 basis points over Treasuries, about 6 to 7 points lower than TVA could have done.

In the German market EIB enjoys a smaller advantage; it could raise funds at about 4 basis points less than the 17 points over bonds achieved by TVA.

Second, by swapping the proceeds on a back-to-back basis rather than through counter-parties, bid/offer spreads were eliminated and transaction costs reduced.

Resulting savings were pooled, providing benefits for both borrowers.

Both also diversified their funding sources. Lehman said some 65 per cent of the TVA bonds were placed in Europe, 20 per cent in Asia, and 15 per cent in the US. About half the EIB issue was placed in the US, 35 per cent in Europe, and 15 per cent in Asia.

### EXHIBIT 20.5 TVA, EIB find winning formula

Source: *Financial Times* 12 September 1996

Consider a firm that discovers a rich deposit of platinum in Kenya. The management is afraid to develop the site because they are uncertain about the revenues that will actually be realized. Some of the sources of uncertainty are that: (a) the price of platinum could fall; (b) the floating-rate loan taken out to develop the site could become expensive if interest rates rise; and (c) the value of the currencies could move adversely. The senior managers have more or less decided that they will apply the firm's funds to a less risky venture. A young executive steps forward and suggests that this would be a pity, saying: 'The company is passing up a great opportunity, and Kenya and the world economy will be poorer as a result. Besides, the company does not have to bear all of these risks given the sophistication of modern financial markets. The risks can be hedged, to limit the downside. For example, the platinum could be sold on the futures market, which will provide a firm price. The interest-rate liability can be capped or swapped into a fixed-rate loan. Other possibilities include using the FRA and the interest futures markets. The currency risk can be controlled by using currency forwards or options.' The

Board decides to press ahead with development of the mine and thus show that derivatives can be used to promote economic well-being by transferring risk.

## Speculators

Speculators take a position in financial instruments and other assets with a view to obtaining a profit on changes in value. Speculators accept high risk in anticipation of high reward. The gearing effect of derivatives makes speculations in these instruments particularly profitable, or particularly ruinous. Speculators are also attracted to derivatives markets because they are often more liquid than the underlying markets. In addition the speculator is able to sell before buying (to 'short' the market) to profit from a fall. More complex trading strategies are also possible.

**Speculators take a position in financial instruments and other assets with a view to obtaining a profit on changes in value.**

The term speculator in popular parlance is often used in a somewhat critical fashion. This is generally unwarranted. Speculators are needed by financial markets to help create trading liquidity. Prices are more, not less, likely to be stable as a result of speculative activity. Usually speculators have dissimilar views regarding future market movements and this provides two-way liquidity that allows other market participants, such as hedgers, to carry out a transaction quickly without moving the price. Imagine if only hedgers with an underlying were permitted to buy or sell derivatives. Very few trades would take place each day. If a firm wished to make a large hedge this would be noticed in the market and the price of the derivative would be greatly affected – moving against the trader. Speculators also provide a kind of insurance for hedgers – they accept risk in return for a premium.

## Arbitrageurs

The act of arbitrage is to exploit price differences on the same instrument or similar assets. The arbitrageur buys at the lower price and immediately resells at the higher price. So, for example, Nick Leeson claimed that he was arbitraging Nikkei 225 Index futures. The same future is traded in both Osaka and Singapore. Theoretically the price should be identical on both markets, but in reality this is not always the case, and it is possible simultaneously to buy the future in one market and sell the future in the other and thereby make a risk-free profit. An arbitrageur waits for these opportunities to exploit market inefficiency. The problem for Barings Bank was that Nick Leeson obtained funds to put down as margin payments on arbitrage trades but then bought futures in both markets – surreptitiously switching from an arbitrage activity to a highly risky, speculative activity. True arbitrageurs help to ensure pricing efficiency – their acts of buying or selling tend to reduce pricing anomalies.

**The act of arbitrage is to exploit price differences on the same instrument or similar assets.**

## Over-the-counter (OTC) and exchange-traded derivatives

An OTC derivative is a tailor-made, individual arrangement between counterparties, usually a company and its bank. Standardized contracts (exchange-traded derivatives) are available on dozens of derivatives around the world, for example the Chicago Board of Trade (CBOT), Chicago Board Options Exchange (CBOE), the Chicago Mercantile Exchange (CME), euronext.liffe, the MATIF in France and the Eurex in Germany and Switzerland. Roughly one-half of outstanding derivatives contracts are traded on exchanges.

**An OTC derivative is a tailor-made, individual arrangement between counterparties, usually a company and its bank.**

Many derivatives markets are predominantly, if not exclusively, OTC: interest-rate FRAs, swaps, caps, collars, floors, currency forwards and currency swaps. Figure 20.2 compares OTC and exchange-traded derivatives.

**FIGURE 20.2**  
OTC and exchange-traded derivatives

<p><b>OTC derivative</b></p> <p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>■ Contracts can be tailor-made, which allows perfect hedging and permits hedges of more unusual underlyings.</li> </ul> <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>■ There is a risk (credit risk) that the counterparty will fail to honor the transaction.</li> <li>■ Low level of market regulation with resultant loss of transparency and price dissemination.</li> <li>■ Often difficult to reverse a hedge once the agreement has been made.</li> <li>■ Higher transaction costs.</li> </ul> <p><b>Exchange-traded derivative</b></p> <p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>■ Credit risk is reduced because the clearing house is counterparty.</li> <li>■ High regulation encourages transparency and openness on the price of recent trades.</li> <li>■ Liquidity is usually much higher than for OTC – large orders can be cleared quickly due to high daily volume of trade.</li> <li>■ Positions can be reversed by closing quickly – an equal and opposite transaction is completed in minutes.</li> </ul> <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>■ Standardization may be restrictive, e.g. standardized terms for quality of underlying, quantity, delivery dates.</li> <li>■ The limited trading hours and margin requirements may be inconvenient.</li> </ul>
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## Conclusion

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As derivatives become increasingly important we need to be aware of the potential for harm that can arise from their misuse. However, the danger must not lead us to reject their use entirely. For some firms in some circumstance they can help create value. In others they can be, as Warren Buffett has called them, financial weapons of mass destruction. Given the wide-ranging nature of this book we can only touch on the main characteristics of derivatives here. But hopefully, even this limited discussion has given you some insight into their power for both wealth creation and wealth destruction. The next chapter builds on knowledge of the main types of derivatives to show how they can be used to reduce the risk of companies that operate across international borders.

## Websites

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<a href="http://www.bloomberg.com">www.bloomberg.com</a>	Bloomberg
<a href="http://www.reuters.com">www.reuters.com</a>	Reuters
<a href="http://www.money.cnn.com">www.money.cnn.com</a>	CNN Financial News
<a href="http://www.wsj.com">www.wsj.com</a>	Wall Street Journal
<a href="http://www.ft.com">www.ft.com</a>	Financial Times
<a href="http://www.fow.com">www.fow.com</a>	Futures and Options World
<a href="http://www.liffe.com">www.liffe.com</a>	London International Financial Futures and Options Exchange
<a href="http://www.liffeinvestor.com">www.liffeinvestor.com</a>	Information and learning tools from LIFFE to help the private investor
<a href="http://www.liffe-style.com">www.liffe-style.com</a>	Prices on LIFFE
<a href="http://www.cbot.com">www.cbot.com</a>	Chicago Board of Trade
<a href="http://www.cboe.com">www.cboe.com</a>	Chicago Board Options Exchange
<a href="http://www.amex.com">www.amex.com</a>	American Stock Exchange
<a href="http://www.nyse.com">www.nyse.com</a>	New York Stock Exchange
<a href="http://www.eurexexchange.com">www.eurexexchange.com</a>	Eurex, the European Derivative Exchange
<a href="http://www.isda.org">www.isda.org</a>	International Swaps and Derivatives Association

## Notes

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- 1 Caps, floors and collars are usually constructed from options on interest rates and so, in truth, belong in the option category. However, they are included in this chapter because they are another tool for managing interest rate risk, a major theme of this chapter.
- 2 All figures are slightly simplified because we are ignoring the fact that the compensation is received in six months whereas interest to Bank X is payable in 18 months.
- 3 Under a swap arrangement the principal amount (in this case £150m) is never swapped and Cat retains the obligation to pay the principal to bank A. Neither of the banks is involved in the swap and may not be aware that it has taken place. The swap focusses entirely on the three-monthly or six-monthly interest payments.



## MANAGING EXCHANGE-RATE RISK

**Introduction**

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**The impact of currency rate changes on the firm**

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**Volatility in foreign exchange**

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**The currency markets**

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**Exchange rates**

---

**Covering in the forward market**

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**Types of foreign-exchange risk**

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**Transaction risk strategies**

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**Managing translation risk**

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**Managing economic risk**

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**Conclusion**

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## Introduction

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This chapter discusses how changes in exchange rates can lead to an increase in uncertainty about income from operations in foreign countries or from trading with foreign firms. Shifts in foreign exchange rates have the potential to undermine the competitive position of the firm and destroy profits. This chapter describes some of the techniques used to reduce the risk associated with business dealings outside the home base.

### Case study 21.1

#### What a difference a few percentage point moves on the exchange rate make

Until autumn 1992 sterling was a member of the European exchange rate mechanism (ERM), which meant the extent it could move in value *vis-à-vis* the other currencies in the ERM was severely limited. Then came 'Black Wednesday' when in order to prop up the value of sterling the UK government increased bank base rates to 15 percent and instructed the Bank of England to buy billions of pounds to offset the selling pressure in the markets. It was all to no avail. The pound fell out of ERM, the government gave up the fight, and by the end of the year £1 could only buy you about DM2.35 compared with DM2.90 in the summer (a 19 percent decline).

George Soros was one of the speculators who recognized economic gravity when he saw it, and bet the equivalent of \$10bn against sterling by buying other currencies. After the fall the money held in other currencies could be converted back to make \$1bn in just a few days. He was dubbed the man who 'broke the Bank of England'. While this was not exactly true, he and others did cause severe embarrassment.

When sterling was highly valued against other currencies exporters found life very difficult because, to the foreign buyer, British goods appeared expensive – every DM, franc or guilder bought few pounds. However in the four years following 'Black Wednesday' UK exporters had a terrific boost and helped pull the economy out of recession as overseas customers bought more goods. Other European companies, on the other hand, complained bitterly. The French government was prompted by its hard-pressed importers to ask for compensation from the European Commission for the 'competitive devaluations by their neighbours'. Then things turned around. Between 1996 and 2001 the pound rose against most currencies. For example, whereas you could buy only DM2.2 at the beginning of 1996 by 2001 you could buy DM3.09 for every pound. Looked at from the German importers' viewpoint UK goods relative to domestic goods rose in price by something of the order of 30–40 percent.

UK firms lined up to speak of the enormous impact the high pound was having on profits. British Steel (Corus) cut thousands of jobs in response to sterling's rise and started losing money at an alarming rate. It also passed on the pain by telling 700 of its UK suppliers to cut prices.

James Dyson, the vacuum cleaner entrepreneur, announced in 2000 that he was planning to build a factory in East Asia rather than Britain because of the strength of the pound. In the previous year Dyson had made a loss on its £60m of exports. The Japanese car makers, Toyota, Honda and Nissan, which had established plants in Britain, complained bitterly about the high level of the pound. Their factories were set up to export cars. They were hurt by

having to reduce prices and also by their commitment to buy 70 percent of components from UK suppliers (continental European suppliers benefited from a 30–40 percent price advantage because of the high pound).

Then things turned around again. The euro shot up against the pound over the period 2002 to 2004. European companies had a very hard time trying to export, particularly into the US market because the dollar had declined against the euro by around 30 percent making European goods 30 percent more expensive in the eyes of US consumers. Worse, US exporters could compete against their European rivals more effectively when selling to countries in Asia and elsewhere because of the rise in the euro. EADS, the company that holds 80 percent of Airbus, in 2004 announced that the weakness of the dollar could wipe out €3 billion off profit. All commercial jet revenues are booked in dollars, while 50 percent of its cost base is in euros. As a way of coping it is considering sourcing more inputs from dollar zone countries and the relocation of manufacturing for new products; these moves could have profound effects on employment in continental Europe and the UK (e.g. British Aerospace supplies wings to Airbus).

The message from the ups and downs of sterling and other currencies in the last dozen years is that foreign exchange shifts and the management of the associated risk are not issues to be separated and put into a box marked ‘for the attention of the finance specialists only’. The profound implications for jobs, competitiveness, national economic growth and firms’ survival mean that all managers need to be aware of the consequences of foreign exchange rate movements and of how to prepare the firm to cope with them.

## The impact of currency rate changes on the firm

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Shifts in the value of foreign exchange, from now on to be referred to as simply ‘forex’ (FOReign EXchange),<sup>1</sup> can impact on various aspects of a firm’s activities:

- *Income to be received from abroad* For example, if a UK firm has exported goods to Canada on six months’ credit terms, payable in Canadian dollars (C\$), it is uncertain as to the number of pounds it will actually receive because the dollar could move against the pound in the intervening period.
- *The amount actually paid for imports at some future date* For example, a Japanese firm importing wood from the USA may have a liability to pay dollars a few months later. The quantity of yen (¥) it will have to use to exchange for the dollars at that point in the future is uncertain at the time the deal is struck.
- *The valuation of foreign assets and liabilities* In today’s globalized marketplace many firms own assets abroad and incur liabilities in foreign currencies. The value of these in home-currency terms can change simply because of forex movements.

- *The long-term viability of foreign operations* The long-term future returns of subsidiaries located in some countries can be enhanced by a favorable forex change. On the other hand firms can be destroyed if they are operating in the wrong currency at the wrong time.
- *The acceptability, or otherwise, of an overseas investment project* When evaluating the value-creating potential of major new investments a firm must be aware that the likely future currency changes can have a significant effect on estimated NPV.

In summary, fluctuating exchange rates create risk, and badly managed risk can lead to a loss of shareholder wealth.

## Volatility in foreign exchange

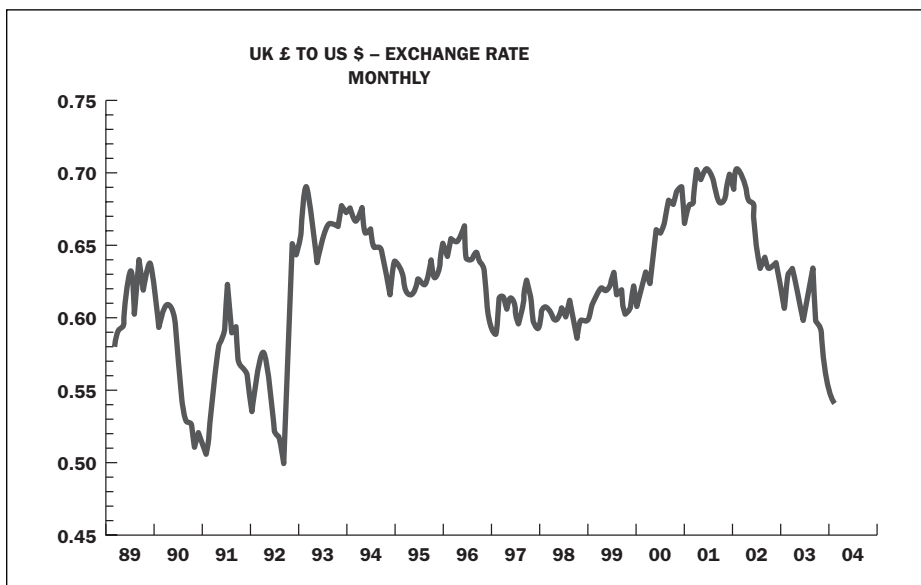
Figures 21.1 and 21.2 show the extent to which forex rates can move even over a period as short as a few weeks – 5 or 10 percent point shifts are fairly common.

In the mid-1970s a regime of (generally) floating exchange rates replaced the fixed exchange-rate system that had been in place since the 1940s. Today most currencies fluctuate against each other, at least to some extent.

If a UK firm holds dollars or assets denominated in dollars and the value of the dollar rises against the pound a forex profit is made. Conversely, should the pound rise relative to the dollar, a forex loss will be incurred. These potential

**FIGURE 21.1**

**Exchange-rate movements, UK£ to US\$, March 1989–March 2004 (monthly)**



Source: Thomson Financial Datastream

**FIGURE 21.2****Exchange-rate movements, Euro to UK£, March 1999–March 2004 (monthly)**

Source: Thomson Financial Datastream

gains or losses can be very large. For example, between March 1992 and February 1993 the dollar appreciated by 17.8 percent against the pound so you could have made a large gain by holding dollars even before the money was put to use, say, earning interest. In other periods fluctuating forex rates may wipe out profits from a project, an export deal or a portfolio investment (for example, a pension fund buying foreign shares).

## The currency markets

The function of the forex markets is to facilitate the exchange of one currency into another. This market has grown dramatically. In 1973 the equivalent of US\$10bn was traded around the globe on average each day. By 1986 this had grown to US\$300bn, and just three years later, by 1989, this had more than doubled to US\$590bn. In 1998 the daily turnover was over US\$1,490bn. In 2001 it was estimated at \$1,210bn.<sup>2</sup> London is the biggest currency trading center in the world, with US\$504bn traded daily in 2001. The US traded US\$254bn. Japan traded US\$147bn and Singapore comes in fourth place trading US\$101bn per day.

**London is the biggest currency trading center in the world.**

To put the figures in perspective consider the total output of all the people in the UK in one day (GDP): this amounts to around US\$4bn – less than one percent of the value of the currency that changes hands in London in one day. In the USA the forex turnover is nine times daily production.

In 2001 the euro entered on one side of 38 percent of all foreign exchange transactions, whereas the dollar was on one side in 90 percent of cases. The yen was on one side of 23 percent of trades and sterling was involved in only 13 percent of trades.

## Who is trading?

The buyers and sellers of foreign currencies are:

- exporters/importers
- tourists
- fund managers (pensions, insurance companies, etc.)
- governments (for example, to pay for activities abroad)
- central banks (smoothing out fluctuations)
- speculators
- banks.

The first five groups account for only a small fraction of the transactions. The big players are the large commercial banks. In addition to dealing on behalf of customers, or acting as market makers, they carry out ‘proprietary’ transactions of their own in an attempt to make a profit by taking a position in the market – that is, speculating on future movements. Companies and individuals usually obtain their foreign currencies from the banks.

**The big players are the large commercial banks.**

Foreign exchange interbank brokers often act as intermediaries between large buyers and sellers. They allow banks to trade anonymously, thus avoiding having the price move simply because of the revelation of the name of a bank in a transaction.

Most deals are still made over the telephone and later confirmed in writing. However the new electronic trading systems in which computers match deals automatically have taken a rapidly increasing share of deals.

## Twenty-four hour trading

Dealing takes place on a 24-hour basis, with trading moving from one major financial center to another. Most trading occurs when both the European and New York markets are open – this is when it is afternoon in Frankfurt, Zurich and London and morning on the east coast of the Americas. Later trade passes to San Francisco and Los Angeles, followed by Wellington, Sydney, Tokyo, Hong Kong, Singapore and Bahrain.

Most banks are in the process of concentrating their dealers in three or four regional hubs. These typically include London as well as New York and two sites in Asia, where Tokyo, Hong Kong and Singapore are keen to establish their dominance.

The vast sums of money traded every working day across the world means that banks are exposed to the risk that they may irrevocably pay over currency to a counterparty before they receive another currency in return because settlement systems are operating in different time zones. A bank could fail after receiving one leg of its foreign exchange trades but before paying the other leg – this is called Herstatt risk after a German bank that failed in 1974 leaving the dollars that it owed on its foreign exchange deals unpaid. Its failure caused panic and gridlock in the forex market, which took weeks to unravel. A new organization, the CLS Bank, will allow both legs of the trade to be paid simultaneously, eliminating the risk that one bank might fail in midstream. Under CLS, payments will be made by banks to an orderly schedule in a five-hour slot the day after the deal. A second major advantage of this system is that the net value of the trades are settled rather than the gross amounts of trades. So if a bank sold \$1bn, but also bought \$900m, the settlement is for only \$100m.

**Under CLS, payments will be made by banks to an orderly schedule in a five-hour slot the day after the deal.**

## Exchange rates

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We now look more closely at exchange rates, starting with some terms used in forex markets. First, we provide a definition of an exchange rate:

An exchange rate is the price of one currency expressed in terms of another.

Therefore if the exchange rate between the US dollar and the pound is  $\text{US\$}1.89 = \text{£}1.00$  this means that  $\text{£}1.00$  will cost  $\text{US\$}1.89$ . Taking the reciprocal,  $\text{US\$}1.00$  will cost 52.91 pence. The standardized forms of expression are:

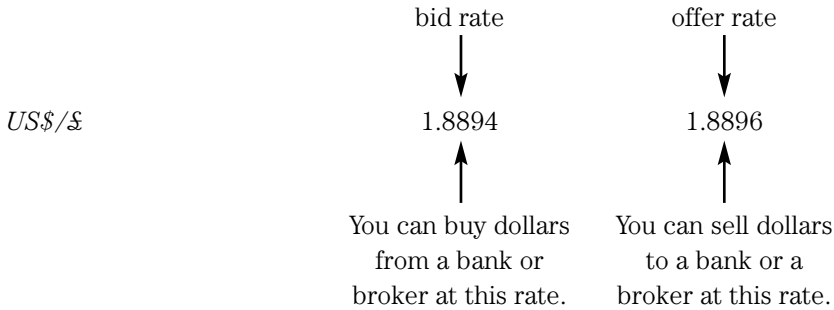
US\$1.89/£  
or  
US\$/£ : 1.89

Exchange rates are expressed in terms of the number of units of the first currency per single unit of the second currency. Also forex rates are normally given to five or six significant figures. So for the US\$/£ exchange rate on 19 February 2004 the more accurate rate is:

US\$1.8895/£

However this is still not accurate enough because currency exchange rates are not generally expressed in terms of a single ‘middle rate’, but are given as a rate at which you can buy the first currency (bid rate) and a rate at which you can sell the first currency (offer rate). In the case of the US\$/£ exchange rate the market rates on 19 February 2004 were:

US\$1.8895/£ 'middle rate'



So if you wished to purchase US\$1m the cost would be:

$$\frac{\$1,000,000}{1.8894} = \text{£}529,269$$

However if you wished to sell US\$1m you would receive:

$$\frac{\$1,000,000}{1.8896} = \text{£}529,213$$

The foreign exchange dealers make profit in two ways. First, they may charge commission on a deal. Depending on the size of the transaction this can vary, but it is generally well below 1 percent. Second, these institutions are dealing with numerous buyers and sellers every day and they make a profit on the difference between the bid price and offer price (the bid/offer spread). In the above example if a dealer sold US\$1m and bought US\$1m with a bid/offer spread of 0.02 of a cent, a profit of  $\text{£}529,269 - \text{£}529,213 = \text{£}56$  is made.

## The spot and forward exchange markets

There are two main forex markets.

- *The 'spot' market* In the spot market transactions take place which are to be settled quickly. Officially this is described as immediate delivery, but this usually takes place two business days after the deal is struck. However, this is reduced to the next morning (Greenwich mean time) for those trades going through CLS.
- *The 'forward' market* In the forward market a deal is arranged to exchange currencies at some future date at a price agreed now. The periods of time are generally one, three or six months, but it is possible to arrange an exchange of currencies at a pre-determined rate many years from now.

Forward transactions represent about one-third to one-half of all forex deals. There are many currencies, however, for which forward quotes are difficult to obtain. The so-called exotic currencies generally do not have forward rates quoted by dealers. These are currencies for which there is little trading

demand to support international business, etc. On the other hand, spot markets exist for most of the world's currencies.

**Spot markets exist for most of the world's currencies.**

The *Financial Times* reports the previous day's trading in the forex market. The figures shown in Exhibit 21.1 relate to dealing on 19 February 2004. Of course by the time a newspaper reader receives the information in this table the rates have changed as the 24-hour markets follow the sun around the world.

The prices shown under the pound columns in Exhibit 21.1 are the middle price of the foreign currency in terms of £1 in London the previous afternoon.<sup>3</sup> So, for instance, the mid price of £1 for immediate delivery is 2.3953 Australian dollars. For the US dollar columns the prices for the pound and euro are the number of dollars per currency unit, either per pound or per one euro. However for other currencies the rate shown is the number of units of the other currency per US\$1 – for example, 1.3325 Canadian dollars per US dollar. For the euro columns the rate shown is the number of units of the other currency per euro – for example the spot mid-rate against the pound is 67.09 pence per euro.

The first forward price (middle price) is given as the 'one month' rate. So you could commit yourself to the sale of a quantity of dollars for delivery in one month at a rate that is fixed at about US\$1.8850 per pound. In this case you will need fewer US dollars to buy £1 in one month's time compared with the spot rate of exchange, therefore the dollar is at a *premium* on the one-month forward rate.

The forward rate for one month shows a different relationship with the spot rate for the South African rand against the pound. Here more rands are required (R12.5816) to purchase £1 in one month's time compared with an 'immediate' spot purchase (R12.5326), therefore the rand on one-month forward delivery is at a *discount*.

The *Financial Times* table lists quotations up to one year, but, as this is an over-the-counter market (see Chapter 20), you are able to go as far forward in time as you wish – provided you can find a counterparty. For some currencies trading in three-month and one-year forwards is so thin as to not warrant a quotation in the table. However for the major currencies such as the US dollar, sterling, the euro, the Swiss franc and the Japanese yen, forward markets can stretch up to ten years. Airline companies expecting to purchase planes many years hence may use this distant forward market to purchase the foreign currency they need to pay the manufacturer so that they know with certainty how much home currency they have to find when the planes are delivered.

The table in Exhibit 21.1 displays standard periods of time for forward rates. These are instantly available and are frequently traded. However forward rates are not confined to these particular days in the future. It is possible to obtain rates for any day in the future, say, 74 or 36 days hence. But this would require a specific quotation from a bank.

(The Special Drawing Rights (SDRs) of the International Monetary Fund (IMF) shown at the bottom of the table are artificial currencies made up from baskets of other currencies.)



## Currency rates

Feb 19	Currency	DOLLAR		EURO		POUND	
		Closing mid	Day's change	Closing mid	Day's change	Closing mid	Day's change
<b>Argentina</b>	(Peso)	2.9400	-0.0025	3.7271	-0.0471	5.5551	-0.0499
<b>Australia</b>	(A\$)	1.2677	+0.0092	1.6071	-0.0071	2.3953	-0.0020
One Month		-	-	0.6004	-0.0074	2.3981	-0.0021
One Year		-	-	1.6655	-0.0078	2.4273	-0.0030
<b>Bahrain</b>	(Dinar)	0.3770	-	0.4780	-0.0056	0.7124	-0.0058
<b>Bolivia</b>	(Boliviano)	7.8560	-	9.9591	-0.1174	14.8439	-0.1206
<b>Brazil</b>	(R\$)	2.9465	+0.0083	3.7353	-0.0334	5.5674	-0.0295
<b>Canada</b>	(C\$)	1.3325	+0.0196	1.6893	+0.0053	2.5179	+0.0171
One Month		1.334	+0.0197	1.6898	+0.0055	2.5149	+0.0177
Three Month		1.3368	+0.0198	1.6904	+0.0054	2.5069	+0.0169
One Year		1.3458	+0.0199	1.6924	+0.0053	2.4665	+0.0162
<b>Chile</b>	(Peso)	578.550	+4.7000	733.428	-2.6210	1093.17	+0.0700
<b>Colombia</b>	(Peso)	2693.90	-5.90	3415.06	-47.84	5090.12	-52.59
<b>Costa Rica</b>	(Colon)	423.890	+0.1300	537.365	-6.1710	800.940	-6.2590
<b>Czech Rep.</b>	(Koruna)	25.8046	+0.2871	32.7125	-0.0175	48.7578	+0.1509
One Month		25.8236	+0.2851	32.7102	-0.0186	48.6784	+0.1537
One Year		26.0626	+0.2841	32.7756	-0.0268	47.7649	+0.1250
<b>Denmark</b>	(DKr)	5.8780	+0.0686	7.4516	+0.0001	11.1065	+0.0403
One Month		5.8834	+0.0684	7.4523	+0.0001	11.0904	+0.0415
Three Month		5.8936	+0.0686	7.4529	-0.0003	11.0524	+0.0384
One Year		5.9299	+0.0700	7.4573	+0.0007	10.8678	+0.0382
<b>Egypt</b>	(Egypt £)	6.1801	-	7.8346	-0.0923	11.6773	-0.0949
<b>Estonia</b>	(Kroon)	12.3424	+0.1438	15.6465	-	23.3210	+0.0845
<b>Hong Kong</b>	(HK\$)	7.7737	+0.0025	9.8547	-0.1130	14.6884	-0.1146
One Month		7.7676	+0.0031	9.8390	-0.1115	14.6422	-0.1108
Three Month		7.7547	+0.0028	9.8064	-0.1123	14.5426	-0.1146
One Year		7.7074	+0.0069	9.6927	-0.1059	14.1254	-0.1055
<b>Hungary</b>	(Forint)	206.054	+1.6140	261.215	-1.0100	389.340	-0.0880
One Month		207.974	+1.5040	263.4363	-1.1649	392.03	-0.2680
One Year		228.859	+2.4840	287.8072	-0.2490	419.431	+1.0780
<b>India</b>	(Rs)	45.2400	-0.0350	57.3508	-0.7212	85.4810	-0.7611
One Month		45.24	-0.0175	57.3045	-0.6951	85.279	-0.7132
One Year		45.4225	+0.0100	57.1221	-0.6641	83.2458	-0.6788
<b>Indonesia</b>	(Rupiah)	8432.50	+30.50	10689.90	-86.90	15933.20	-71.40
One Month		-	-	10681.26	-86.30	15895.55	-68.85
One Year		-	-	10604.48	-86.83	15454.23	-73.14
<b>Iran</b>	(Rial)	8365.00	-	10604.30	-125.10	15805.70	-128.40
<b>Israel</b>	(Shk)	4.4480	+0.0120	5.6387	-0.0512	8.4045	-0.0454
<b>Japan</b>	(Y)	107.300	+1.0300	136.024	-0.2830	202.743	+0.3150
One Month		107.205	+1.0350	135.7951	-0.2665	202.088	+0.3600
Three Month		107	+1.0250	135.3084	-0.2882	200.658	+0.2850
One Year		105.875	+0.9950	133.1455	-0.3114	194.038	+0.2150
<b>Kenya</b>	(Shilling)	76.4000	-	96.8523	-1.1422	144.358	-1.1730
<b>Kuwait</b>	(Dinar)	0.2947	+0.0001	0.3736	-0.0043	0.5568	-0.0044
One Month		0.2949	+0.0001	0.3735	-0.0043	0.5559	-0.0043
One Year		0.2972	+0.0001	0.3737	-0.0044	0.5446	-0.0046
<b>Malaysia</b>	(M\$)	3.8000	-	4.8173	-0.0568	7.1801	-0.0584
<b>Mexico</b>	(New Peso)	10.9605	+0.0515	13.8947	-0.0977	20.7098	-0.0702
One Month		11.0002	+0.0494	13.9338	-0.1002	20.7358	-0.0714
Three Month		11.089	+0.0570	14.0228	-0.0928	20.7953	-0.0638
One Year		11.5255	+0.0545	14.4941	-0.1024	21.1227	-0.0763
<b>New Zealand</b>	(NZ\$)	1.4296	+0.0132	1.8123	-0.0045	2.7012	+0.0031
One Month		-	-	1.8171	-0.0049	2.7042	+0.0029
One Year		-	-	1.8780	-0.0045	2.7368	+0.0028
<b>Nigeria</b>	(Naira)	136.600	-	173.168	-2.0420	258.106	-2.0970
<b>Norway</b>	(Nkr)	6.9684	+0.0951	8.8338	+0.0177	13.1667	+0.0740
One Month		6.9735	+0.0947	8.8331	+0.0176	13.1452	+0.0749
Three Month		6.9811	+0.0949	8.8280	+0.0170	13.0917	+0.0713
One Year		7.0051	+0.0940	8.8094	+0.0153	12.8383	+0.0662
<b>Pakistan</b>	(Rupee)	57.3100	-0.0300	72.6519	-0.8953	108.287	-0.9370
<b>Peru</b>	(New Sol)	3.4720	-0.0026	4.4014	-0.0554	6.5602	-0.0585
<b>Philippines</b>	(Peso)	56.2250	+0.1150	71.2764	-0.6931	106.237	-0.6440
One Month		56.599	+0.1405	71.6927	-0.6616	106.691	-0.5840
Three Month		57.2875	+0.1205	72.4441	-0.7020	107.432	-0.6580
One Year		60.4755	+0.1270	76.0524	-0.7395	110.833	-0.6940
<b>Poland</b>	(Zloty)	3.8563	+0.0453	4.8886	+0.0005	7.2864	+0.0272
One Month		3.8693	+0.0446	4.9011	-0.0003	7.2937	+0.0268
One Year		4.0193	+0.0447	5.0545	-0.0030	7.3661	+0.0211

Feb 19	Currency	DOLLAR		EURO		POUND	
		Closing mid	Day's change	Closing mid	Day's change	Closing mid	Day's change
<b>Romania</b>	(Leu)	31912.10	+313.50	40455.00	-75.00	60298.00	+107.30
<b>Russia</b>	(Rouble)	28.4950	+0.0101	36.1231	-0.4131	53.8413	-0.4182
<b>Saudi Arabia</b>	(SR)	3.7502	-	4.7542	-0.0560	7.0860	-0.0576
One Month		3.7508	-	4.7511	-0.0557	7.0705	-0.0563
One Year		3.7623	+0.0001	4.7314	-0.0559	6.8952	-0.0576
<b>Singapore</b>	(S\$)	1.6846	+0.0078	2.1356	-0.0152	3.1831	-0.0111
One Month		1.684	+0.0078	2.1330	-0.0151	3.1744	-0.0105
One Year		1.6771	+0.0083	2.1090	-0.0145	3.0736	-0.0105
<b>Slovakia</b>	(Koruna)	31.9350	+0.4299	40.4840	+0.0740	60.3412	+0.3287
One Month		32.054	+0.4244	40.6021	+0.0673	60.423	+0.3247
One Year		33.183	+0.4394	41.7300	+0.0647	60.8145	+0.3026
<b>Slovenia</b>	(Tolar)	187.285	+2.0650	237.421	-0.1510	353.875	+1.0590
<b>South Africa</b>	(R)	6.6327	+0.0539	8.4084	-0.0298	12.5326	+0.0011
One Month		6.6744	+0.0504	8.4544	-0.0345	12.5816	-0.0043
Three Month		6.7602	+0.0586	8.5488	-0.0259	12.6776	+0.0066
One Year		7.1427	+0.0651	8.9825	-0.0234	13.0906	+0.0111
<b>South Korea</b>	(Won)	1164.50	+12.35	1476.24	-1.57	2200.32	+5.65
One Month		1166.65	+13.05	1477.77	-0.62	2199.17	+7.26
Three Month		1170.35	+12.85	1479.99	-1.05	2194.77	+6.19
One Year		1187.45	+14.55	1493.30	+0.82	2176.24	+8.66
<b>Sweden</b>	(SKr)	7.2466	+0.0884	9.1865	+0.0050	13.6924	+0.0570
One Month		7.2553	+0.0880	9.1901	+0.0048	13.6763	+0.0577
Three Month		7.2722	+0.0886	9.1962	+0.0047	13.6376	+0.0548
One Year		7.3346	+0.0880	9.2238	+0.0027	13.4421	+0.0499
<b>Switzerland</b>	(SFr)	1.2440	+0.0152	1.5771	+0.0010	2.3506	+0.0099
One Month		1.2432	+0.0153	1.5747	+0.0010	2.3436	+0.0105
Three Month		1.2414	+0.0152	1.5699	+0.0009	2.3282	+0.0096
One Year		1.2329	+0.0152	1.5504	+0.0008	2.2595	+0.0091
<b>Taiwan</b>	(T\$)	33.0700	+0.0250	41.9229	-0.4623	62.4858	-0.4600
One Month		33.03	+0.0750	41.8384	-0.3950	62.2627	-0.3539
One Year		32.415	+0.0750	40.7642	-0.3876	59.407	-0.3589
<b>Thailand</b>	(Bt)	39.1800	+0.1700	49.6685	-0.3677	74.0306	-0.2777
One Month		39.195	+0.1750	49.6474	-0.3586	73.884	-0.2566
One Year		39.275	+0.1700	49.3912	-0.3689	71.9793	-0.2888
<b>Tunisia</b>	(Dinar)	1.2139	+0.0119	1.5389	-0.0028	2.2937	+0.0041
<b>Turkey</b>	(Lira)	1331000	+9500	1687309	-7713	2514925	-2335
<b>UAE</b>	(Dirham)	3.6730	-	4.6563	-0.0550	6.9401	-0.0565
One Month		3.6732	-	4.6527	-0.0547	6.924	-0.0553
One Year		3.6755	-	4.6222	-0.0548	6.7361	-0.0565
<b>UK (0.5292)*</b>	(£)	1.8895	-0.0153	0.6709	-0.0025	-	-
One Month		1.885	-0.0150	0.6720	-0.0025	-	-
Three Month		1.8753	-0.0154	0.6743	-0.0024	-	-
One Year		1.8326	-0.0153	0.6862	-0.0024	-	-
<b>Uruguay</b>	(Peso)	29.4150	-	37.2894	-0.4398	55.5797	-0.4514
<b>USA</b>	(\$)	-	-	1.2677	-0.0150	1.8895	-0.0153
One Month		-	-	1.2667	-0.0149	1.885	-0.0150
Three Month		-	-	1.2646	-0.0149	1.8753	-0.0154
One Year		-	-	1.2576	-0.0149	1.8326	-0.0153
<b>Venezuela †</b>	(Bolivar)	3157.36	+54.66	4002.58	+22.90	5965.82	+55.64
<b>Vietnam</b>	(Dong)	15723.00	-3.00	19932.00	-239.00	29708.60	-247.10
<b>Euro (0.7888)*</b>	(Euro)	1.2677	-0.0150	-	-	1.4905	+0.0054
One Month		1.2667	-0.0149	-	-	1.4882	+0.0055
Three Month		1.2646	-0.0149	-	-	1.4829	+0.0051
One Year		1.2575	-0.0150	-	-	1.4573	+0.0050
<b>SDR</b>	-	0.66720	-	0.84585	-0.0044	1.260800	-

Rates are derived from WM/Reuters at 4pm (London time). \*The closing mid-point rates for the Euro and £ against the \$ are shown in brackets. The other figures in the dollar column of both the Euro and Sterling rows are in the reciprocal form in line with market convention. †Official rate set by Venezuelan government is 1917.60 mid per USD; the WM/Reuters rate is for the valuation of capital assets. Some values are rounded by the FT. The exchange rates printed in this table are also available on the internet at <http://www.FT.com>.

Euro Locking Rates: Austrian Schilling 13.7603, Belgium/Luxembourg Franc 40.3399, Finnish Markka 5.94573, French Franc 6.55957, German Mark 1.95583, Greek Drachma 340.75, Irish Punt 0.0787564, Italian Lira 1936.27, Netherlands Guilder 2.20371, Portugese Escudo 200.482, Spanish Peseta 166.386.

## EXHIBIT 21.1 Currency rates table in the FT

Source: Financial Times, 20 February 2004

## Covering in the forward market

---

Suppose that on 19 February 2004 a UK exporter sells goods to a customer in Norway invoiced at Nkr5,000,000. Payment is due three months later. With the spot rate of exchange at Nkr13.1667/£ (*see* Exhibit 21.1) the exporter, in deciding to sell the goods, has in mind a sales price of:

$$\frac{5,000,000}{13.1667} = \text{£}379,746$$

The UK firm bases its decision on the profitability of the deal on this amount expressed in pounds.

However the rate of exchange may vary between February and May: the size and direction of the move is uncertain. If sterling strengthens against the Norwegian Krone the UK exporter makes a currency loss by waiting three months and exchanging the dollars received into sterling at spot rates in May. If, say, one pound is worth Nkr15 in May the exporter will receive only £333,333:

$$\frac{5,000,000}{15} = \text{£}333,333$$

The loss due to currency movement is:

$$\begin{array}{r} \text{£}379,746 \\ \text{£}333,333 \\ \hline \text{£}46,413 \end{array}$$

If sterling weakens to, say, Nkr11/£ a currency gain is made. The pounds received in May if dollars are exchanged at the spot rate are:

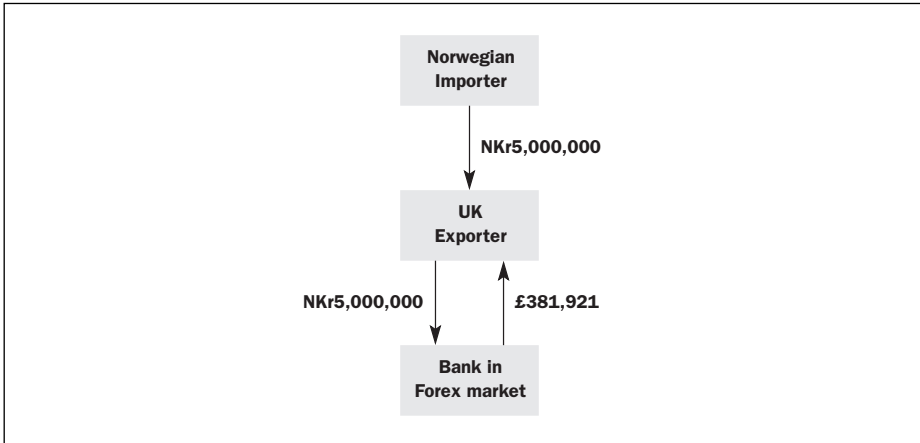
$$\frac{5,000,000}{11} = \text{£}454,545$$

The currency gain is:

$$\begin{array}{r} \text{£}454,545 \\ \text{£}379,746 \\ \hline \text{£}74,799 \end{array}$$

Rather than run the risk of a possible loss on the currency side of the deal the exporter may decide to cover in the forward market at the time of the export (19 February). Under this arrangement the exporter promises to sell Nkr5,000,000 against sterling in three months (the agreement is made on 19 February for delivery of currency in May). The 3-month forward rate available<sup>4</sup> on 19 February 2004 is Nkr13.0917/£ (*see* Exhibit 21.1). This forward contract means that the exporter is assured of the receipt of £381,921 in May regardless of the way in which spot exchange rate change over the three months:

**FIGURE 21.3**  
**Forward market transaction**



$$\frac{5,000,000}{13.0917} = \text{£}381,921$$

In May the transactions shown in Figure 21.3 take place.

From the outset the exporter knew the amount to be received in May (assuming away credit risk). It might, with hindsight, have been better not to use the forward market but to exchange the dollars at a spot rate of, say, Nkr11/£. This would have resulted in a larger income for the firm. But there was uncertainty about the spot rate in May when the export took place in February. If the spot rate in May had turned out to be Nkr15/£ the exporter would have made much less. Covering in the forward market is a form of insurance, which leads to greater certainty – and certainty has a value.

## Types of foreign-exchange risk

There are three types of risk for firms that operate in an international market-place:

- transaction risk
- translation risk
- economic risk.

### Transaction risk

Transaction risk is the risk that transactions already entered into, or for which the firm is likely to have a commitment in a foreign currency, will have a variable value in the home currency because of exchange-rate movements.

This type of risk is primarily associated with imports or exports. If a company exports goods on credit then it carries a figure for debtors in its accounts. The amount it will receive in home-currency terms is subject to uncertainty if the customer pays in a foreign currency.

Likewise a company that imports on credit will have a creditor figure in its accounts. The amount that is finally paid in terms of the home currency depends on forex movements, if the invoice is in a foreign currency. Transaction risk also arises when firms invest abroad, say, opening a new office or manufacturing

## Balance sheets left reeling by Real

Jonathan Wheatley

It has been a bizarre year for Brazilian companies. Whether or not they supported the campaign of president-elect Luiz Inácio Lula da Silva – and many of them did – senior executives have felt the impact of his election even though he does not take office until January 1.

Concern among investors that a left-wing government under Lula – as he is universally known – might presage a default on Brazil's debts has caused the currency to shed more than 40 per cent of its value to the end of September, wreaking havoc on companies' balance sheets.

For most big companies, many of which borrow in dollars but make their income in Reals, the devaluation has been little short of calamitous.

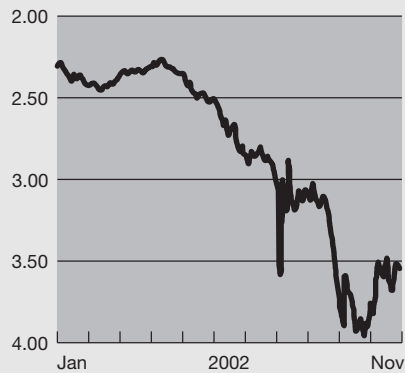
'They are extremely vulnerable,' says Fernando Excel of Económica. 'Even if only a small part of a company's debt is unhedged, a devaluation on this scale causes an enormous disaster.'

Many Brazilian companies began hedging their dollar debts when the Real began to slide during the second quarter, as opinion polls showed Lula leading the presidential campaign. But few imagined that the Real would fall so far.

As the situation worsened and international banks began reducing their exposure to Brazil, the cost of hedging

### Brazilian real

Against the US dollar (R\$ per US\$)



Source: Thomson Datastream; WM/Reuters

became increasingly prohibitive. Many concluded – incorrectly, as it turned out – that hedging was not worth the expense.

Usiminas, one of Brazil's biggest steel producers, saw the value of its sales rise by 37 per cent in the third quarter over last year, to R\$1.68bn. Nevertheless, it recorded a net loss of R\$1.68m, because both the operating company and especially, Cosipa, a subsidiary, were not fully hedged.

'Cosipa is one of the most leveraged companies in the industry. Hedging just became too expensive,' says Katia Brullo of Corretora Unibanco, a Sao Paulo brokerage.

## EXHIBIT 21.2 Balance sheets left reeling by Real

Source: *Financial Times*, 26 November 2002

plant. If the costs of construction are paid for over a period the firm may be exchanging the home currency for the foreign currency to make the payments. The amounts of the home currency required are uncertain if the exchange rate is subject to rate shifts. Also the cash inflows back to the parent are subject to exchange-rate risk.

In addition, when companies borrow in a foreign currency, committing themselves to regular interest and principal payments in that currency, they are exposed to forex risk. This is a problem that beset a number of Brazilian companies in 2002. They had committed themselves to paying off borrowings in a hard currency (e.g. US dollars, sterling). This became a serious problem when the debt rose by 40 percent simply because of the decline in their currency against the hard currency – see Exhibit 21.2.

## Translation risk

Translation risk arises because financial data denominated in one currency are then expressed in terms of another currency. Between two accounting dates the figures can be affected by exchange-rate movements, greatly distorting comparability. The financial statements of overseas business units are usually translated into the home currency so that they might be consolidated with the group's financial statements. Income, expenses, assets and liabilities have to be re-expressed in terms of the home currency. Note that this is purely a paper-based exercise; it is translation and not the conversion of real money from one currency to another. If exchange rates were stable, comparing subsidiary performance and asset position would be straightforward. However, if exchange rates move significantly the results can be severely distorted. For example, Courts, the furniture and electrical retailer, which has 60 percent of its turnover overseas found that even though overseas sales rose 8 percent in local currency terms, when the figures were translated into sterling, a fall of 4 percent was reported. This was mainly because sterling rose against the dollar. See Exhibit 21.3.

**This is purely a paper-based exercise; it is translation and not the conversion of real money from one currency to another.**

There are two elements to translation risk.

- *The balance sheet effect* Assets and liabilities denominated in a foreign currency can fluctuate in value in home-currency terms with forex-market changes. For example, if a UK company acquires A\$1,000,000 of assets in Australia when the rate of exchange is A\$2.2/£ this can go into the UK group's accounts at a value of £454,545. If, over the course of the next year, the Australian dollar falls against sterling to A\$2.7/£, when the consolidated accounts are drawn up and the asset is translated at the current exchange rate at the end of the year it is valued at only £370,370 (1,000,000/2.7) a 'loss' of £84,175. And yet the asset has not changed in value in A\$ terms one jot. These 'losses' are normally dealt with through balance sheet reserves.

## Courts moves to limit foreign exchange damage

By Sophy Buckley

Courts yesterday issued a disappointing trading update for the Christmas and early winter sale period and flagged a full strategic review.

The immediate focus was on news that the weak dollar would cut profits by £4m this year and changes to financing would cost £5m and lift borrowing costs by £1m.

This prompted analysts to cut their profit forecasts for the furniture and

electricals group. Seymour Pierce reduced its numbers from £24m to £14m, and Evolution Beeson Gregory moved from £30m to £22m.

For the six weeks to January 11, the weak dollar turned an 8 per cent rise in overseas sales at constant exchange rates into a 4 per cent fall. A 4 per cent rise in like-for-like sales became an 8 per cent fall when translated into sterling.

### EXHIBIT 21.3 Courts moves to limit foreign exchange damage

Source: *Financial Times* 20 January 2004

- *The profit and loss account effect* Currency changes can have an adverse impact on the group's profits because of the translation of foreign subsidiaries' profits. This often occurs even though the subsidiaries' managers are performing well and increasing profit in terms of the currency in which they operate, as the case of Courts (*see* Exhibit 21.3) indicates.

### Economic risk

A company's economic value may decline as a result of forex movements causing a loss in competitive strength. The worth of a company is the discounted cash flows payable to the owners. It is possible that a shift in exchange rates can reduce the cash flows of foreign subsidiaries and home-based production far into the future (and not just affect the near future cash flows as in transaction exposure). There are two ways in which competitive position can be undermined by forex changes:

- *Directly* If your firm's home currency strengthens then foreign competitors are able to gain sales and profits at your expense because your products are more expensive (or you have reduced margins) in the eyes of customers both abroad and at home.
- *Indirectly* Even if your home currency does not move adversely *vis-à-vis* your customer's currency you can lose competitive position. For example suppose a South African firm is selling into Hong Kong and its main competitor is a New Zealand firm. If the New Zealand dollar weakens against the Hong Kong dollar the South African firm has lost some competitive position.

Another indirect effect occurs even for firms that are entirely domestically oriented. For example, the cafés and shops surrounding a large export-oriented manufacturing plant may be severely affected by the closure of the factory caused by an adverse forex movement.

## Transaction risk strategies

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This section illustrates a number of strategies available to deal with transaction risk by focussing on the alternatives open to an exporter selling goods on credit.

Suppose a UK company exports £1m of goods to a Canadian firm when the spot rate of exchange is C\$2.20/£. The Canadian firm is given three months to pay, and naturally the spot rate in three months is unknown at the time of the shipment of goods. What can the firm do?

### Invoice the customer in the home currency

One easy way to bypass exchange-rate risk is to insist that all foreign customers pay in your currency and your firm pays for all imports in your home currency. In the case of this example the Canadian importer will be required to send £1m in three months.

However the exchange-rate risk has not gone away, it has just been passed on to the customer. This policy has an obvious drawback: your customer may dislike it, the marketability of your products is reduced and your customers look elsewhere for supplies. If you are a monopoly supplier you might get away with the policy but for most firms this is a non-starter.

### Do nothing

Under this policy the UK firm invoices the Canadian firm for C\$2.2m, waits three months and then exchanges into sterling at whatever spot rate is available then. Perhaps an exchange-rate gain will be made, perhaps a loss will be made. Many firms adopt this policy and take a 'win some, lose some' attitude. Given the fees and other transaction costs of some hedging strategies this can make sense.

There are two considerations for managers here. The first is their degree of risk aversion to higher cash flow variability, coupled with the sensitivity of shareholders to reported fluctuations of earnings due to foreign exchange gains and losses. The second, which is related to the first point, is the size of the transaction. If £1m is a large proportion of annual turnover, and greater than profit, then the managers may be more worried about forex risk. If, however, £1m is a small fraction of turnover and profit, and the firm has numerous forex transactions, it may choose to save on hedging costs.

There is an argument that it would be acceptable to do nothing if it was anticipated that the Canadian dollar will appreciate over the three months. Be



**Predicting exchange rates is a dangerous game.**

careful. Predicting exchange rates is a dangerous game and more than one 'expert' has made serious errors of judgment.

## Netting

Multinational companies often have subsidiaries in different countries selling to other members of the group. Netting is where the subsidiaries settle intra-organisational currency debts for the *net* amount owed in a currency rather than the *gross* amount. For example, if a UK parent owned a subsidiary in Canada and sold C\$2.2m of goods to the subsidiary on credit while the Canadian subsidiary is owed C\$1.5m by the UK company, instead of transferring a total of C\$3.7m the intra-group transfer is the net amount of C\$700,000 (see Figure 21.4).

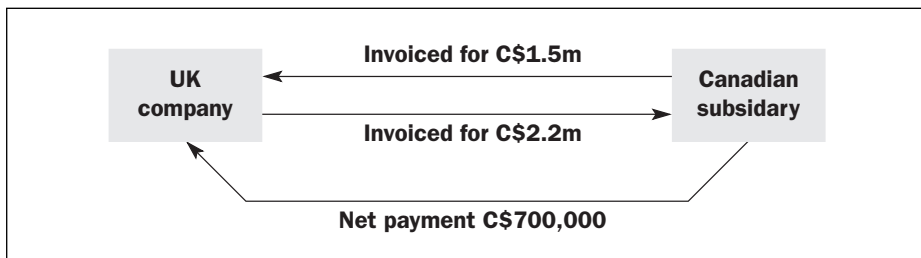
The reduction in the size of the currency flows by offsetting inflows and outflows in the same currency diminishes the net exposure that may have to be hedged. It also reduces the transaction costs of currency transfers in terms of fees and commissions.

This type of netting, involving two companies within a group, is referred to as bilateral netting, and is simple to operate without the intervention of a central treasury. However for organizations with a matrix of currency liabilities between numerous subsidiaries in different parts of the world, multilateral netting is required. A central treasury is usually needed so that there is knowledge at any point in time of the overall exposure of the firm and its component parts. Subsidiaries will be required to inform the group treasury about their overseas dealings, which can then co-ordinate payments after netting out intra-company debts. The savings on transfer costs levied by banks can be considerable.

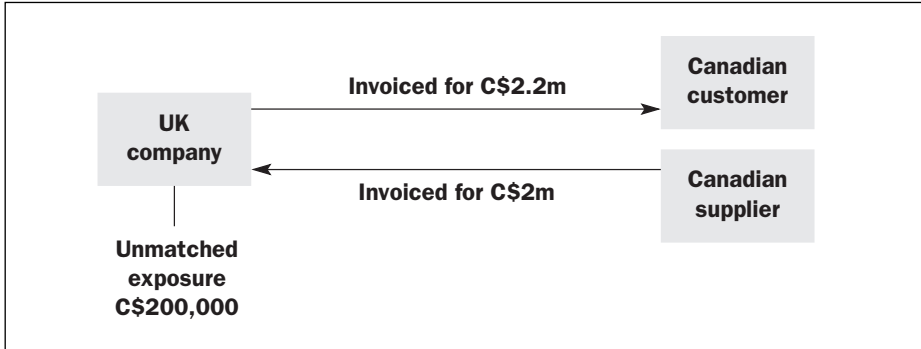
## Matching

Netting only applies to transfers within a group of companies. Matching can be used for both intra-group transactions and those involving third parties. The company matches the inflows and outflows in different currencies caused by

**FIGURE 21.4**  
**Netting**



**FIGURE 21.5**  
**Matching**



trade, etc., so that it is only necessary to deal on the forex markets for the unmatched portion of the total transactions.

So if, say, the Canadian importer is not a group company and the UK firm also imported a raw material from another Canadian company to the value of C\$2m it is necessary only to hedge the balance of C\$200,000 (see Figure 21.5).

Naturally, to net and match properly, the timing of the expected receipts and payments would have to be the same.

### Leading and lagging

Leading is the bringing forward from the original due date the payment of a debt. Lagging is the postponement of a payment beyond the due date. This speeding up or delaying of payments is particularly useful if you are convinced exchange rates will shift significantly between now and the due date.

So, if the UK exporter who invoiced a Canadian company for C\$2.2m on three months' credit expects that the Canadian dollar will fall over the forthcoming three months it may try to obtain payment immediately and then exchange for sterling at the spot rate. Naturally the Canadian firm will need an incentive to pay early and this may be achieved by offering a discount for immediate settlement.

An importer of goods in a currency that is anticipated to fall in value may attempt to delay payment as long as possible. This may be achieved either by agreement or by exceeding credit terms.

### Forward market hedge

Although other forms of exchange-risk management are available, forward cover represents the most frequently employed method of hedging. A contract is agreed to exchange two currencies at a fixed time in the future at a predetermined rate. The risk of forex variation is removed.

So if the three-month forward rate is C\$2.25/£ the UK exporter could lock in the receipt of £977,778 in three months by selling forward C\$2.2m.

$$\frac{\text{C\$2.2m}}{2.25} = \text{£977,778}$$

No foreign exchange-rate risk now exists because the dollars to be received from the importer are matched by the funds to be exchanged for sterling. (There does remain the risk of the importer not paying, at all or on time, and the risk of the counterparty in the forex market not fulfilling its obligations.)

### Money market hedge

Money market hedging involves borrowing in the money markets. For example, the exporter could, at the time of the export, borrow in Canadian dollars on the money markets for a three-month period. The amount borrowed, plus three months' interest, will be designed to be equal to the amount to be received from the importer (C\$2.2m).

**Money market hedging involves borrowing in the money markets.**

If the interest rate charged over three months is 2 percent then the appropriate size of the loan is:

$$\begin{aligned} \text{C\$2.2m} &= \text{C\$?}(1+0.02) \\ \text{C\$?} &= \frac{\text{C\$2.2m}}{1.02} = \text{C\$2,156,863} \end{aligned}$$

Thus the exporter has created a liability (borrowed funds) that matches the asset (debt owed by Canadian firm).

The borrowed dollars are then converted to sterling on the spot market for the exporter to receive £980,392 immediately:

$$\frac{\text{C\$2,156,863}}{2.2} = \text{£980,392}$$

The exporter has removed forex risk because it now holds cash in sterling.

Three months later C\$2.2m is received from the importer and this exactly matches the outstanding debt:

Amount borrowed + interest = debt owed at end of period

$$\text{C\$2,156,863} + \text{C\$2,156,863} \times 0.02 = \text{C\$2.2m}$$

The receipt of £980,392 is £19,608 less than the £1m originally anticipated. However it is received three months earlier and can earn interest.

The steps in the money market hedge are as follows.

1. Invoice customer for C\$2.2m.
2. Borrow C\$2,156,863.
3. Sell C\$2,156,863 at spot to receive pounds now.
4. In three months receive C\$2.2m from customer.
5. Pay lender C\$2.2m.

An importer could also use a money market hedge. So a Swiss company importing Japanese cars for payment in yen in three months could borrow in Swiss francs now and convert the funds at the spot rate into yen. This money is deposited to earn interest, with the result that after three months the principal plus interest equals the invoice amount.

## Futures

A foreign currency futures contract is an agreement to exchange a specific amount of a currency for another at a fixed future date for a predetermined price. Futures are similar to forwards in many ways. They are, however, standardized contracts traded on regulated exchanges. Forwards can be tailor-made in a wide range of currencies as to quantity of currency and delivery date, whereas futures are only available in a limited range of currencies and for a few specific forward time periods.

The Chicago Mercantile Exchange (CME) and the FINEX market (New York Board of Trade) operate futures markets in currencies including: US\$/£, US\$/¥, US\$/SFr (Swiss franc), US\$/€. A single futures contract is for a fixed amount of currency. For example, a sterling contract on CME is for £62,500. It is not possible to buy or sell a smaller amount than this, nor to transact in quantities other than whole-number multiples of this. On the CME to buy a sterling futures contract is to make a commitment to deliver a quantity of US dollars and receive in return £62,500. On 19 February 2004 the CME quoted contracts for delivery in late March and June (and for no months in between)<sup>5</sup> – see last two lines on Exhibit 21.4. For example, the June contract was priced at 1.8766 (the ‘open’ column indicates the rate at the start of trading on 19 February). This means that if you *buy* one contract you are committed to deliver US\$1.8766 for every pound of the £62,500 you will receive in late June, that is US\$117,287.50. If you *sold* one contract at 1.8766 you would deliver £62,500 and receive US\$117,287.50.

## Currency futures

Feb 19		Open	Latest	Change	High	Low	Est. vol.	Open int.
€-Sterling*	Mar	0.6730	0.6713	-0.0020	0.6726	0.6714	513	11,894
€-Dollar*	Mar	1.2710	1.2690	+0.0010	-	0.0000	302	734
€-Yen*	Mar	135.15	135.99	+0.72	135.48	135.48	859	10,652
\$-Can \$ †	Mar	0.7550	0.7522	-0.0016	0.7557	0.7483	7,658	58,873
\$-Euro € †	Mar	1.2690	1.2692	-0.0004	1.2728	1.2639	14,112	144,529
\$-Euro € †	Jun	1.2674	1.2662	-0.0004	1.2695	1.2611	195	1,980
\$-Sw Franc †	Mar	0.8061	0.8056	-0.0012	0.8085	0.8026	5,116	46,593
\$-Sw Franc †	Jun	0.8090	0.8074	-0.0012	0.8091	0.8045	27	433
\$-Yen †	Mar	0.9377	0.9330	-0.0044	0.9412	0.9313	11,921	146,746
\$-Yen †	Jun	0.9421	0.9357	-0.0044	0.9426	0.9343	106	9,110
\$-Sterling †	Mar	1.8860	1.8911	+0.0077	1.8944	1.8831	3,835	69,250
\$-Sterling †	Jun	1.8708	1.8766	+0.0076	1.8801	1.8695	17	553

Sources: \*FINEX; Sterling €100,000, Dollar: €200,000 and Yen: €100,000. †CME: Canadian \$: C\$100,000, Euro: €125,000; Swiss Franc: SFr125,000; Yen: ¥12.5m (\$ per ¥100); Sterling: £62,500. CME volume, high & low for pit & electronic trading at settlement. Contracts shown are based on the volumes traded in 2001.

### EXHIBIT 21.4 Currency futures on the Chicago Mercantile Exchange and FINEX

Source: *Financial Times* 20 February 2004

A firm hedging with currency futures will usually attempt to have a futures position which has an equal and opposite profit profile to the underlying transaction. Frequently the futures position will be closed before delivery is due, to give a cash profit or loss to offset the spot market profit or loss (for more details on futures see Chapter 20) – although physical delivery of the currency is possible. For example, if a US firm exports £62,500 worth of goods to a UK firm in February on four months' credit for payment in late June and the current spot exchange rate is US\$1.8895/£ there is a foreign exchange risk. If the June future is trading at a price of US\$1.8766 per £ the exporter's position could be hedged by selling one sterling futures contract on CME.

If in June sterling falls against the dollar to US\$1.60/£ the calculation is:

Value of £62,500 received from customer when converted to dollars at spot in June ( $£62,500 \times 1.60$ )	US\$100,000
Amount if exchange rate was constant at US\$1.8895/£	US\$118,094
Forex loss	US\$18,094

However an offsetting gain is made on the futures contract:

Sold at US\$1.8766/£ ( $£62,500 \times 1.8766$ )	US\$117,288
Bought in June to close position at US\$1.60/£ ( $£62,500 \times 1.60$ )	US\$100,000
Futures gain	US\$17,288

Alternatively the exporter could simply deliver the £62,500 received from the importer to CME in return for US\$117,288. (Note that the futures contract rate of exchange in June converges with the spot rate at the date of expiry, in late June, i.e. US\$1.60/£.)

In the above example a perfect hedge was not achieved because the gain on the futures contract did not exactly offset the loss on the underlying position (i.e. the pounds to be received from the UK customer). Perfect hedging is frequently unobtainable with futures because of their standardized nature. Perhaps the amount needed to be hedged is not equal to a whole number of contracts, for example £100,000, or the underlying transaction takes place in November (when no future is available).

**Perfect hedging is frequently unobtainable with futures because of their standardized nature.**

Futures did not prove very popular in the UK when traded on LIFFE. This was largely due to the existence of more flexible and convenient forms of currency hedges such as forwards and currency options.

## Currency options

The final possible course of action to reduce forex transaction risk to be discussed in this chapter is to make use of the currency option market.

A currency option is a contract giving the buyer (that is, the holder) the right, but not the obligation, to buy or sell a specific amount of currency at a specific exchange rate (the strike price), on a specified future date.<sup>6</sup>

A call option gives the right to buy a particular currency.

A put option gives the right to sell a particular currency.

The option writer (usually a bank) guarantees, if the option buyer chooses to exercise the right, to exchange the currency at the predetermined rate. Because the writer is accepting risk the buyer must pay a premium to the writer – normally within two business days of the option purchase. (For more details on options see Chapter 20.)

Currency options premiums are shown for the currency rates between the US\$ and the euro, the US\$ and the Yen and the US\$ and the UK pound in the *Financial Times* – see Exhibit 21.5. This data is taken from the trading system of the Chicago Mercantile Exchange (CME). For the US\$/UK£ call options the purchaser has the right but not the obligation to purchase pounds for dollars. The call holder has a number of possible rates of exchange open to himself/herself. The ones shown in the FT (\$1.8700/£ to \$1.9000/£) represent just a few of the possibilities. The premiums payable, shown in the body of the table, are quoted as US cents per pound. One contract is for £62,500, and you are only

able to purchase whole numbers of contracts on the exchange. If you purchased a 1870 call option for expiry in April you would pay a premium of 2.64 US cents per UK pound (the total premium payable would be  $\$0.0264 \times 62,500 = \$1,650$ ) giving you the right to buy pounds with dollars in April at a rate of  $\$1.8700/\pounds$ . Note that a less favorable exchange rate, e.g. 1880 commands a lower premium, only 2.16 cents per pound under the contract.

The purchase of a put option gives you the right but not the obligation to *sell* pounds and receive dollars. Again the quantity of a contract is for  $\pounds 62,500$ .

## Currency options

### ■ US \$/€ OPTIONS (CME)

Strike price	CALLS			PUTS		
	Feb 19	Mar	Apr	May	Mar	Apr
12500	2.44	3.03	–	0.46	1.35	–
12600	1.72	2.46	–	0.82	1.80	–
12700	1.15	1.95	–	1.32	2.21	–
12800	0.74	1.48	2.00	1.80	2.86	–

Previous day's data: volume, 2,359; calls, 5,250 puts, 7,609; open interest, 80,162. Source: Reuters/CME.

### ■ US \$/YEN OPTIONS (CME)

Strike price	CALLS			PUTS		
	Feb 19	Mar	Apr	May	Mar	Apr
9200	1.50	2.38	2.58	0.19	0.46	0.58
9300	0.87	1.65	–	0.47	0.78	1.00
9400	0.31	1.02	–	0.96	1.09	1.40
9500	0.12	0.61	–	1.43	1.90	–

Previous day's data: volume, 1,742; calls, 1,033 puts, 2,775; open interest, 43,064. Source: Reuters/CME.

### ■ US \$/UK£ OPTIONS (CME)

Strike price	CALLS			PUTS		
	Feb 19	Mar	Apr	May	Mar	Apr
1870	2.48	2.64	–	0.71	2.74	–
1880	2.16	2.26	–	1.14	–	–
1890	1.44	1.90	–	1.56	–	–
1900	1.24	–	–	2.74	–	–

Previous day's data: volume, 1,007; calls, 278 puts, 1,285; open interest, 11,826. Source: Reuters/CME

## EXHIBIT 21.5 Currency options displayed in the *Financial Times*

Source: *Financial Times* 20 February 2004

The \$/€ call and put premiums are quoted as US cents per euro under the contract. One contract is for €125,000. The yen contracts are different in that the quoted premiums are US cents per 100 yen. Each contract is for 12.5m yen.

The CME quotes option prices for many more exchange rates than those shown in the FT – see [www.cme.com](http://www.cme.com).

The crucial advantage an option has over a forward is the absence of an obligation to buy or sell. It is the option buyer's decision whether to exercise the option and insist on exchange at the strike rate or to let the option lapse.

With a forward there is a hedge against both a favorable and an unfavorable movement in forex rates. This means that if the exchange rate happens to move in your favor after you are committed to a forward contract you cannot take any advantage of that movement. We saw above that if the forward rate was C\$2.25/£ the exporter will receive £977,778 in three months. If the spot exchange rate had moved to, say, C\$1.9/£ over the three months the exporter would have liked to abandon the agreement to sell the dollars at C\$2.25/£, but is unable to do so because of the legal commitment. By abandoning the deal and exchanging at spot when the Canadian firm pays the exporter will receive an income of:

$$\frac{\text{C\$2.2m}}{1.9} = \text{£1,157,895}$$

This is an extra £180,117.

An option permits both:

- hedging against unfavorable currency movement; and
- profit from favorable currency movement.

### Worked example 21.1 CURRENCY OPTION CONTRACT

Now, imagine that the treasurer of the UK firm hedges by buying a three-month sterling call option giving the right but not the obligation to deliver Canadian dollars in exchange for pounds with a strike price of C\$2.25/£ when the goods are delivered to the Canadian firm in February.

To induce a bank to make the commitment to exchange at the option holder's behest a premium will need to be paid up front. Assume this is 2% of the amount covered, that is a non-refundable  $0.02 \times \text{C\$2,200,000} = \text{C\$44,000}$  is payable two business days after the option deal is struck.

*Three months later*

The dollars are delivered by the importer on the due date. The treasurer now has to decide whether or not to exercise the right to exchange those dollars for sterling at C\$2.25/£. Let us consider two scenarios:



### Scenario 1

The dollar has strengthened against the pound to C\$1.9/£. If the treasurer exercises the right to exchange at C\$2.25/£ the UK firm will receive:

$$\frac{\text{C}\$2,200,000}{2.25} = \text{£}977,778$$

If the treasurer takes the alternative and lets the option lapse – ‘abandons it’ – and exchanges the dollars in the spot market, the amount received will be:

$$\frac{\text{C}\$2,200,000}{1.9} = \text{£}1,157,895$$

Clearly in this case the best course of action would be not to exercise the option, but to exchange at spot rate. Note that the benefit of this action is somewhat reduced by the earlier payment of C\$44,000 for the premium.

### Scenario 2

Now assume that the dollar has weakened against sterling to C\$2.5/£. If the treasurer contacts the bank (the option writer) to confirm that the exporter wishes to exercise the option the treasurer will arrange delivery of C\$2,200,000 to the bank and will receive £977,778 in return:

$$\frac{\text{C}\$2,200,000}{2.25} = \text{£}977,778$$

The alternative, to abandon the option and sell the C\$2.2m in the spot forex market, is unattractive:

$$\frac{\text{C}\$2,200,000}{2.5} = \text{£}880,000$$

Again, the option premium needs to be deducted to give a more complete picture.

With the option, the worst that could happen is that the exporter receives £977,778, less the premium. However the upside potential is unconstrained.

Option contracts are generally for sums greater than US\$1m on the OTC (over-the-counter) market (direct deals with banks) whereas one contract on CME is, for example, for £62,500. The drawback with exchange-based derivatives is the smaller range of currencies available and the inability to tailor-make a hedging position.

Exhibit 21.6 discusses the attitude of some treasurers and analysts to hedging forex risk.

## To hedge or not to hedge

**There is a range of futures, swaps and currency options from which to choose.**

Simon Kuper

A company can expend blood, sweat and tears on achieving a 15 per cent rise in exports. But when it converts its foreign income into its home currency, it may be in for a nasty shock. If its domestic currency has risen by 15 per cent, all the extra profits will be wiped out.

The phenomenon is called currency risk. Corporate treasurers, the people who manage this risk for their companies, have a much more complicated life now than they did a decade ago, says Mr John Parry, director of Rostron Parry, a consultancy specialising in financial markets and derivatives.

Ten years ago there was little more a treasurer could do to hedge risk than buy a currency forward – that is, to set a price today for which he agreed to buy the currency at a certain time in the future. Now there is a range of futures, swaps and currency options from which to choose.

Perhaps the form of hedging that is growing fastest is the currency option. It gives a company the right to buy or sell a currency at a set price at a certain time in the future. This can be expensive: a 'plain vanilla' option can cost 4 per cent of the amount of pounds the user needs to buy.

But before treasurers even look into ways of hedging risk, they are faced with a big question: should they bother? Some companies never hedge, choosing instead to live with currency risk. They argue that while exchange rates sometimes move against them, they sometimes change in their favour. For instance, if the pound falls, a UK company will see the value of its foreign earnings rise when it converts

them into sterling. To have hedged would have meant to lose these windfall gains.

UK and US companies would have mostly gained from leaving their currency exposure unhedged in recent years, as the pound and dollar have tended to fall. But there was a turnaround in recent months, when the pound's surge hit UK exporters. According to foreign exchange advisers, most have never hedged. Profits have been sliced at many companies.

Critics of hedging currency risk often cite companies which have come a cropper from dabbling in derivatives. Allied Lyons, the UK foods company, lost \$150m after currency options positions went wrong in 1991. Orange County in California, the Belgian government, and the unlucky Nick Leeson of Barings Bank are no advertisements for buying 'derivatives' either. 'Mention the word "derivatives" around a board table and everybody freezes,' says Mr Jeremy Wagener, director-general of the UK's Association of Corporate Treasurers.

The Allied Lyons affair has made UK companies more wary of derivatives than their rivals are in France, the US and Scandinavia, according to bankers. Even a company as large as British Steel proclaims proudly that it never uses currency options. 'We don't go in for anything fancy,' it says. 'We only buy straightforward forwards.'

Companies outside the UK often regard their currency management side as a profit centre, says Ms Lisa Danino, a saleswoman at Bank of America. She adds: 'In sophistication, the UK corporates are quite a way behind.'

Small businesses tend to be those most frightened of hedging. 'They often have no treasurer and no thoughts on the subject at all,' says Mr Wagener. Mr Michele di Stefano, head of forex sales at BZW, says: 'In most cases, treasury operations are understaffed.' Even treasurers who themselves understand complex hedging products have to be able to explain them to their directors, often a tricky task.

Nor can customers always trust banks to give them impartial advice on derivatives. The banks, after all, are trying to sell products. Mr Bill McLuskie, treasurer of Canary Wharf Ltd in the UK, claims: 'I know bankers who say, "Given the quality of some treasurers, it's easy to con them".'

Mr McLuskie and Mr Wagener nonetheless preach the virtues of hedging currency risk. The main thing a

company is buying is certainty, they say. No longer can its cash flow stall and start depending on which way the forex market moves. To hedge is to buy insurance, says Mr Wagener. A risk-averse company should hedge; a company with risk-appetite may well consider not doing so.

Many people regard buying currency derivatives as 'speculation', says Mr McLuskie. In fact, he argues, the opposite is true. *Not* to buy the products is to speculate on the foreign exchange market. And most companies have no special insight into which way a currency will move. Mr Parry says: 'Your job as a producer of goods and services is not to second-guess the foreign exchange markets.'

Mr Parry says: 'The question in the end is what value you put on being able to sleep at night when the markets are moving all over the place.'

### EXHIBIT 21.6 To hedge or not to hedge

Source: *Financial Times* 18 April 1997

## Managing translation risk

The effect of translation risk on the balance sheet can be lessened by matching the currency of assets and liabilities. For example, Graft plc has decided to go ahead with a US\$190m project in the USA. One way of financing this is to borrow £100m and exchange this for dollars at the current exchange rate of US\$1.9/£. Thus at the beginning of the year the additional entries into the consolidated accounts are as shown in Worked Example 21.2.

### Worked example 21.2 TRANSLATION RISK

#### Opening balance sheet

<i>Liabilities</i>		<i>Assets</i>	
Loan	£100m	US assets	£100m

The US\$190m of US assets are translated at US\$1.9/£ so all figures are expressed in the parent company's currency.

Now imagine that over the course of the next year the dollar depreciates against sterling to US\$2.30/£. In the consolidated group accounts there is still a £100m loan but the asset bought with that loan, while still worth US\$190m,<sup>7</sup> is valued at only £82.61m when translated into sterling. In the parent company's currency terms, £17.39m needs to be written off:

#### Year-end balance sheet

<i>Liabilities</i>		<i>Assets</i>	
Loan	£100m	US assets	£100m
	<u>£100m</u>		<u>£82.61m</u>
Forex loss	-£17.39m		

Alternatively Graft plc could finance its dollar assets by obtaining a dollar loan. Thus, when the dollar depreciates, both the asset value and the liability value in translated sterling terms becomes less.

#### Opening balance sheet

<i>Liabilities</i>		<i>Assets</i>	
Loan	£100m	US assets	£100m

If forex rates move to US\$2.30/£:

#### Year-end balance sheet

<i>Liabilities</i>		<i>Assets</i>	
Loan	£82.61m	US assets	£82.61m

There is no currency loss to deal with.

One constraint on the solution set out in Worked Example 21.2 is that some governments insist that a proportion of assets acquired within their countries is financed by the parent firm. Another constraint is that the financial markets in some countries are insufficiently developed to permit large-scale borrowing.

Many economists and corporate managers believe that translation hedging is unnecessary because, on average over a period of time, gains and losses from forex movements will even out to be zero. Exhibit 21.7 considers the reasons for most companies taking no steps to hedge against profit translation risk.

## When a hedge is not a gardener's problem

Richard Adams

As the half-yearly company reporting season has got under way, so too have the protests from UK companies that the strength of sterling is cutting profits.

BOC, the gas producer, estimated that sterling's rapid rise in the last 12 months would cut £46m off its annual profits because of the cost of translating foreign currency earnings into sterling.

But, as one letter writer to the *Financial Times* recently asked, surely UK companies could avoid these problems by hedging their currency exposure, using financial instruments to protect against exchange rate fluctuations?

In fact, exporters use a number of techniques to lower currency risks. An engineering firm exporting machinery to Germany, for example, could price its contracts in sterling and shift the exchange rate risk on to its customers. Exporters can also buy forward contracts for an exchange rate fixed at a future date.

An unpublished survey of corporate treasurers by Record Treasury Management, a London consultancy, found that 77 per cent of respondents used forward contracts and other currency derivatives.

But Les Halpin, chief executive of RTM, said while many companies were happy to use derivatives to hedge their cash positions, almost none was prepared to use similar instruments to protect profits earned overseas.

The result is companies with substantial overseas operations, such as BOC, Imperial Chemical Industries and Reuters, have reported translation losses in converting foreign profits. ICI said interim pre-tax profits were down £90m because of the rapid rise in sterling. It attributed £30m to the translation into sterling.

So why not use derivatives to hedge translation costs? UK companies rarely do, according to Mr Halpin, because they often don't understand them.

The RTM survey found that 30 per cent said 'complexity' was the main risk in using derivatives. 'Most company executives think a hedge is something they get their gardener to trim,' grumbled one City equities analyst.

Another 35 per cent of treasurers said 'lack of control' was a significant risk – the fear that the spirit of Nick Leeson may live in a graduate trainee within the finance department. Since future profit levels are unknown, deciding how much to hedge is one barrier.

Sandvik, the Swedish industrial group, was recently caught out by currency hedging, as it reported an 18 per cent fall in first-half profits. In its case, the weakening of the krona meant its hedged positions made a loss.

UK finance directors are reluctant to hedge for several reasons. Profits lost in translation can often be 'paper losses' – it is only when the profits are converted into sterling that a loss is made. And there are complex accounting problems for representing derivatives on balance sheets, especially for instruments spanning several years.

But the most important reservation may be psychological.

If a corporate treasurer gets permission to hedge overseas earnings, and a currency shift makes the hedge unnecessary, then the cost and blame for the decision can be easily identified. But if the treasurer decides not to hedge, then the company is at the whim of the currency markets, an act of God for which no one is responsible.

Ironically, many corporate treasurers are happy to let their organisations dabble

in currency speculation – even though treasurers are no better than anyone else in predicting rate movements.

In 1996, RTM asked them to predict sterling's rate against the D-Mark in a year's time. The highest reply was DM2.50. A year later, the pound rose above DM3.02 – 25 per cent more than the average forecast of DM2.40.

Hedging cannot protect a company from extended currency movements.

John Rennocks, finance director of British Steel, said: 'Hedging is an important part of any exporter's business activity, but can only defer the impact of violent currency swings.'

But, Mr Halpin replied, well judged hedging can give a company 'breathing space', enabling it to take decisions on moving production or resources before the full impact of a currency swing is felt.

### EXHIBIT 21.7 When a hedge is not a gardner's problem

Source: *Financial Times* 18 August 1997

## Managing economic risk

Economic exposure is concerned with the long-term effects of forex movements on the firm's ability to compete, and add value. These effects are very difficult to estimate in advance, given their long-term nature, and therefore the hedging techniques described for transaction risk are of limited use. The forwards markets may be used to a certain extent, but these only extend for a short period for most currencies. Also the matching principle could be employed, whereby overseas assets are matched as far as possible by overseas liabilities.

The main method of insulating the firm from economic risk is to position the company in such a way as to maintain maximum flexibility – to be able to react to changes in forex rates which may be causing damage to the firm. Internationally diversified firms may have a greater degree of flexibility than those based in one or two markets. For example, a company with production facilities in numerous countries can shift output to those plants where the exchange rate change has been favorable. The international car assemblers have an advantage here over the purely domestic producer.

Forex changes can impact on the costs of raw materials and other inputs. By maintaining flexibility in sourcing supplies a firm could achieve a competitive advantage by deliberately planning its affairs so that it can switch suppliers quickly and cheaply.

**Forex changes can impact on the costs of raw materials and other inputs.**

An aware multinational could allow for forex changes when deciding in which countries to launch an advertising campaign. For example, it may be pointless increasing marketing spend in a country whose currency has depreciated rapidly recently, making the domestically produced competing product relatively cheap. It might also be sensible to plan in advance the company's response to a forex movement with regard to the pricing of goods so that action can be rapid. For example, a UK company

**Being prepared may avert an erroneous knee-jerk decision.**

exporting to Norway at a time when sterling is on a rising trend can either keep the product at the same price in sterling terms to maintain profits and face the consequential potential loss of market share, or reduce the sterling price to maintain a constant price in krone and thereby keep its market share. Being prepared may avert an erroneous knee-jerk decision. PSA Peugeot Citroen chose to reduce UK sales rather than price when the euro was high against the pound in 2003.

The principle of contingency planning to permit quick reaction to forex changes applies to many areas of marketing and production strategies. This idea links with the notion of the real option described in Chapter 20. The option to switch sources of supply and output, or to change marketing focus, may have a high value. Despite the cost of creating an adaptable organization, rather than a dedicated fixed one, the option to switch may be worth far more in an uncertain world.

Exhibit 21.8 describes the moves made by a number of UK companies to reduce their economic risk exposure by setting up manufacturing operations in a range of countries.

## A test of company strategy

Peter Marsh

The US employees of Industrial Acoustics Company, a Winchester-based business that is a world leader in making noise-proof enclosures for installations such as jet testing centres and power stations, could soon be among the beneficiaries of the dollar's weakening.

Brian Quarendon, the company's chief executive, says he is considering switching the manufacture of anti-noise products to IAC's New York plant to meet strong demand from the Middle East. They will be made more cheaply in the US than in the company's factories in the UK and continental Europe. We are hoping for another \$25m worth of business in the Middle East in the next two years. The way the dollar has been moving, I envisage most of this being produced from the US,' says Mr Quarendon.

IAC's reaction to the dollar's fragility illustrates the way company managers are thinking about altering their strategies now that several years of relative currency stability appear to be ending. If the dollar's weakness continues and the euro maintains its new-found robustness, how much opportunity does this give UK-based businesses to change the way they operate?

In the short term, the winners are UK-based companies exporting to the rest of Europe. The losers are those selling to dollar-denominated regions, including China and other nations in south-east Asia.

But according to Sir David Lees, chairman of the GKN engineering group, many UK companies are now so internationally spread that they are highly unlikely to make big changes in strategy on the back of short-term currency shifts.

'In GKN's case, we would never decide to switch production from our plants in Germany to the US on the grounds that the dollar has become weak,' says Sir David. 'In six months' time, the situation could reverse and we'd have to switch back again.'

The case of Imperial Chemical Industries shows how globalisation strategies provide inbuilt protection against currency swings. Two decades ago, any sudden weakening of sterling against continental European currencies would have boosted ICI, which was then a large maker of commodity chemicals sold globally but produced mainly in the UK. Today ICI mainly makes smaller-volume, high-value materials that are produced in plants around the world and used in markets close by. Therefore, the company says, the dollar's weakness makes little difference to how it seeks to run its business.

JCB, the UK's biggest maker of construction machinery, is another case in point. Until four years ago, all the company's plants were in Britain, giving the business much more exposure to changes in exchange rates. JCB now has several factories outside the UK, including a US plant employing 200.

'To some degree we anticipated the kind of change [the dollar weakening] that we have seen in the past few months,' says John Patterson, JCB's chief executive. 'Having our own US factory puts us in a much better position to respond if currencies move in an unexpected manner.'

In the past few years, many UK-based manufacturers have also sourced more parts from companies based in continental Europe, capitalising on the euro's relative weakness at the time.

Because UK industry has spread its risk to currency swings in this way, Harry Rawlinson, managing director of Aqualisa, a Kent-based shower manufacturer, says that today 'it is a moot point' whether it is in the best interests of UK industry for the pound to be strong or weak against the euro.

If most of UK industry has less reason to worry about currency swings than in the past, most industrial managers would argue that this is how it should be: rather than spend time fretting about the ups and downs of currencies, they can get on with making and selling better products.

## EXHIBIT 21.8 A test of company strategy

Source: *Financial Times* 10/11 January 2004

## Conclusion

Managers need to be aware of, and to assess, the risk to which their firms are exposed. The risk that arises because exchange rates move over time is one of the most important for managers to consider. Once the extent of the exposure is known managers then need to judge what, if anything, is to be done about it. Sometimes the threat to the firm and the returns to shareholders are so great as to call for robust risk-reducing action. In other circumstances the cost of hedging outweighs the benefit. Analyzing and appraising the extent of the problem and weighing up alternative responses are where managerial judgment comes to the fore.

**Managers need to be aware of, and to assess, the risk to which their firms are exposed.**



Knowledge of derivatives markets and money markets, and of the need for flexible manufacturing, marketing and financing structures, is useful background, but the key managerial skill required is discernment in positioning the company to cope with forex risk. The ability sometimes to stand back from the fray, objectively assess the cost of each risk-reducing option and say, 'No, this risk is to be taken on the chin because in my judgment the costs of managing the risk reduce shareholder wealth with little to show for it,' is sometimes required.

## Websites

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<a href="http://www.bis.org">www.bis.org</a>	Bank for International Settlements
<a href="http://www.bloomberg.co.uk">www.bloomberg.co.uk</a>	Bloomberg
<a href="http://www.reuters.co.uk">www.reuters.co.uk</a>	Reuters
<a href="http://www.ft.com">www.ft.com</a>	<i>Financial Times</i>
<a href="http://www.bankofengland.co.uk">www.bankofengland.co.uk</a>	Bank of England
<a href="http://www.ecb.int">www.ecb.int</a>	European Central Bank
<a href="http://www.nybot.com">www.nybot.com</a>	New York Board of Trade (FINEX)
<a href="http://www.cme.com">www.cme.com</a>	Chicago Mercantile Exchange

## Notes

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- 1 It is also shortened to FX.
- 2 The figures for 2004 will be published by the Bank For International Settlements in its triannual survey in the autumn/winter of 2004. See [www.bis.org](http://www.bis.org)
- 3 The *Financial Times* takes a representative sample of rates from major dealers in London at 4 p.m.
- 4 If we ignore the marketmakers' bid/offer spread and transaction costs.
- 5 The CME and FINEX trades later months than those shown by the FT, but these, again, are usually at three-month intervals.
- 6 With some currency option contracts the exercise can take place any time up to the expiry date, rather than only on the expiry date.
- 7 Assuming, for the sake of simplicity, no diminution of asset value in dollar terms.

# Appendix I

## FUTURE VALUE OF £1 AT COMPOUND INTEREST

Interest rates (%)		Periods																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200	1.1300	1.1400	1.1500	1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200	1.1300	1.1400	1.1500
2	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881	1.2100	1.2321	1.2544	1.2769	1.2996	1.3225	2	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881	1.2100	1.2321	1.2544	1.2769	1.2996	1.3225
3	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950	1.3310	1.3676	1.4049	1.4429	1.4815	1.5209	3	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950	1.3310	1.3676	1.4049	1.4429	1.4815	1.5209
4	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3108	1.3605	1.4116	1.4641	1.5181	1.5735	1.6305	1.6890	1.7490	4	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3108	1.3605	1.4116	1.4641	1.5181	1.5735	1.6305	1.6890	1.7490
5	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4026	1.4693	1.5386	1.6105	1.6851	1.7623	1.8424	1.9254	2.0114	5	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4026	1.4693	1.5386	1.6105	1.6851	1.7623	1.8424	1.9254	2.0114
6	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5007	1.5869	1.6771	1.7716	1.8704	1.9738	2.0820	2.1950	2.3131	6	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5007	1.5869	1.6771	1.7716	1.8704	1.9738	2.0820	2.1950	2.3131
7	1.0721	1.1487	1.2299	1.3159	1.4071	1.5036	1.6058	1.7138	1.8280	1.9487	2.0762	2.2107	2.3526	2.5023	2.6600	7	1.0721	1.1487	1.2299	1.3159	1.4071	1.5036	1.6058	1.7138	1.8280	1.9487	2.0762	2.2107	2.3526	2.5023	2.6600
8	1.0829	1.1717	1.2668	1.3686	1.4775	1.5938	1.7182	1.8509	1.9926	2.1436	2.3045	2.4760	2.6584	2.8526	3.0590	8	1.0829	1.1717	1.2668	1.3686	1.4775	1.5938	1.7182	1.8509	1.9926	2.1436	2.3045	2.4760	2.6584	2.8526	3.0590
9	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8385	1.9990	2.1719	2.3579	2.5580	2.7731	3.0040	3.2519	3.5179	9	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8385	1.9990	2.1719	2.3579	2.5580	2.7731	3.0040	3.2519	3.5179
10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1597	2.3674	2.5937	2.8394	3.1058	3.3946	3.7072	4.0456	10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1597	2.3674	2.5937	2.8394	3.1058	3.3946	3.7072	4.0456
11	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804	2.8531	3.1518	3.4785	3.8359	4.2262	4.6524	11	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804	2.8531	3.1518	3.4785	3.8359	4.2262	4.6524
12	1.1268	1.2682	1.4258	1.6010	1.7959	2.0122	2.2522	2.5182	2.8127	3.1384	3.4985	3.8906	4.3345	4.8179	5.3503	12	1.1268	1.2682	1.4258	1.6010	1.7959	2.0122	2.2522	2.5182	2.8127	3.1384	3.4985	3.8906	4.3345	4.8179	5.3503
13	1.1381	1.2936	1.4685	1.6651	1.8856	2.1329	2.4098	2.7196	3.0658	3.4523	3.8833	4.3635	4.8980	5.4924	6.1528	13	1.1381	1.2936	1.4685	1.6651	1.8856	2.1329	2.4098	2.7196	3.0658	3.4523	3.8833	4.3635	4.8980	5.4924	6.1528
14	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.5785	2.9372	3.3417	3.7975	4.3104	4.8871	5.5348	6.2613	7.0757	14	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.5785	2.9372	3.3417	3.7975	4.3104	4.8871	5.5348	6.2613	7.0757
15	1.1610	1.3459	1.5580	1.8009	2.0789	2.3966	2.7590	3.1722	3.6425	4.1772	4.7846	5.4736	6.2543	7.1379	8.1371	15	1.1610	1.3459	1.5580	1.8009	2.0789	2.3966	2.7590	3.1722	3.6425	4.1772	4.7846	5.4736	6.2543	7.1379	8.1371
16	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.9703	4.5950	5.3109	6.1304	7.0673	8.1372	9.3576	16	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.9703	4.5950	5.3109	6.1304	7.0673	8.1372	9.3576
17	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.1588	3.7000	4.3276	5.0545	5.8951	6.8660	7.9861	9.2765	10.7613	17	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.1588	3.7000	4.3276	5.0545	5.8951	6.8660	7.9861	9.2765	10.7613
18	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.3799	3.9960	4.7171	5.5599	6.5436	7.6900	9.0243	10.5752	12.3755	18	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.3799	3.9960	4.7171	5.5599	6.5436	7.6900	9.0243	10.5752	12.3755
19	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6165	4.3157	5.1417	6.1159	7.2633	8.6128	10.1974	12.0557	14.2318	19	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6165	4.3157	5.1417	6.1159	7.2633	8.6128	10.1974	12.0557	14.2318
20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.6044	6.7275	8.0623	9.6463	11.5231	13.7435	16.3665	20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.6044	6.7275	8.0623	9.6463	11.5231	13.7435	16.3665
25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2919	5.4274	6.8485	8.6231	10.8347	13.5855	17.0001	21.2305	26.4619	32.9190	25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2919	5.4274	6.8485	8.6231	10.8347	13.5855	17.0001	21.2305	26.4619	32.9190
30	1.3600	1.8000	2.3000	2.8600	3.4800	4.1600	4.9000	5.7000	6.5600	7.4800	8.4600	9.5000	10.6000	11.7600	12.9900	30	1.3600	1.8000	2.3000	2.8600	3.4800	4.1600	4.9000	5.7000	6.5600	7.4800	8.4600	9.5000	10.6000	11.7600	12.9900
1	1.1600	1.1700	1.1800	1.1900	1.2000	1.2100	1.2200	1.2300	1.2400	1.2500	1.2600	1.2700	1.2800	1.2900	1.3000	1	1.1600	1.1700	1.1800	1.1900	1.2000	1.2100	1.2200	1.2300	1.2400	1.2500	1.2600	1.2700	1.2800	1.2900	1.3000
2	1.3456	1.3689	1.3924	1.4161	1.4400	1.4641	1.4884	1.5129	1.5376	1.5625	1.5876	1.6129	1.6384	1.6641	1.6900	2	1.3456	1.3689	1.3924	1.4161	1.4400	1.4641	1.4884	1.5129	1.5376	1.5625	1.5876	1.6129	1.6384	1.6641	1.6900
3	1.5609	1.6016	1.6430	1.6852	1.7280	1.7716	1.8158	1.8609	1.9066	1.9531	2.0004	2.0484	2.0972	2.1467	2.1970	3	1.5609	1.6016	1.6430	1.6852	1.7280	1.7716	1.8158	1.8609	1.9066	1.9531	2.0004	2.0484	2.0972	2.1467	2.1970
4	1.8106	1.8739	1.9388	2.0053	2.0736	2.1436	2.2153	2.2889	2.3642	2.4414	2.5205	2.6014	2.6844	2.7692	2.8561	4	1.8106	1.8739	1.9388	2.0053	2.0736	2.1436	2.2153	2.2889	2.3642	2.4414	2.5205	2.6014	2.6844	2.7692	2.8561
5	2.1003	2.1924	2.2878	2.3864	2.4883	2.5937	2.7027	2.8153	2.9316	3.0518	3.1758	3.3038	3.4360	3.5723	3.7129	5	2.1003	2.1924	2.2878	2.3864	2.4883	2.5937	2.7027	2.8153	2.9316	3.0518	3.1758	3.3038	3.4360	3.5723	3.7129
6	2.4364	2.5652	2.6996	2.8398	2.9860	3.1384	3.2973	3.4628	3.6352	3.8147	4.0015	4.1959	4.3980	4.6083	4.8268	6	2.4364	2.5652	2.6996	2.8398	2.9860	3.1384	3.2973	3.4628	3.6352	3.8147	4.0015	4.1959	4.3980	4.6083	4.8268
7	2.8262	3.0012	3.1855	3.3793	3.5832	3.7975	4.0227	4.2593	4.5077	4.7684	5.0419	5.3288	5.6295	5.9447	6.2749	7	2.8262	3.0012	3.1855	3.3793	3.5832	3.7975	4.0227	4.2593	4.5077	4.7684	5.0419	5.3288	5.6295	5.9447	6.2749
8	3.2784	3.5115	3.7589	4.0214	4.2998	4.5950	4.9077	5.2389	5.5895	5.9605	6.3528	6.7675	7.2058	7.6686	8.1573	8	3.2784	3.5115	3.7589	4.0214	4.2998	4.5950	4.9077	5.2389	5.5895	5.9605	6.3528	6.7675	7.2058	7.6686	8.1573
9	3.8030	4.1084	4.4355	4.7854	5.1598	5.5599	5.9874	6.4439	6.9310	7.4506	8.0045	8.5946	9.2234	9.8925	10.6045	9	3.8030	4.1084	4.4355	4.7854	5.1598	5.5599	5.9874	6.4439	6.9310	7.4506	8.0045	8.5946	9.2234	9.8925	10.6045
10	4.4114	4.8068	5.2338	5.6947	6.1917	6.7275	7.3046	7.9259	8.5944	9.3132	10.0857	10.9153	11.8059	12.7614	13.7858	10	4.4114	4.8068	5.2338	5.6947	6.1917	6.7275	7.3046	7.9259	8.5944	9.3132	10.0857	10.9153	11.8059	12.7614	13.7858
11	5.1173	5.6240	6.1759	6.7767	7.4301	8.1403	8.9117	9.7489	10.6571	11.6415	12.7080	13.8625	15.1116	16.4622	17.9216	11	5.1173	5.6240	6.1759	6.7767	7.4301	8.1403	8.9117	9.7489	10.6571	11.6415	12.7080	13.8625	15.1116	16.4622	17.9216
12	5.9360	6.5801	7.2876	8.0642	8.9161	9.8497	10.8722	11.9912	13.2148	14.5519	16.0120	17.6053	19.3428	21.2362	23.2981	12	5.9360	6.5801	7.2876	8.0642	8.9161	9.8497	10.8722	11.9912	13.2148	14.5519	16.0120	17.6053	19.3428	21.2362	23.2981
13	6.8858	7.6987	8.5994	9.5964	10.6993	11.9182	13.2641	14.7491	16.3863	18.																					



# Appendix III PRESENT VALUE OF AN ANNUITY OF £1 AT COMPOUND INTEREST

Interest rate (%)

Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696
2	1.9704	1.9416	1.9135	1.8851	1.8564	1.8274	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257
3	2.9410	2.8639	2.7877	2.7123	2.6376	2.5634	2.4897	2.4164	2.3434	2.2706	2.2000	2.1305	2.0620	1.9945	1.9280
4	3.8920	3.7635	3.6357	3.5085	3.3818	3.2556	3.1299	3.0046	2.8796	2.7550	2.6318	2.5090	2.3866	2.2646	2.1430
5	4.8534	4.6715	4.4900	4.3088	4.1279	3.9473	3.7670	3.5870	3.4072	3.2276	3.0483	2.8692	2.6903	2.5116	2.3332
6	5.7955	5.5584	5.3220	5.0861	4.8507	4.6157	4.3810	4.1466	3.9124	3.6784	3.4446	3.2110	2.9776	2.7443	2.5111
7	6.7282	6.4255	6.1240	5.8227	5.5215	5.2204	4.9193	4.6183	4.3173	4.0163	3.7153	3.4143	3.1133	2.8123	2.5113
8	7.6517	7.2955	6.9410	6.5881	6.2357	5.8836	5.5315	5.1794	4.8272	4.4750	4.1228	3.7706	3.4184	3.0662	2.7140
9	8.5660	8.1622	7.7603	7.3593	6.9591	6.5590	6.1588	5.7585	5.3581	4.9577	4.5573	4.1569	3.7564	3.3559	2.9554
10	9.4713	8.9226	8.4250	7.9282	7.4321	6.9360	6.4400	5.9439	5.4477	4.9515	4.4553	3.9591	3.4629	2.9666	2.4703
11	10.3686	9.7650	9.2083	8.6523	8.0964	7.5404	6.9844	6.4283	5.8722	5.3161	4.7600	4.2039	3.6477	3.0915	2.5353
12	11.2581	10.5984	9.9840	9.3656	8.7471	8.1286	7.5100	6.8914	6.2727	5.6540	5.0353	4.4166	3.7978	3.1790	2.5602
13	12.1403	11.4244	10.7490	10.0644	9.3797	8.6950	8.0102	7.3254	6.6406	5.9557	5.2708	4.5859	3.9010	3.2161	2.5311
14	13.0037	12.2304	11.5060	10.7731	10.0302	9.2872	8.5442	7.8011	7.0580	6.3149	5.5718	4.8287	4.0856	3.3424	2.5919
15	13.8461	13.0151	12.2304	11.4411	10.6471	9.8530	9.0589	8.2648	7.4707	6.6766	5.8824	5.0883	4.2941	3.4999	2.7056
16	14.7179	13.8277	13.0151	12.1661	11.3521	10.5580	9.7639	8.9697	8.1756	7.3814	6.5872	5.7930	4.9988	4.2046	3.4113
17	15.5623	14.2910	13.4684	12.6193	11.8052	11.0112	10.2171	9.4229	8.6287	7.8345	7.0403	6.2461	5.4519	4.6576	3.8670
18	16.3983	14.9920	14.1535	13.2835	12.4895	11.6856	10.8914	10.0971	9.3028	8.5085	7.7142	6.9199	6.1256	5.3312	4.5426
19	17.2260	15.8785	14.9238	14.0338	13.1339	12.3300	11.5361	10.7388	9.9444	9.1500	8.3556	7.5612	6.7668	5.9668	5.1481
20	18.0456	16.8514	15.7775	14.8775	13.9503	13.1503	12.3503	11.5503	10.7560	9.9616	9.1672	8.3728	7.5783	6.7838	5.9841
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8273	9.0730	8.3187	7.5643	6.8099	6.0555	5.3011
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.6658	7.9047	7.1435	6.3823	5.6210
35	29.4086	24.9986	21.4872	18.6646	16.3742	14.4982	12.9477	11.6546	10.5668	9.6440	8.8552	8.1755	7.4957	6.8159	6.1361
40	32.8347	27.5552	23.1148	19.7928	17.1741	15.0463	13.3317	11.9246	10.7574	9.7791	8.9411	8.2438	7.5640	6.8843	6.2054
45	36.0345	29.4902	24.5187	20.7200	17.7741	15.4558	13.6055	12.1084	10.8812	9.8628	9.0079	8.2825	7.6349	6.9543	6.2751
50	39.1361	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	9.0417	8.3045	7.6752	7.1327	6.6605

Periods	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	0.8621	0.8547	0.8475	0.8403	0.8333	0.8264	0.8197	0.8130	0.8065	0.8000	0.7937	0.7874	0.7812	0.7752	0.7692
2	1.6052	1.5852	1.5656	1.5465	1.5278	1.5095	1.4915	1.4740	1.4568	1.4400	1.4235	1.4074	1.3916	1.3761	1.3609
3	2.2459	2.2096	2.1743	2.1399	2.1065	2.0739	2.0422	2.0114	1.9813	1.9520	1.9234	1.8956	1.8684	1.8420	1.8161
4	2.7982	2.7432	2.6901	2.6386	2.5886	2.5400	2.4926	2.4463	2.4013	2.3574	2.3146	2.2728	2.2320	2.1921	2.1531
5	3.2743	3.1993	3.1272	3.0576	2.9906	2.9260	2.8636	2.8035	2.7454	2.6893	2.6351	2.5827	2.5320	2.4830	2.4356
6	3.6847	3.5892	3.4976	3.4088	3.3225	3.2389	3.1578	3.0792	3.0030	2.9291	2.8573	2.7875	2.7196	2.6535	2.5891
7	4.0386	3.9224	3.8115	3.7057	3.6046	3.5079	3.4153	3.3270	3.2423	3.1611	3.0833	3.0087	2.9370	2.8682	2.8021
8	4.3436	4.2072	4.0776	3.9544	3.8372	3.7256	3.6183	3.5159	3.4173	3.3229	3.2328	3.1464	3.0637	2.9846	2.9091
9	4.6065	4.4506	4.3030	4.1633	4.0310	3.9054	3.7863	3.6731	3.5655	3.4631	3.3657	3.2728	3.1842	3.0997	3.0190
10	4.8332	4.6586	4.4941	4.3389	4.1925	4.0541	3.9232	3.7993	3.6819	3.5705	3.4648	3.3648	3.2689	3.1771	3.0895
11	5.0286	4.8384	4.6560	4.4822	4.3271	4.1817	4.0450	3.9168	3.7957	3.6824	3.5759	3.4759	3.3808	3.2898	3.2021
12	5.1971	4.9884	4.7932	4.6105	4.4452	4.2890	4.1417	3.9924	3.8511	3.7168	3.5893	3.4683	3.3531	3.2438	3.1384
13	5.3423	5.1183	4.9118	4.7205	4.5472	4.3834	4.2281	4.0813	3.9420	3.8091	3.6824	3.5619	3.4467	3.3364	3.2300
14	5.4675	5.2293	5.0166	4.8205	4.6416	4.4717	4.3104	4.1575	4.0129	3.8764	3.7471	3.6240	3.5061	3.3932	3.2847
15	5.5765	5.3252	5.0953	4.8959	4.7126	4.5460	4.3874	4.2367	4.0938	3.9583	3.8291	3.7051	3.5862	3.4723	3.3628
16	5.6687	5.4053	5.1614	4.9586	4.7716	4.6000	4.4361	4.2801	4.1319	3.9904	3.8553	3.7264	3.6024	3.4835	3.3686
17	5.7446	5.4749	5.2250	5.0186	4.8272	4.6517	4.4840	4.3240	4.1717	4.0270	3.8897	3.7587	3.6336	3.5135	3.3984
18	5.8076	5.5319	5.2770	5.0670	4.8716	4.6911	4.5193	4.3553	4.1991	4.0517	3.9117	3.7780	3.6518	3.5316	3.4164
19	5.8588	5.5775	5.3176	5.1031	4.9136	4.7381	4.5613	4.3924	4.2313	4.0770	3.9300	3.7891	3.6551	3.5298	3.4045
20	5.9071	5.6204	5.3545	5.1353	4.9416	4.7601	4.5782	4.4131	4.2540	4.1017	3.9560	3.8161	3.6819	3.5564	3.4310
25	6.0971	5.7652	5.4850	5.2593	5.0616	4.8761	4.6956	4.5261	4.3626	4.2051	4.0536	3.9071	3.7655	3.6288	3.4921
30	6.1772	5.8092	5.5168	5.2861	5.0844	4.8959	4.7164	4.5429	4.3794	4.2169	4.0654	3.9139	3.7623	3.6107	3.4590
35	6.2153	5.8082	5.4936	5.2582	5.0527	4.8612	4.6767	4.4971	4.3274	4.1627	4.0030	3.8483	3.6945	3.5407	3.3869
40	6.2347	5.8713	5.5392	5.2886	5.0781	4.8826	4.6930	4.5083	4.3335	4.1637	4.0000	3.8413	3.6875	3.5337	3.3799
45	6.2421	5.8773	5.5333	5.2781	5.0636	4.8730	4.6803	4.4915	4.3117	4.1369	3.9671	3.8023	3.6484	3.4945	3.3406
50	6.2463	5.8801	5.5341	5.2749	5.0554	4.8617	4.6660	4.4732	4.2874	4.1116	3.9417	3.7768	3.6229	3.4690	3.3151

# Appendix IV

## FUTURE VALUE OF AN ANNUITY OF £1 AT COMPOUND INTEREST

Periods	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	25	30	35	40	45	50	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0200	2.0300	2.0400	2.0500	2.0600	2.0700	2.0800	2.0900	2.1000	2.1200	2.1400	2.1600	2.1800	2.2000	2.2500	2.3000	2.3500	2.4000	2.4500	2.5000	2.5500
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2149	3.2464	3.2781	3.3100	3.3744	3.4396	3.5056	3.5724	3.6400	3.8125	3.9900	4.1725	4.3600	4.5525	4.7500	4.9500
4	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.4399	4.5061	4.5731	4.6410	4.7793	4.9211	5.0665	5.2154	5.3680	5.7646	6.1870	6.6329	7.1040	7.6011	8.1250	8.6785
5	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.7507	5.8666	5.9847	6.1051	6.3528	6.6101	6.8771	7.1542	7.4416	8.2070	9.0431	9.9544	10.9456	12.0216	13.1875	14.4463
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.1533	7.3359	7.5233	7.7156	8.1152	8.5355	8.9775	9.4420	9.9299	11.2588	12.7560	14.4834	16.3238	18.2813	20.3613	22.5785
7	7.2135	7.4343	7.6625	7.8983	8.1420	8.3938	8.6540	8.9228	9.2004	9.4872	10.0890	10.7305	11.4139	12.1415	12.9159	15.0735	17.5828	20.4919	23.8534	27.7255	32.1719	37.2498
8	8.2857	8.5830	8.8923	9.2142	9.5491	9.8975	10.2598	10.6366	11.0285	11.4359	12.2997	13.2328	14.2401	15.3270	16.4991	19.8419	23.8577	28.6640	34.3947	41.2019	49.2578	58.6278
9	9.3685	9.7546	10.1591	10.5828	11.0266	11.4913	11.9780	12.4876	13.0210	13.5795	14.7757	16.0853	17.5185	19.0857	20.7989	25.8023	32.0150	39.6964	49.1526	60.7428	74.886	92.0771
10	10.4622	10.9497	11.4639	12.0061	12.5779	13.1808	13.8164	14.4866	15.1929	15.9374	17.5487	19.3373	21.3215	23.5213	25.9587	33.2529	42.6195	54.5902	69.8137	89.0771	113.330	143.995
11	11.5668	12.1687	12.8078	13.4864	14.2068	14.9616	15.7536	16.5845	17.4563	18.3707	20.6546	23.0445	25.7329	28.7551	32.1504	42.5661	56.4053	74.6967	98.7391	130.162	170.995	224.995
12	12.6825	13.4121	14.1920	15.0258	15.9171	16.8699	17.8885	18.9771	20.1407	21.3843	24.1331	27.2707	30.8502	34.9311	39.5805	54.2077	74.3270	101.841	139.235	189.735	257.493	347.935
13	13.8093	14.6803	15.6178	16.6268	17.7130	18.8821	20.1406	21.4953	22.9534	24.5227	28.0291	32.0887	36.7862	42.2187	48.4966	68.7596	97.6250	138.485	195.929	276.115	387.239	534.935
14	14.9474	15.9739	17.0663	18.2919	19.5986	21.0151	22.5505	24.2149	26.0192	27.9750	32.3926	37.5811	43.6720	50.8180	59.1959	86.9495	127.913	187.954	275.300	401.367	581.859	814.935
15	16.0969	17.2934	18.5989	20.0236	21.5786	23.2760	25.1290	27.1521	29.3609	31.7725	37.2797	43.8424	51.6595	60.9653	72.0351	109.687	167.286	254.738	386.420	582.982	873.788	1211.68
16	17.2579	18.6393	20.1569	21.8245	23.6575	25.6725	27.8881	30.3243	33.0034	35.9497	42.7533	50.9804	60.9250	72.9390	87.4421	138.109	218.472	344.897	541.988	846.324	1311.68	1911.68
17	18.4304	20.0121	21.7616	23.6975	25.8404	28.2129	30.8402	33.7502	36.9737	40.5447	48.8837	59.1176	71.6730	87.0680	105.931	173.636	285.014	466.611	759.784	1228.17	1968.52	2811.68
18	19.6147	21.4123	23.4144	25.6454	28.1324	30.9057	33.9990	37.4502	41.3013	45.5992	55.7497	68.3941	84.1407	103.740	128.117	218.045	371.518	630.925	1064.70	1781.85	2953.78	4211.68
19	20.8109	22.8406	25.1169	27.6712	30.5390	33.7600	37.3790	41.4463	46.0185	51.1591	63.4397	78.9692	98.6032	123.414	154.740	273.556	483.973	852.748	1491.58	2584.68	4431.68	6411.68
20	22.0190	24.2974	26.89704	29.7781	33.0660	36.7856	40.9955	45.7620	51.1601	57.2750	72.0524	91.0249	113.380	146.628	186.688	342.945	630.165	1152.21	2089.21	3748.78	6648.51	9611.68
25	28.2432	32.0303	36.4593	41.6459	47.7271	54.8645	63.2490	73.1059	84.7009	93.3471	133.334	181.871	249.214	42.603	471.981	1054.79	2348.80	5176.50	11247.1990	24040.7	50500.3	88111.68
30	34.7849	40.5681	47.5754	56.0849	66.4388	79.0582	94.4608	113.83	136.308	164.494	241.333	356.787	530.312	790.948	1181.88	3227.17	8729.99	23221.6	60501.1	154107	383.500	88111.68
35	41.6603	49.9945	60.4621	73.6522	90.3203	111.435	138.237	173.317	215.711	271.022	431.663	93.573	1120.71	1816.65	2948.34	9856.76	32422.9	104136	325400	987794	2912217	88111.68
40	48.8864	60.4020	75.4013	95.0255	120.800	154.762	199.635	259.057	337.882	442.593	767.091	1342.03	2360.76	4163.21	7343.86	30088.7	120393	466960	1750092	6331512	22114663	88111.68
45	56.4811	71.8927	92.7199	121.029	159.700	212.744	285.749	368.504	525.859	718.905	1358.23	2590.56	4965.27	9531.58	18281.3	91831.5	447019	2093876	9412424	40583319	167933233	88111.68
50	64.4632	84.5794	112.797	152.667	208.348	290.336	406.529	573.770	815.084	1163.91	2400.02	4994.52	10435.6	21813.1	45497.2	280256	1659761	9389020	50622288	260128295	1275242998	88111.68

## GLOSSARY

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**Absolute advantage** A firm, person, organization or country has an absolute advantage if it can obtain a benefit at a lower cost than other firms, people, organizations or countries. For example, Costa Rica has an absolute advantage in the growing of bananas *vis-à-vis* Europe.

**Acceptance credit (bank bill)** An institution (e.g. bank) commits itself to the payment of a sum of money in the future as stated in the acceptance credit document. The borrower is given this document in return for a promise to pay a sum on the maturity date to the institution. The acceptance credit can be sold in the discount market to obtain funds for the borrower.

**Accounting rate of return** A measure of project SBU or firm profitability. Profit divided by assets devoted to the project (or entire business).

**Accounting standards** A set of formal rules and conventions set by the accounting profession to calculate accounting numbers.

**Acid test** *See* Quick ratio

**Additivity** Able to add up.

**Administration** An administrator takes over the running of a distressed company to help it survive and avoid liquidation.

**Affirmative covenants** Loan agreement conditions, e.g. a statement that a bond will pay regular dividends.

**Ageing schedule** The total debtor figure is broken down to show how long invoices have been outstanding (remained unpaid).

**Agency** Acting for or in the place of another with his/her/their authority.

**Agency costs** Costs of preventing agents (e.g. managers) pursuing their own interests at the expense of their principals (e.g. shareholders). Examples include contracting costs and costs of monitoring. In addition there is the agency cost of the loss of wealth caused by the extent to which prevention measures have not worked and managers continue to pursue non-shareholder wealth goals.

**Agent** A person who acts for or in the place of another with that other person's authority.

**Aggressive shares** Shares having a beta value greater than 1.

**AGM** *See* Annual general meeting.

**Allocation of capital** The mechanism for selecting competing investment projects leading to the production of a mixture of goods and services by a society. This can be influenced by the forces of supply and demand; and by central authority direction.

**Allocational efficiency of markets** Efficiency in the process of allocating society's scarce resources between competing real investments.

- Allotment** In a new issue of shares, if more shares are demanded at the price than are available, they may be apportioned (allotted) between the applicants.
- Alternative Investment Market (AIM)** The lightly regulated market operated by the London Stock Exchange, focussed particularly on smaller, less well-established companies.
- All-paper deal** When a bidder offers to buy shares in a target the payment is entirely in the form of shares in the bidder.
- American Depositary Receipts (ADRs)** Depositary receipts issued in the USA.
- AMEX** The American Stock Exchange. Trades equities, options and exchange traded funds.
- American-style option** An option which can be exercised by the purchaser at any time up to the expiry date.
- Amortization** The repayment of a debt by a series of instalments.
- Amortization of assets** The reduction in book value of an intangible asset such as goodwill.
- Analyst** A researcher of companies' prospects and predictor of their share price performance.
- Angel** *See* Business angel.
- Annual equivalent annuity (AEA)** A regular annual amount which is equivalent, in present value terms, to another set of cash flows.
- Annual general meeting (AGM)** A limited company must hold in each calendar year an annual general meeting. It is an opportunity for shareholders to meet and talk with each other and with those who run the company on their behalf. The managers give an account of their stewardship. All shareholders are entitled to attend and vote.
- Annual percentage rate (APR)** The true annual interest rate charged by a lender. It takes full account of the timing of payments of interest and principal.
- Annual results** Annual company accounts. This term is often used for the preliminary results.
- Annuity** An even stream of payments (same amount each time) over a given period of time.
- Arbitrage** The act of exploiting price differences on the same instrument or similar securities by simultaneously selling the overpriced security and buying the underpriced security.
- Arbitrage pricing theory (APT)** A type of multi-factor model which relates return on securities to various non-diversifiable risk factors. The expected return on any risky security is a linear combination of these factors.
- Arithmetic mean** The average of a population equals the sum of the observations divided by the number of observation.
- Articles of Association** Internal rules governing a company. Can be unique to company.
- Asset** In the financial market an asset is anything that can be traded as a security, e.g. share, option, commodity, bond.
- Asset allocation** An investment methodology which specifies the proportion of funds to be invested in different asset classes, e.g. property, shares, bonds.

**Asset-backed securities** *See* Securitization.

**Asset backing** The value of the assets held in the business – often measured on a per share basis.

**Asset class** Assets types, e.g. bonds, shares.

**Asset liquidity** The extent to which assets can be converted to cash quickly and at a low transaction cost.

**Asset lock-up** In a hostile takeover situation, the target sells to a friendly firm those parts of the business most attractive to the bidder.

**Asset transformers** Intermediaries who, by creating a completely new security – the intermediate security – mobilize savings and encourage investment. The primary security is issued by the ultimate borrower to the intermediary, who offers intermediate securities to the primary investors.

**Associated company** A company in which an investor (usually a holding company) holds a participating interest and exercises significant influence over the entity. ‘Interest’ includes shares, options and convertible securities. ‘Participating’ means the interest is held on a long-term basis and there is significant influence. Usually a 20 percent or more holding of the shares is presumed to be participating.

**Asymmetric information** One party in a negotiation or relationship is not in the same position as other parties, being ignorant of, or unable to observe, some information which is essential to the contracting and decision-making process.

**At-the-money option** The current underlying price is equal to the option exercise price.

**Audit committee** A committee of company directors responsible for validating their company’s financial figures, e.g. by appointing effective external auditors.

**Auditor** Auditors determine whether the company’s financial statements are misleading and whether the accounts shows a true and fair view.

**Authorized share capital** The maximum amount of share capital that a company can issue. The limit can be changed by a shareholder vote.

**Average collection period (ACP)** The average number of days it takes to collect debts from customers. The total debtors outstanding divided by the average daily sales.

**Back office** That part of a financial institution which deals with the settlement of contracts, accounting and management information processes.

**Bad debts** Debts that are unlikely to be paid.

**Balance of payments** A record of the payment for goods and services obtained by a country and other transfers of currency from abroad and the receipts for goods and services sold and other transfers of currency abroad. The balance on the current account (visible trade and invisible trade) is the difference between national income and national expenditure in the period. The capital account is made up of such items as the inward and outward flow of money for investment and international grants and loans.

**Balance sheet** Provides a picture of what a company owned and is owed on a particular day in the past. It summarizes assets and liabilities.



**Balloon repayment on a loan** The majority of the repayment of a loan is made at or near the maturity date, with the final payment substantially larger than the earlier payments.

**Ballot** In a new issue of shares when a company floats on a stock exchange if the demand is greater than supply, the shares are allocated to some applicants but not others, selected at random.

**Bancassurance** Companies offering both banking and insurance.

**Bank covenants** *See* covenants.

**Bank for International Settlements (BIS)** Controlled by central banks, the BIS was established to assist international financial co-ordination. It promotes international monetary co-ordination, provides research and statistical data, co-ordination and trusteeship for intergovernmental loans, and acts as a central bank for national central banks, accepting deposits and making loans.

**Bank of England** The central bank of the United Kingdom, responsible for monetary policy. It oversees the affairs of other financial institutions, issues banknotes and coins, manages the national debt and exchange rate, and is lender of last resort.

**Bank of England index** Shows the extent to which a currency has strengthened or weakened against sterling since 1990.

**Barriers to entry** The obstacles that a company entering a market for the first time has to overcome to do well in that market.

**Base case strategy** A continuation of current strategy.

**Base rate** The reference rate of interest that forms the basis for interest rates on bank loans, overdrafts and deposit rates.

**Basic (FRS 3) earnings per share** Includes deductions from profit of one-off exceptional items and goodwill amortization.

**Basis point** One-hundredth of 1 percent, usually applied to interest rates.

**Bear** An investor who takes the view that prices are likely to fall.

**Bear fund** Designed to do well when shares are falling in price.

**Bearer bond** The ownership of a bond is not recorded on a register. Possession of the bond is sufficient to receive interest, etc.

**Bells and whistles** Additional features placed on derivatives or securities such as bonds that are designed to attract investors.

**Benchmark index** An index of shares or other securities that sets a standard for fund manager performance, e.g. a fund manager controlling a portfolio of pharmaceutical shares would measure performance against a pharmaceutical index. This is calculated by an independent person to be representative of the sector.

**Benefit-cost ratio** A measure of present value per £ invested. Benefit-cost ratio = Net present value divided by Initial outlay.

**Beta** This measures the systematic risk of a financial security. In the capital asset pricing model it is a measure of the sensitivity to market movements of a financial securities return, as measured by the covariance between returns on the asset and returns on the market portfolio divided by the variance of the market portfolio. In practice a proxy (e.g. FTSE 100 index) is used for the market portfolio.

- Bid premium** The additional amount an acquirer has to offer above the pre-bid share price to succeed in a takeover offer.
- Bid price** The price at which a market maker will buy shares or a dealer in other markets will buy a security or commodity.
- Bid-offer spread** The difference between the market-maker's buy and sell prices.
- Bill of exchange** A document which sets out a commitment to pay a sum of money at a specified point in time, e.g. an importer commits itself to paying a supplier. Bills of exchange may be discounted – sold before maturity for less than face value.
- BIMBO** A buy-in management buyout. A combination of a management buyout and a buy-in. Outside managers join forces with existing managers to take over a company, subsidiary or unit.
- Black Monday** 19 October 1987, the date of a large fall in stock market prices.
- Black Wednesday** 16 September 1992, a day of severe currency turbulence when sterling and the Italian lira devalued significantly and were forced to leave the exchange rate mechanism.
- Blue chip** The shares with the highest status as investments. Regarded as safest (often mistakenly).
- Board of Directors** People elected by shareholders to run a company.
- Bond** A debt obligation with a long-term maturity, usually issued by firms and governments.
- Bond covenants** *See* Covenants
- Bonus issue** *See* Scrip issue.
- Book-building** A book runner invites major institutional investors to suggest how many shares they would be interested in purchasing and at what price in a new issue or secondary issue of shares. This helps to establish the price and allocate shares.
- Book-to-market equity ratio** The ratio of a firm's balance sheet value to the total market value of its shares.
- Book value** Balance sheet value. Can be expressed on a per share basis.
- Bootstrapping game** *See* Price-earnings ratio game.
- Borrowing capacity** Limits to total borrowing levels imposed by lenders, often determined by available collateral.
- Bottom line** Profit attributable to the shareholders.
- Bought deal** An investment bank buys an entire security issue (e.g. shares) from a client corporation raising finance. The investment bank usually intends to then sell it out to institutional clients within hours.
- Bourse** Alternative name for a Stock Exchange. Used particularly in continental Europe.
- Break-even analysis** Analyzing the level of sales at which a project, division or business produced a zero profit (accounting emphasis).
- Break-even NPV** The extent to which a single variable can change before the NPV of a proposed project switches from positive to negative (or vice versa).

**Broker** Assists in the buying and selling of financial securities by acting as a 'go-between', helping to reduce search and information costs.

**Bubble** An explosive upward movement in financial security prices not based on fundamentally rational factors, followed by a crash.

**Budget (national)** Sets out government expenditure and revenue for the financial year. In the UK it is presented by the Chancellor of the Exchequer to the British Parliament.

**Buffer stock** Stock held to reduce the negative effects (stock-out costs) of an unusually large usage of stock.

**Building society** A UK financial institution, the primary role of which is the provision of mortgages. Building societies are non-profit-making mutual organizations. Funding is mostly through small deposits by individuals.

**Bulge bracket** A leading investment bank.

**Bull** An investor taking the view that prices will rise.

**Bulldog** A foreign bond issued in the UK.

**Bullet bond** A bond where all the principal on a loan is repaid at maturity.

**Bulletin board** A computer-based site for infrequently traded shares on which investors (via brokers) can display their unfilled orders in the hope of finding a match.

**Business angels** Wealthy individuals prepared to invest between £10,000 and £250,000 in a start-up, early-stage or developing firm. They often have managerial and/or technical experience to offer the management team as well as equity and debt finance. Medium- to long-term investment in high-risk situation.

**Business risk** The risk associated with the underlying operations of a business. The variability of the firm's operating income, before interest income: this dispersion is caused purely by business-related factors and not by the debt burden.

**BVCA** British Venture Capital Association.

**Cadbury report** The Committee on the Financial Aspects of Corporate Governance chaired by Sir Adrian Cadbury made recommendations on the role of directors and auditors, published in 1992.

**Call option** This gives the purchaser the right, but not the obligation, to buy a fixed quantity of a commodity, financial instrument or some other underlying asset at a given price, at or before a specified date.

**Called-up (issued) share capital** The total value of shares sold by a company when expressed at par or nominal value.

**Cap** An interest rate cap is a contract that effectively gives the purchaser the right to set a maximum level for interest rates payable. Compensation is paid to the purchaser of a cap if interest rates rise above an agreed level.

**Capital asset pricing model (CAPM)** An asset (e.g. share) pricing theory which assumes that financial assets, in equilibrium, will be priced to produce rates of return which compensate investors for systematic risk as measured by the covariance of the assets' return with the market portfolio return (i.e. beta).

- Capital budgeting** The process of selecting long-term capital investments.
- Capital expenditure** The purchase of long-lived (more than one year) assets (that is, fixed assets).
- Capital gearing** The extent to which the firm's total capital is in the form of debt.
- Capital lease** *See* Leasing.
- Capital market** Where those raising finance can do so by selling financial investments to investors, e.g. bond, shares.
- Capital rationing** When funds are not available to finance all wealth-enhancing (positive NPV) projects.
- Capital structure** The proportion of the firm's capital which is equity or debt.
- Capitalization** (1) An item of expenditure is taken on to the balance sheet and capitalized as an asset rather than written off against profits. (2) Short for market capitalization.
- Capitalization factor** A discount rate.
- Capitalization issue** *See* Scrip issue.
- Capitalization rate** Required rate of return for the class of risk.
- Capped bonds** The floating interest rate charged cannot rise above a specified level.
- Cartel** A group of firms entering into an agreement to set mutually acceptable prices for their products.
- Cash-conversion cycle** The stock-conversion period plus the debtor-conversion period minus the credit period granted by suppliers. It focusses on the length of time between the company's outlay on inputs and the receipt of money from the sale of goods.
- Cash cow** A profitable company with low growth and stable market conditions with low investment needs. The company's competitive strength enables it to produce surplus cash.
- Cash settlement** In the derivative market some contracts are physically settled at expiry date (e.g. pork bellies are delivered in return for cash under the derivative contract). However, many derivatives are not physically delivered, rather a cash difference representing a gain or loss on the closed derivative position passes hands.
- CBOT** Chicago Board of Trade.
- Central bank** A banker's bank and lender of last resort, which controls the credit system of an economy, e.g. controls note issue, acts as the government's bank, controls interest rates and regulates the country's banking system.
- Certificate of deposit (CD)** A deposit is made at a bank. A certificate confirming that a deposit has been made is given in return to the lender. This is normally a bearer security. The CD can then be sold in the secondary market whenever a firm needs cash.
- CHAPS (Clearing House Automated Payment System)** The UK same-day interbank clearing system for sterling payments.
- Characteristic line** The line that best relates the return on a share to the return on a broad market index.
- Chicago Board of Trade (CBOT)** The futures and options exchange in Chicago, USA – the world's oldest (established 1848).

**Chicago Board Options Exchange (CBOE)** The largest options exchange in the world, trading options on shares, indices and interest rates.

**Chicago Mercantile Exchange (CME)** An exchange which trades a wide range of currency futures and options, interest rate futures and options, commodity futures and options, and share index futures and options.

**Chief executive's review (operational review)** A comment, contained in a company's annual report and accounts, on performance, strategy and managerial intentions.

**CHIPS (Clearing House Interbank Payment System)** The US system for US dollar payment between banks.

**City Code on Takeovers and Mergers** Provides the main governing rules for companies engaged in merger activity. Self-regulated and administered by the Takeover Panel.

**City of London** A collective term for the financial institutions located in the financial district to the east of St Paul's Cathedral in London (also called the Square Mile). However, the term is also used to refer to all financial institutions, wherever they are located.

**Claw back** Existing shareholders often have the right to reclaim shares sold under a placing as though they were entitled to them under a rights issue.

**Clean price** On a bond the prices are general quoted 'clean' that is without taking account of the accrued interest since the last coupon payment.

**Clearing bank** Member of the London Bankers' Clearing House, which clears checks, settling indebtedness between two parties.

**Clearing house** An institution which settles mutual indebtedness between a number of individuals or organizations. The clearing house may also act as a counterparty.

**Clientele effects** In dividend theory the level of dividend may be influenced by shareholders preferring a dividend pattern which matches their consumption pattern or tax position.

**Closed-end funds** Collective investment vehicles (e.g. investment trusts) that do not create or redeem shares on a daily basis in response to increases and decreases in demand. They have a fixed number of shares for lengthy periods.

**Closing out a futures position** The act of taking a second action in the futures market (say selling the future) which is exactly opposite to the first action (say buying the future). Also called reversing the trade.

**Coefficient of determination, R-squared** For single linear regression this is the proportion of variation in the dependant variable that is related to the variation in the independent variable.

**Collateral** Property pledged by a borrower to protect the interests of the lender.

**Commercial bill (bank bill or trade bill)** A document expressing the commitment of a borrowing firm to repay a short-term debt at a fixed date in the future.

**Commercial paper (CP)** An unsecured note promising the holder (lender) a sum of money to be paid in a few days – average maturity of 40 days. If they are denominated in foreign currency and placed outside of the jurisdiction of the authorities of that currency then the notes are euro-commercial paper.

- Commitment fee** A fee payable in return for a commitment by a bank to lend money.
- Commodity product** Undifferentiated compared with competitor offerings in any customer-important way by factors such as performance, appearance, service support, etc.
- Common stock** The term used in the USA to describe ordinary shares in a company.
- Companies Acts** The series of laws enacted by Parliament governing the establishment and conduct of incorporated business enterprises. The Companies Act 1985 consolidated the Acts that preceded it.
- Companies House** The place where records are kept of every UK company. These accounts, etc. are then made available to the general public.
- Company registrar** *See* Registrar.
- Comparative advantage** A firm or a country has a comparative advantage in the production of good X if the opportunity cost of producing a unit of X, in terms of other goods forgone, is lower, in that country compared with another country, or in that firm compared with another firm.
- Competition Commission** The Commission may obtain any information needed to investigate possible monopoly anti-competitive situations referred to it. It may then block the anti-competitive action.
- Competitive advantage (edge)** The possession of extraordinary resources that allow a firm to rise above the others in its industry to generate exceptional long run rates of return on capital employed.
- Competitive floor** Where competition between companies in an industry is so strong that shareholders receive a rate of return that only just induces them to put money into the firm and hold it there.
- Competitive position** The competitive strength of the firm *vis-à-vis* rivals in a product market.
- Complementary product** One that is generally bought alongside the product in question.
- Compound interest** Interest is paid on the sum which accumulates, whether or not that sum comes from principal or from interest received.
- Compound return** The income received on an investment is reinvested in the investment and future returns are gained on both the original capital and the plowed-back income.
- Concert party** A group of investors, acting together or under the control of one person, which buys shares in a company.
- Conflict of preferences** There is a conflict of preferences between the primary investors wanting low-cost liquidity and low risk on invested funds, and the ultimate borrowers wanting long-term risk-bearing capital.
- Conglomerate bank** A bank with a wide range of activities, products and markets.
- Conglomerate merger** The combining of two firms which operate in unrelated business areas.
- Consideration** The price paid for something.
- Consolidated accounts** All the income, costs, assets and all the liabilities of all group companies, whether wholly or partially owned, are brought together in the consolidated accounts.

- Consolidation of shares** The number of shares issued by a company is reduced and the nominal value of each remaining share rises.
- Consumer price index (CPI)** The main US measure of general inflation.
- Continuing obligations** Standards of behavior and actions required of firm's listed on the London Stock Exchange, enforced by the United Kingdom Listing Authority.
- Contractual theory** Views the firm as a network of contracts, actual and implicit, which specify the roles to be played by various participants. Most participants bargain for low risk and a satisfactory return. Shareholders accept high risk in anticipation of any surplus returns after all other parties have been satisfied.
- Controlling shareholder** One with 30 percent or more of the voting capital, or any shareholder able to control the composition of the board of directors.
- Conventional cash flows** Where an outflow is followed by a series of inflows, or a cash inflow is followed by a series of cash outflows.
- Convergence** The coming together of the futures price and the underlying share price in the final trading day of a futures contract.
- Conversion premium** The difference between the current share price and the conversion price, expressed as a percentage of the current share price for convertible bonds.
- Conversion price** The share price at which convertible bonds may be converted.
- Conversion ratio** The nominal (par) value of a convertible bond divided by the conversion price. The number of shares available per bond.
- Conversion value** The value of a convertible bond if it were converted into ordinary shares at the current share price.
- Convertible bonds** Bonds which carry a rate of interest and give the owner the right to exchange the bonds at some stage in the future into ordinary shares according to a prearranged formula.
- Convertible loan stock** Same definition as convertible bond.
- Convertible preferred stock** A preferred share that can be changed into another type of security, e.g. an ordinary share.
- Coredeal** An international exchange for international debt-related securities, owned by the International Securities Markets Association (ISMA).
- Corporate bond** A bond issued by a company.
- Corporate broker** Stockbrokers that act on behalf of companies quoted on an exchange. For example, providing advice on market conditions or representing the company to the market. Corporate brokers are knowledgeable about the share and other financial markets. Advise companies on fund raising (e.g. new issues). Try to generate interest among investors for the company's securities. Stand prepared to buy and sell companies' shares.
- Corporate finance department of investment banks** The department assisting firms in raising funds (e.g. rights issues, bond issues) and managing their finances.
- Corporate governance** The system of management and control of the corporation, e.g. the number and power of independent non-executive directors.
- Corporate raider** An organization that makes hostile takeover approaches for quoted companies.

- Corporate value** The present value of cash flows within the planning horizon plus the present value of cash flows after the planning horizon. Plus the value of saleable assets not required for cash-flow generation.
- Corporate venturing** Large companies fostering the development of smaller enterprises through, say, joint capital venture or equity capital provision.
- Corporation tax** A tax levied on the profits of companies.
- Correlation coefficient** A measure of the extent to which two variables show a relationship, expressed on a scale of  $-1$  to  $+1$ .
- Cost leadership strategy** Standard no-frills product. Emphasis on scale economics and other cost advantages.
- Cost of capital** The rates of return that a company has to offer finance providers to induce them to buy and hold a financial security.
- Counterparty** The buyer for a seller or the seller for a buyer.
- Counterparty risk** The risk that a counterparty to a contract defaults and does not fulfil obligations.
- Coupons** An attachment to a bond or loan notes document which may be separated and serve as evidence of entitlement to interest. Nowadays it refers to the interest itself.
- Covariance** The extent to which two variables move together.
- Covenant** A solemn agreement.
- Covered call option writing** Writing a call option on an underlying when the writer owns at least the number of underlying securities included in the option.
- Covered warrants** The same as warrants except that financial institutions issue them selling the right to buy or sell shares in industrial and commercial companies.
- Creative accounting** The drawing up of accounts which obey the letter of the law and accounting body rules but which involve the manipulation of accounts to show the most favorable profit and balance sheet.
- Credit period** The average length of time between the purchase of inputs and the payment for them. Equal to the average level of creditors divided by the purchases on credit per day.
- Credit rating** An estimate of the quality of a debt from the lender viewpoint in terms of the likelihood of interest and capital not being paid and of the extent to which the lender is protected in the event of default. Credit rating agencies are paid fees by companies, governments, etc. wishing to attract lenders.
- Credit risk** The risk that a counterparty to a financial transaction will fail to fulfil their obligation.
- Credit union** A non-profit organization accepting deposits and making loans, operated as a co-operative.
- Creditor** One to whom a debt is owed.
- Crest** An electronic means of settlement and registration of shares following a sale on the London Stock Exchange.
- Crown jewels defense** In a hostile merger situation, the target sells off the most attractive parts of the business.



- Cum-dividend** When an investor buys a government **bond** when it is still designated cum-dividend he/she is entitled to the accrued interest since the last coupon was paid. A **share designated cum-dividend** indicates that the buyer will be entitled to a dividend recently announced by the company.
- Cum-rights** Shares bought on the stock market prior to the ex-rights day are designated cum-rights and carry to the new owner the right to subscribe for the new shares in the rights issue.
- Cumulative** If a payment (interest or dividend) on a bond or share is missed in one period those securities are given priority when the next payment is made. These arrears must be cleared up before shareholders received dividends.
- Currency swap** *See* Swap.
- Current assets** Cash and other assets that can be rapidly turned into cash. Includes stocks of raw materials, partially finished goods and finished goods, debtors and investments expected to be sold within one year.
- Current asset value (net)** Current assets (cash, accounts receivable, inventory) minus current liabilities (also called working capital).
- Current liabilities** Amounts owed that the company expects to have to pay within the next year.
- Current ratio** The ratio of current liabilities to the current assets of a business.
- Cyclical companies (shares)** Those companies in which profits are particularly sensitive to the growth level in the economy, which may be cyclical.
- Cyclical industries** Those industries in which profits are particularly sensitive to the growth level in the economy, which may be cyclical.
- Daily Official List (DOL)** The daily record setting out the prices of all trades in securities conducted on the London Stock Exchange.
- Darling** A stock market darling is a company which receives a lot of attention and is regarded as very attractive.
- Dawn raid** An acquirer acts with such speed in buying the shares of the target company that the raider achieves the objective of a substantial stake in the target before its management has time to react.
- Debentures** Bonds issued with redemption dates a number of years into the future. Usually secured against specific assets (mortgage debentures) or through a floating charge on the firm's assets.
- Debt capital** Capital raised with (usually) a fixed obligation in terms of interest and principal payments.
- Debtor conversion period** The average number of days to convert customer debts into cash. Equal to the average value of debtors divided by the average value of sales per day.
- Debtors** Those who owe a debt.
- Declining (reducing) balance method of depreciation** The amount an asset is depreciated declines from one year to the next as it is determined by a constant percentage of the assets' depreciated value at the start of each year.

- Deep discounted bonds** Bonds sold well below par value.
- Deep discounted rights issue** A rights issue price is much less than the present market price of the old shares.
- Default** A failure to make agreed payments of interest or principal.
- Defensive industries** Those industries where profits are not particularly sensitive to the growth level in the economy.
- Defensive shares** Having a beta value of less than 1.
- Deferred ordinary shares** Rank below preferred ordinary shares for dividends. So, if profits are low deferred ordinary holders may not receive a dividend.
- Dematerialization** Traditionally the evidence of financial security ownership is by written statements on paper (e.g. share certificates). Increasingly such information is being placed on electronic records and paper evidence is being abandoned.
- Demerger** The separation of companies or business units that are currently under one corporate umbrella. It applies particularly to the unraveling of a merger.
- Depository receipts** Certificates, representing evidence of ownership of a company's shares held by a depository. They can be bought and sold.
- Derivative** A financial asset, the performance of which is based on (derived from) the behavior of the value of an underlying asset.
- Deutsche Borse** The German Stock Exchange based in Frankfurt.
- Differentiated product** One that is slightly different in significant ways than those supplied by other companies.
- Differentiation strategy** The unique nature of the product/service offered allows for a premium price to be charged.
- Diluted earnings per share** A measure of profits per share for the year that takes into account any additional shares that may be issued in the future under executive share option schemes and other commitments.
- Direct foreign investment** The purchase of commercial assets in another country such as factories and industrial plant for productive purposes.
- Directors dealings** The purchase or sale of shares in their own company. This is legal (except at certain times of the company's year or before announcements). Some investors examine directors dealings to decide whether to buy or sell.
- Directors report** Information and commentary on company performance and other matters contained in a company's annual report and accounts.
- Dirty price** On a bond a buyer pays a total of the clean price and the accrued interest since the last coupon payment.
- Disclosure of shareholdings** If a stake of 3 percent or more is held by one shareholder in a UK public company, then this has to be declared to the company.
- Discount** (a) The amount below face-value at which a financial claim sells, e.g. bill of exchange or zero coupon bond. (b) The extent to which an investment trust's shares sell below the net asset value. (c) The amount by which a future value of a currency is less than its spot value. (d) The action of purchasing financial instruments, e.g. bills, at a discount. (e) The degree to which a security sells below its issue price in the secondary market.

- Discount house** An institution that purchases promissory notes and resells them or holds them until maturity.
- Discount market deposit** Money deposited with a London discount house. Normally repayable at call or very short term. Clearing banks are the usual depositors.
- Discount rate** (1) The rate of return used to discount cash flows received in future years. It is the opportunity cost of capital given the risk class of the future cash flows. (2) The rate of interest some central banks lend money to the banking system.
- Discounted cash flow** Future cash flows are converted into the common denominator of time zero money by adjusting for the time value of money.
- Discounted payback** The period of time required to recover initial cash outflow when the cash inflows are discounted at the opportunity cost of capital.
- Discounting** The process of reducing future cash flows to a present value using an appropriate discount rate.
- Disintermediation** Borrowing firms bypassing financial institutions and obtaining debt finance directly from the market.
- Diversifiable risk** *See* Unsystematic risk.
- Diversification** To invest in varied projects, enterprises, financial securities, etc.
- Divestiture** To remove assets from a company or individual.
- Dividend** The profit paid to ordinary shareholders, usually on a regular basis.
- Dividend cover** The number of times net profits available for distribution exceed the dividend actually paid or declared. Earnings per share divided by gross dividend per share *or* total post-tax profits divided by total dividend payout.
- Dividend per share** The total amount paid or due to be paid in dividends for the year (interim and final) divided by the number of shares in issue.
- Dividend policy** The determination of the proportion of profits paid out to shareholders, usually periodically.
- Dividend reinvestment plan (DRIP)** A shareholder receives shares in lieu of a cash dividend. This avoids the cost and trouble of receiving cash and then reinvesting.
- Dividend yield** The amount of dividend paid on each share as a percentage of the share price.
- Dividend valuation models (DVM)** These methods of share valuation are based on the premise that the market value of ordinary shares represents the sum of the expected future dividend flows, to infinity, discounted to present value.
- Divisible projects** It is possible to undertake a fraction of a project.
- Divorce of ownership and control** In large corporations shareholders own the firm but may not be able to exercise control. Managers often have control because of a diffuse and divided shareholder body, proxy votes and apathy.
- Dominance** When one (investment) possibility is clearly preferable to a risk-averse investor because it possesses a better expected return than another possibility for the same level of risk.
- Dow or Dow Jones Industrial Average** The best known index of movements in the price of US stocks and shares. There are 30 shares in the index.

**Drawdown arrangement** A loan facility is established and the borrower uses it (takes the money available) in stages as the funds are required.

**Early-settlement discount** The reduction of a debt owed if it is paid at an early date.

**Early-stage capital** Funds for initial manufacturing and sales for a newly formed company. High-risk capital available from entrepreneurs, business angels and venture capital funds.

**Earn-out** The purchase price of a company is linked to the future profits performance. Future instalments of the purchase price may be adjusted if the company performs better or worse than expected.

**Earning power** The earning (profit) capacity of a business in a normal year. What the company might be expected to earn year after year if the business conditions continue unchanged.

**Earnings guidance** A company guiding analysts to estimates of profits for the current period.

**Earnings multiple** Price earnings ratio.

**Earnings per share (EPS)** Profit after tax and interest divided by number of shares in issue.

**Earnings yield** Earnings per share divided by current market price of share.

**EASDAQ (European Association of Securities Dealers Automated Quotation)** A Europe-wide stock exchange aimed at innovative, young and fast-growing companies. Now closed.

**EBIT** A company's earnings (profits) before interest and taxes are deducted.

**EBITDA** Earnings before interest, taxation, depreciation and amortization. Or as cynics have it: Earnings Before I Tricked The Dumb Auditor.

**Economic franchise** Pricing power combined with strong barriers to entry. The strength and durability of an economic franchise is determined by (a) the structure of the industry, (b) the ability of the firm to rise above its rivals in its industry and generate exceptional long run rates of return on capital employed.

**Economic book value** A term used by Stern Stewart and Co. It is based on the balance sheet capital employed figure subject to a number of adjustments.

**Economic order quantity (EOQ)** The quantity of inventory items (e.g. raw material) to order on each occasion which minimizes the combined costs of ordering and holding stock.

**Economic profit (EP)** For a period the economic profit is the amount earned by a business after deducting all operating expenses and a charge for the opportunity cost of the capital employed.

**Economic risk** The risk that a company's economic value may decline as a result of currency movements causing a loss in competitive strength.

**Economic value added (EVA)** Developed by Stern Stewart and Co. A value-based metric of corporate performance which multiplies the invested capital (after adjustments) by the spread between the (adjusted) actual return on capital and the weighted cost of capital. The adjustments are to the profit figures to obtain the actual return and to the balance sheet to obtain the invested capital figure.

**Economies of scale** Larger size of output often leads to lower cost per unit of output.

**Economies of scope** The ability to reduce unit costs of an item by sharing some costs between a number of product lines, e.g. using the same truck to deliver both ketchup and beans to a store.

**Ecu (European currency unit)** A composite of European Union (EU) member states' currencies weighted by the member state's share of EU output.

**EDX London** An equity derivative exchange based in London owned by the London Stock Exchange and OM AM of Sweden.

**Efficient portfolio** A portfolio that offers the highest expected return for a given level of risk (standard deviation) and the lowest risk for its expected return.

**Efficient stock market (Efficient market hypothesis, EMH)** Prices rationally reflect available information. The efficient market hypothesis (EMH) implies that new information is incorporated into a share price (a) rapidly, and (b) rationally. In an efficient market no trader will be presented with an opportunity for making an abnormal return, except by chance.

**EGM** *See* Extraordinary general meeting.

**Electronic settlement** Transferring shares from sellers to buyers without certificates – computer entry only.

**Electronic funds transfer at a point of sale (EFTPOS)** A computerized system allowing the automatic transfer of money from a buyer to a seller of goods or services at the time of sale.

**Emerging markets** Security markets in newly industrializing countries with capital markets at an early stage of development.

**Employee share ownership plans (ESOP)** Schemes designed to encourage employees to build up a shareholding in their company.

**Endowment policies** Insurance policies in which a lump sum is payable, either at the end of the term of the policy or on death during the term of the policy.

**Endowment saving schemes** Life assurance schemes with the additional feature of a huge lump sum payment at the end of a period, should the policyholder survive. One important use is for the repayment of house mortgages.

**Enfranchisement** Granting voting rights to holders of non-voting shares.

**Enterprise investment scheme (EIS)** Tax relief is available to investors in qualifying company shares (unquoted firms not involved in financial investment and property).

**Enterprise value** The sum of a company's total equity market capitalization and borrowings.

**Entrepreneur** Defined by economists as the owner-manager of a firm. Usually supplies capital, organizes production, decides on strategic direction and bears risk.

**Equilibrium in markets** When the forces of supply and demand are evenly balanced.

**Equities** An ownership share of a business, each equity share represents an equal stake in the business.

**Equitization** An increasing emphasis placed on share (equity) finance and stock exchanges in economies around the world. A growing equity culture.

- Equity kicker (sweetener)** The attachment of some rights to participate in and benefit from a good performance (e.g. exercise option to purchase shares) to a bond or other debt finance. Used with mezzanine finance.
- Equity-linked bonds** *See* Convertible bonds.
- Equity shareholder's funds** *See* Shareholder's funds.
- Euro** The name of the new single European currency.
- Euro medium-term notes (EMTN)** *See* Medium-term note.
- Euromarkets** Markets outside of the jurisdictions of any country; often termed international securities markets. No connection with the new currency in the eurozone. Euromarkets began in the late 1950s.
- Euro-commercial paper** *See* Commercial paper.
- Euro-security markets** Informal (unregulated) markets in money held outside the jurisdiction of the country of origin, e.g. Swiss Francs lending outside of the control of the Swiss authorities – perhaps the Francs are in London.
- Eurobond** Bond sold outside the jurisdiction of the country in whose currency the bond was denominated. For example, a bond issued in Yen outside of Japan.
- Eurocurrency** Currency held outside its country of origin. For example, Australian dollars held outside of Australia. Note: this market existed long before the creation of the new currency in the eurozone. It has no connection with the euro.
- Eurodollar** A deposit or credit of dollars held outside of the regulation of the US authorities, say in Tokyo, London or Paris. No connection with the currency in the eurozone.
- European exchange rate mechanism (ERM)** A system set up by members of the European Union which restricts the movement of the currencies of those member states belonging to the system.
- European Monetary Union (EMU)** A single currency with a single central bank having control over interest rates being created for those EU Member States which join. The process of moving towards a monetary union began in 1999.
- Euronext** The combined financial stock market comprising of the French, Dutch, Belgium and Portuguese bourses.
- Euronext.liffe** Euronext, the organization combining the French, Dutch, Belgium and Portuguese stock markets, bought LIFFE and renamed it Euronext.liffe.
- European-style options** Options which can only be exercised by the purchaser on a predetermined future date.
- Eurozone** Those countries that joined together in adopting the euro as their currency.
- Event risk** The risk that some future event may increase the risk on a financial investment, e.g. an earthquake event affects returns on Japanese bonds.
- Ex-ante** Intended, desired or expected before the event.
- Ex-coupon** A bond sold without the right to the next interest payment.
- Ex-dividend** When a share or bond is designated ex-dividend a purchaser will not be entitled to a recently announced dividend or the accrued interest on the bond since the last coupon – the old owner will receive the dividend (coupon).

**Ex-post** The value of some variable after the event.

**Ex-rights** When a share goes 'ex-rights' any purchaser of a share after that date will not have a right to subscribe for new shares in the rights issue.

**Ex-rights price of a share** The theoretical market price following a rights issue.

**Exceptional items** Gains or costs which are part of the company's ordinary activities but are either unusual in themselves or have an exceptionally large impact on profits that year.

**Exchange controls** The state controls the purchase and sale of currencies by its residents.

**Exchangeable bond** A bond that entitles the owner to choose at a later date whether to exchange the bond for shares in a company. The shares are in a company other than the one that issued the bonds.

**Exchange rate** The price of one currency expressed in terms of another.

**Exclusive franchise** *See* Economic franchise.

**Execution-only brokers** A stockbroker who will buy or sell shares cheaply but will not give advice or other services.

**Exercise price (strike price)** The price at which an underlying will be bought (call) or sold (put) under an option contract.

**Exit** The term used to describe the point at which a venture capitalist can recoup some or all of the investment made.

**Exit barrier** A factor preventing firms from stopping production in a particular industry.

**Exotic** A term used to describe an unusual financial transaction, e.g. exotic option, exotic currency (i.e. one with few trades).

**Expansion capital** Companies at a fast-development phase needing capital to increase production capacity, working capital and capital for the further development of the product or market. Venture capital is often used.

**Expected return** The mean or average outcome calculated by weighting each of the possible outcomes by the probability of occurrence and then summing the result.

**Expectations hypothesis of the term structure of interest rates (yield curve)** Long-term interest rates reflect the market consensus on the changes in short-term interest rates.

**Expectations theory of foreign exchange** The current forward exchange rate is an unbiased predictor of the spot rate at that point in the future.

**Experience curve** The cost of performing a task reduces as experience is gained through repetition.

**Expiry date of an option** The time when the rights to buy or sell the option cease.

**External finance** Outside finance raised by a firm, i.e. finance that it did not generate internally, for example through profits retention.

**External metrics** Measures of corporate performance which are accessible to individuals outside the firm and concern the performance of the firm as a whole.

**Extraordinary general meeting (EGM)** A meeting of the company (shareholders and directors) other than the annual general meeting. It may be convened when the directors think fit. However, shareholders holding more than 10 percent of the paid-up share capital carrying voting rights can requisition a meeting.

**Extraordinary resources** Those that give the firm a competitive edge. A resource, which when combined with other (ordinary) resources enables the firm to outperform competitors and create new value generating opportunities. Critical extraordinary resources determine what a firm can do successfully.

**Face value** *See* Par value.

**Factor model** A model which relates the returns on a security to that security's sensitivity to the movements of various factors (e.g. GDP growth, inflation) common to all shares.

**Factor risk/Non-factor risk** A factor risk is a systematic risk in multi-factor models describing the relationship between risk and return for fully diversified investors. Non-factor risk is unsystematic risk in multi-factor models.

**Factoring** To borrow against the security of trade debtors. Factoring companies also provide additional services such as sales ledger administration and credit insurance.

**Fair game** In the context of a stock market it is where some investors and fund raisers are not able to benefit at the expense of other participants. The market is regulated to avoid abuse, negligence and fraud. It is cheap to carry out transactions and the market provides high liquidity.

**Fair value** The amount an asset could be exchanged for in an arm's-length transaction between informed and willing parties.

**Fallen angel** Debt which used to rate as investment grade but which is now regarded as junk, mezzanine finance or high-yield finance.

**Filter approach to investment** A technique for examining shares using historic price trends. The trader focusses on the long-term trends by filtering out short-term movements.

**Final dividend** The dividend announced with the annual accounts. The final dividend plus the interim dividend make the total dividend for the year for a company that reports results every six months.

**Finance house** A financial institution offering to supply finance in the form of hire purchase, leasing and other forms of instalment credit.

**Finance lease** (also called **capital lease** or **full payout lease**) The lessor expects to recover the full cost (or almost the full cost) of the asset plus interest, over the period of the lease.

**Financial assets (securities)** Contracts that state agreement about the exchange of money in the future.

**Financial distress** Obligations to creditors are not met or are met with difficulty.

**Financial gearing (leverage)** *See* Gearing.

**Financial risk** The additional variability in a firm's returns to shareholders which arises because the financial structure contains debt.

**Financial Services Authority (FSA)** The chief financial services regulator in the UK.

**Financial Services and Markets Act** The 2000 Act (and orders made under it) form the bedrock of financial regulations in the UK.

**Financial slack** Having cash (or near-cash) and/or spare debt capacity available to take up opportunities as they appear.



- Financing gap** The gap in the provision of finance for medium-sized, fast-growing firms. Often these firms are too large or fast growing to ask the individual shareholders for more funds or to obtain sufficient bank finance. Also they are not ready to launch on the stock market.
- Finished goods inventory period** The number of days for which finished goods await delivery to customers. Equal to the average value of finished goods in stock divided by the average goods sold per day.
- Fisher's equation** The money rate of return  $m$  is related to the real rate of return  $h$  and the expected inflation rate  $i$  through the following equation:  $(1 + m) = (1 + h)(1 + i)$ .
- Fixed assets** Those not held for resale, but for use in the business.
- Fixed charge** (e.g. **fixed charged debenture or loan**) A specific asset(s) is assigned as collateral security for a debt.
- Fixed exchange rate** The national authorities act to ensure that the rate of exchange between two currencies is constant.
- Fixed-interest securities** Securities such as bonds on which the holder receives a predetermined interest pattern on the par value (e.g. gilts, corporate bonds, eurobonds).
- Fixed-rate borrowing (fixed interest)** The interest rate charge is constant throughout the period of the loan.
- Flat rate** The rate of interest quoted by a hire purchase company (or other lender) to a hiree. This fails to reflect properly the true interest rate being charged as measured by the annual percentage rate (APR).
- Flat yield** *See* Yield.
- Float** The difference between the cash balance shown on a firm's checkbook and the bank account. Caused by delays in the transfer of funds between bank accounts.
- Floating charge** The total assets of the company or an individual are used as collateral security for a debt.
- Floating exchange rate** A rate of exchange which is not fixed by national authorities but fluctuates depending on demand and supply for the currency.
- Floating rate notes (FRNs)** Notes issued in which the coupon fluctuates according to a benchmark interest rate charge (e.g. LIBOR). Issued in the Euromarkets generally with maturities of 7 to 15 years. Reverse floaters: the interest rate declines as LIBOR rises.
- Floating-rate borrowing (floating interest)** The rate of interest on a loan varies with a standard reference rate, e.g. LIBOR.
- Floor** An agreement whereby, if interest rates fall below an agreed level, the seller (floor writer) makes compensatory payments to the floor buyer.
- Flotation** The issue of shares in a company for the first time on a stock exchange.
- Focus strategy** The selection of a segment in the industry to serve to the exclusion of others.
- 'Footsie'** Nickname for FTSE 100 index. Trade marked.
- Foreign banking** Transactions in the home currency with non-residents.

- Foreign bond** A bond denominated in the currency of the country where it is issued when the issuer is a non-resident.
- Foreign exchange control** Limits are placed by a government on the purchase and sale of foreign currency.
- Foreign exchange markets (Forex or FX)** Markets that facilitate the exchange of one currency into another.
- Forex** A contraction of 'foreign exchange'.
- Forfeiting** A bank purchases a number of sales invoices or promissory notes from an exporting company; usually the importer's bank guarantees the invoices.
- Forward** A contract between two parties to undertake an exchange at an agreed future date at a price agreed now.
- Forward-rate agreement (FRA)** An agreement about the future level of interest rates. Compensation is paid by one party to the other to the extent that market interest rates deviate from the 'agreed' rate.
- Founders' shares** Dividends are paid only after all other categories of equity shares have received fixed rates of dividend. They usually carry a number of special voting rights over certain company matters.
- Free cash flow** Cash generated by a business not required for operations or for reinvestment. Profit before depreciation, amortization and provisions, but after interest, tax, capital expenditure on long-lived items and increases in working capital – necessary to maintain the company's competitive position and accept all value generating investments.
- Free float** The proportion of a quoted company's shares not held by those closest (e.g. directors, founding families) to the company who may be unlikely to sell their shares.
- Frequency function (probability or frequency distribution)** The organization of data to show the probabilities of certain values occurring.
- Friendly mergers** The two companies agree to the merger.
- Friendly Society** A mutual (co-operative) organization involved in saving and lending.
- FTSE 100 share index** An index representing the UK's 100 largest listed shares.
- FT-SE Actuaries All-Share Index (the 'All-Share')** The most representative index of UK shares, reflecting over 700 companies' shares.
- FTSE International (Financial Times and the London Stock Exchange)** This organization calculates a range of share indices published on a regular (usually daily) basis.
- Full-payout lease** *See* Leasing.
- Fund management** Investment of and administering a quantity of money, e.g. pension fund, insurance fund, on behalf of the fund's owners.
- Fund raising** Companies can raise money through rights issues, etc.
- Fundamental analysts** Individuals that try to estimate a share's true value, based on future returns to the company.
- Fundamental beta** An adjustment to the risk premium on the average share, developed by Barr Rosenberg and others, which amalgamates a number of operating and financial characteristics of the specific company being examined.

**Fungible** Interchangeable securities; can be exchanged for each other on identical terms.

**Future** A contract between two parties to undertake a transaction at an agreed price on a specified future date.

**GAAP** Generally accepted accounting principles. United States accounting rules for reporting results.

**GDP (nominal, real)** Gross domestic product, the sum of all output of goods and services produced by a nation. Nominal means including inflation, and real means with inflation removed.

**Gearing (financial gearing)** The proportion of debt capital in the overall capital structure. Also called leverage. High gearing can lead to exaggeratedly high returns if things go well or exaggerated losses if things do not go well.

**Gearing (operating)** The extent to which the firm's total costs are fixed. This influences the break-even point and the sensitivity of profits to changes in sales level.

**General inflation** The process of steadily rising prices resulting in the diminishing purchasing power of a given nominal sum of money. Measured by an overall price index which follows the price changes of a 'basket' of goods and services through time.

**General insurance** Insurance against specific contingencies, e.g. fire, theft and accident.

**Geometric mean** The geometric mean of a set of  $n$  positive numbers is the  $n$ th root of their product. The compound rate of return, e.g. the geometric mean of 2 and 5 is  $\sqrt{2 \times 5} = \sqrt{10} = 3.16$ .

**Gilts (gilt-edged securities)** Fixed-interest UK government securities (bonds) traded on the London Stock Exchange. A means for the UK government to raise finance from savers. They usually offer regular interest and a redemption amount paid years in the future.

**Globalization** The increasing internationalization of trade, particularly financial product transactions. The integration of economic and capital markets throughout the world.

**Goal congruence** The aligning of the actions of senior management with the interests of shareholders.

**Going concern** A judgment as to whether a company has sufficient financial strength to continue for at least one year. Accounts are usually drawn up on the assumption that the business is a going concern.

**Going public** A phrase used when a company becomes quoted on a stock exchange (the company may have been a public limited company, plc, for years before this).

**Going long** Buying a financial security (e.g. share) in the hope that its price will rise.

**Going short** *See* short selling.

**Golden handcuffs** Financial inducements to remain working for a firm.

**Golden parachutes** In a hostile merger situation, managers will receive large pay-offs if the firm is acquired.

**Golden shares** Shares with extraordinary special powers over the company, e.g. power of veto over a merger.

**Good growth** When a firm grows by investment in positive performance-spread activities.

**Goodwill** An accounting term for the difference between the amount that a company pays for another company and the market value of the other company's assets. Goodwill is thus an intangible asset representing things like the value of the company's brand names and the skills of its employees.

**Grace period** A lender grants the borrower a delay in the repayment of interest and/or principal at the outset of a lending agreement.

**Greenbury report** Recommendations on corporate governance.

**Greenmail** Key shareholders try to obtain a reward (e.g. the repurchase of their shares at a premium) from the company for not selling to a hostile bidder or becoming a bidder themselves.

**Greenshoe** An option that permits an issuing house, when assisting a corporation in a new issue, to sell more shares than originally planned. They may do this if demand is particularly strong.

**Gross dividend yield**

$$\frac{\text{Gross (before tax) dividend per share}}{\text{Share Price}} \times 100$$

**Gross domestic product** *See* GDP.

**Gross margin** *See* Gross profit margin.

**Gross profit** Turnover less cost of sales.

**Gross profit margin (gross margin)** Profit defined as sales minus cost of sales expressed as a percentage of sales.

**Gross present value** The total present value of all the cash flows, excluding the initial investment.

**Growth industries** Those industries which grow almost regardless of the state of the economy.

**Guaranteed loan stock** An organization other than the borrower guarantees to the lender the repayment of the principal plus the interest payment.

**Hampel report** A follow-up to the Cadbury and Greenbury reports on corporate governance. Chaired by Sir Ronald Hampel and published in 1998.

**Hang Seng Index** Main index for Hong Kong shares.

**Hard capital rationing** Agencies external to the firm will not supply large amounts of investment capital, even though positive NPV projects are identified.

**Hard currency** A currency traded in a foreign exchange market for which demand is persistently high.

**Headline (underlying, adjusted or normalized) earnings per share** Directors produce these profit per share numbers by excluding one-off costs, exceptional items and goodwill amortization to show underlying profit per share trend (or just to make the managerial performance look better).

**Hedge fund** A collective investment vehicle that operates free from regulation allowing it to take steps in managing a portfolio that other fund managers are unable to take, e.g. borrow to invest, shorting the market.

**Hedging** Reducing or eliminating risk by undertaking a countervailing transaction.

**Herstatt risk** In 1974 the German bank Herstatt was closed by the Bundesbank. It had entered into forex transactions and received deutschmarks from counterparties in European time, but had not made the corresponding transfer of US dollars to its counterparties in New York time. It is the risk that arises when forex transactions are settled in different time zones.

**Higgs Committee Report** Recommendations on corporate governance published in 2003.

**High-yield shares (yield stocks)** Shares offering a high current dividend yield because the share price is low due to the expectation of low growth in profits and dividends. Sometimes labeled value shares.

**High-yield debt** *See* Mezzanine finance or Junk bonds.

**Hire-purchase (HP)** The user (hiree) of goods pays regular instalments of interest and principal to the hire-purchase company over a period of months. Full ownership passes to the hiree at the end of the period (the hiree is able to use the goods from the outset).

**Holding company** *See* Parent company.

**Holding period returns** Total holding period returns on a financial asset consist of (a) income, e.g. dividend paid, and (b) capital gain – a rise in the value of the asset.

**Homemade dividends** Shareholders creating an income from shareholdings by selling a portion of their shareholding.

**Horizontal merger** The two companies merging are engaged in similar lines of activity.

**Hostile merger** The target (acquired) firm's management is opposed to the merger.

**Hubris** Overweening self-confidence.

**Hurdle rate** The required rate of return. The opportunity cost of the finance provider's money.

**Impact day** The day during the launch of a new issue of shares when the price is announced, the prospectus published and offers to purchase solicited.

**Income gearing** The proportion of the annual income streams (i.e. pre-interest profits) devoted to the prior claims of debt holders. The reciprocal of income gearing is the interest cover.

**Income statement** Alternative title for profit and loss account.

**Income yield** *See* Yield.

**Incorporation** The forming of a company, including the necessary legal formalities.

**Incremental fixed capital investment** Investment in fixed assets which adds to the stock of assets and does not merely replace worn-out assets.

**Independent director** One that is not beholden to the dominant executive directors. Customers, suppliers or friends of the founding family are not independent, for example.

**Independent variables** The two variables are completely unrelated; there is no co-movement.

- Index** *See* Market index.
- Index option** An option on a share index, e.g. FTSE 100 or Standard and Poor's 500.
- Index trackers** Collective investment funds (e.g. unit trusts) which try to replicate a stock market index rather than to pick winners in an actively managed fund.
- Industry attractiveness** The economics of the market for the product(s) part of which is determined by industry structure.
- Industry structure** The combination of the degree of rivalry within the industry among existing firms; the bargaining strength of industry firms with suppliers and customers; and the potential for new firms to enter and for substitute products to take customers. The industry structure determines the long run rate of return on capital employed within the industry.
- Inflation** The process of prices rising.
- Informal venture capitalist** An alternative name for business angel.
- Informed investors** Those that are highly knowledgeable about financial securities and the fundamental evaluation of their worth.
- Initial margin** An amount that a derivative contractor has to provide to the clearing house when first entering upon a derivative contract.
- Initial public offering (IPO)** 'New Issue' The offering of shares in the equity of a company to the public for the first time.
- Inland Revenue** The principal tax-collecting authority in the UK.
- Insider trading (dealing)** Trading shares, etc. on the basis of information not in the public domain.
- Instalment credit** A form of finance to pay for goods or services over a period through the payment of principal and interest in regular instalments.
- Institutional neglect** Share analysts, particularly at the major institutions, may fail to spend enough time studying small firms, preferring to concentrate on the larger 100 or so.
- Institutionalization** The increasing tendency for organizational investing, as opposed to individuals investing money in securities (e.g. pension funds and investment trusts collect the savings of individuals to invest in shares).
- Insurable risk** Risk that can be transferred through the payment of premiums to insurance companies.
- Intangible assets** Those that you cannot touch.
- Interbank brokers** Brokers in the forex markets who act as intermediaries between buyers and sellers. They provide anonymity to each side.
- Interbank sterling** The money market in which banks borrow and lend sterling among themselves.
- Interest cover** The number of times the income of a business exceeds the interest payments made to service its loan capital.
- Interest rate parity (IRP) of exchange rate determination** The interest rate parity theory holds true when the difference between spot and forward exchange rates is equal to the differential between interest rates available in the two currencies.
- Interest rate risk** The risk that changes in interest rates will have an adverse impact.

**Interest rate swap** *See* Swap.

**Interest yield** *See* Yield.

**Interim dividend** A dividend related to the first half-year's trading.

**Interim profit reports** A statement giving unaudited profit figures for the first half of the financial year, shortly after the end of the first half-year.

**Intermediaries offer** A method of selling shares in the new issue market. Shares are offered to financial institutions such as stockbrokers. Clients of these intermediaries can then apply to buy shares from them.

**Intermediate debt** *See* Mezzanine finance or Junk bonds.

**Internal metrics** Measures of corporate performance available to those inside the company. They can be used at the corporate, SBU or product line level.

**Internalization of transactions** By bringing together two firms at different stages of the production chain in a vertical merger, an acquirer may achieve more efficient co-ordination of the different levels.

**International Petroleum Exchange (IPE)** The energy futures and options exchange in London.

**International Securities Market Association (ISMA)** A self-regulatory organization designed to promote orderly trading and the general development of the Euromarkets.

**In-the-money option** An option with intrinsic value. For a call option the current underlying price is more than the option exercise price. For a put option the current price of the underlying is below the exercise price.

**Intrinsic value (company)** The discounted value of the cash that can be taken out of a business during its remaining life.

**Intrinsic value (options)** The pay-off that would be received if the underlying is at its current level when the option expires.

**Introduction** A company with shares already quoted on another stock exchange, or where there is already a wide spread of shareholders, may be introduced to the market. This allows a secondary market in the shares.

**Inventory** *See* Stock.

**Investment bank** Banks that carry out a variety of financial services, usually excluding high street banking. Their services are usually fee based, e.g. fees for merger advice to companies.

**Investment grade debt** Debt with a sufficiently high credit rating to be regarded as safe enough for some institutional investors.

**Invoice** An itemized list of goods shipped, usually specifying the terms of sale and price.

**Invoice discounting** Separate (or a select few of) invoices are pledged to a finance house in return for an immediate payment of up to 80 per cent of the face value.

**IOU** A colloquialism intended to mean 'I owe you'. The acknowledgement of a debt.

**Irredeemable** Financial securities with no fixed maturity date at which the principal is repaid.

**Irrelevancy of the dividend proposition (by Modigliani and Miller)** If a few assumptions can be made, dividend policy is irrelevant to share value.

**Issued share capital** That part of a company's share capital that has been subscribed by shareholders, either paid up or partially paid up.

**Issuing house** *See* Sponsor.

**Joint stock enterprise** The capital is divided into small units, permitting a number of investors to contribute varying amounts to the total. Profits are divided between stockholders in proportion to the number of shares they own.

**Junior debt** *See* Subordinated debt.

**Junk bonds** Low-quality, low credit-rated company bonds. Rated below investment grade. Risky and with a high yield.

**Just-in-time stock holding** Materials and work-in-progress are delivered just before they are needed and finished goods are produced just before being sent to customers.

**Lagging** The postponement of a payment beyond the due date.

**Laissez-faire** The principle of the non-intervention of government in economic affairs.

**Lead manager** In a new issue of securities (e.g. shares, bonds, syndicated loans) the lead manager controls and organizes the issue. There may be joint lead managers, co-managers and regional lead managers.

**Lead time** The delay between placing an order with a supplier and the order being delivered.

**Leading** The bringing forward from the original due date of the payment of a debt.

**Leasing** The owner of an asset (lessor) grants the use of the asset to another party (lessee) for a specified period in return for regular rental payments. The asset does not become the property of the lessee at the end of the specified period. Finance lease (the leasing agreement is for 90% of the value of the asset); Operating lease (the leasing agreement is short term – much less than the life of the asset).

**Leverage** *See* Gearing.

**Leveraged buyout (LBO)** The acquisition of a company, subsidiary or unit by another, financed mainly by borrowings.

**Leveraged recapitalizations** The financial structure of the firm is altered in such a way that it becomes highly geared.

**LIBOR (London Interbank Offered Rate)** The rate of interest offered on loans to highly rated (low-risk) banks in the London interbank market for a specific period (e.g. three months). Used as a reference rate for other loans.

**Life cycle stage of value creation** The longevity of competitive advantage and favorable industry economics can be represented in terms of a life cycle with four stages: development, growth, maturity and decline. In the early stages superior long-term value performance is expected because of a sustainable competitive advantage and favorable long-term industry economics.



**Life insurance** Insurance against death. Beneficiaries receive payment upon death of the policyholder or other person named in the policy. Endowment policies offer a savings vehicle as well as cover against death.

**LIFFE CONNECT™** The computer system used by euronext.liffe for trading derivatives.

**LIFFE (London International Financial Futures and Options Exchange)** The main derivatives exchange in London – now called euronext.liffe.

**Limited companies (Ltd)** ‘Private’ companies with no minimum amount of share capital, but with restrictions on the range of investors who can be offered shares. They cannot be quoted on the London Stock Exchange.

**Limited liability** The owners of shares in a business have a limit on their loss, set as the amount they have committed to invest in shares.

**Liquidation of a company** The winding-up of the affairs of a company when it ceases business. This could be forced by an inability to make payment when due or it could be voluntary when shareholders choose to end the company. Assets are sold, liabilities paid (if sufficient funds) and the surplus (if any) is distributed to shareholders.

**Liquidity** The degree to which an asset can be sold quickly and easily without loss in value.

**Liquidity risk** The risk that an organization may not have, or may not be able to raise, cash funds when needed.

**Liquidity-preference hypothesis of the term structure of interest rates** The yield curve is predominately upward sloping because investors require an extra return for lending on a long-term basis.

**Listed companies** Those on the Official List of the London Stock Exchange.

**Listing agreement** The UK Listing Authority insists that a company signs a listing agreement committing the directors to certain standards of behavior and levels of reporting to shareholders.

**Listing particulars** *See* Prospectus.

**Lloyds Insurance Market** A medium-sized insurance business in London founded over two centuries ago. ‘Names’ supply the capital to back insurance policies. Names can now be limited liability companies rather than individuals with unlimited liability to pay up on an insurance policy.

**LME** London Metal Exchange.

**Loan stock** A fixed-interest debt financial security. May be unsecured.

**Local authority deposits** Lending money to a UK local government authority.

**London Clearing House (LCH)** Settles mutual indebtedness between a number of organizations. It settles (‘clears’) trades for LIFFE traders, for example, and guarantees all contracts. It often acts as counterparty to all trades on an exchange.

**London Metal Exchange (LME)** Trades metals (e.g. lead, zinc, tin, aluminum and nickel) in forward and option markets.

**London Stock Exchange (LSE)** The London market in which securities are bought and sold.

**London Traded Option Market (LTOM)** Options exchange which merged with LIFFE in 1992.

**Long-form report** A report by accountants for the sponsor of a company being prepared for flotation. The report is detailed and confidential. It helps to reassure the sponsors when putting their name to the issue and provides the basis for the short-form report included in the prospectus.

**Long position** A positive exposure to a quantity. Owning a security or commodity; the opposite of a short position (selling).

**Long-range structural analysis** A process used to forecast the long-term rates of return of an industry.

**Low-grade debt** *See* Mezzanine finance or Junk bonds.

**Low yield shares (stocks)** Shares offering a relatively low dividend yield expected to grow rapidly. Often labeled growth stocks.

**Ltd** Private limited company.

**M & A** Merger and acquisition.

**Macro economics** The study of the relationships between broad economic aggregates: national income, saving, investment, balance of payments, inflation taxation, etc.

**Maintenance margin (futures)** The level of margin that must be maintained on a futures account (usually at a clearing house). Daily marking to market of the position may reveal the necessity to put more money into the account to top up to the maintenance margin.

**Management buy-in (MBI)** A new team of managers makes an offer to a company to buy the whole company, a subsidiary or a section of the company, with the intention of taking over the running of it themselves. Venture capital often provides the major part of the finance.

**Management buyout (MBO)** A team of managers makes an offer to its employers to buy a whole business, a subsidiary or a section so that the managers own and run it themselves. Venture capital is often used to finance the majority of the purchase price.

**Managementism/Managerialism** Management not acting in shareholders best interests by pursuing objectives attractive to the management team. Three levels:

- (a) dishonest managers;
- (b) honest but incompetent managers;
- (c) honest and competent but as humans are subject to the influence of conflicts of interest.

**Mandatory bid** If 30 percent or more of the shares of a company are acquired the holder is required under Takeover Panel rules to bid for all the company's shares.

**Margin (futures)** Money placed aside to back a futures purchase or sale. This is used to reassure the counterparty to the future that money will be available should the purchaser/seller renege on the deal.

**Marché à Terme d'Instruments Financiers (MATIF)** The French futures and options exchange.

**Market capitalization** The total value at market prices of the shares in issue for a company (or a stock market, or a sector of the stock market).

**Market in managerial control** Teams of managers compete for control of corporate assets, e.g. through merger activity.

**Market index** A sample of shares is used to represent a share (or other) market's level and movements.

**Market makers** Organizations that stand ready to buy and sell shares from investors on their own behalf at the center of the London Stock Exchange's quoted-driven system of share trading.

**Market portfolio** A portfolio which contains all assets. Each asset is held in proportion to the asset's share of the total market value of all the assets. A proxy for this is often employed, e.g. the FTSE 100 index.

**Market power** The ability to exercise some control over the price of the product.

**Market risk** *See* Systematic risk.

**Market segmentation hypothesis of the term structure of interest rates** The yield curve is created (or at least influenced) by the supply and demand conditions in a number of sub-markets defined by maturity range.

**Market to book ratio (MBR)** The market value of a firm divided by capital invested.

**Market value added** The difference between the total amount of capital put into a business by finance providers (debt and equity) and the current market value of the company's shares and debts.

**Marking to market** The losses or gains on a derivative contract are assessed daily in reference to the value of the underlying price.

**Matador** A foreign bond issued in Spain.

**Matching** The company matches the inflows and outflows in different currencies created by overseas trade, etc., so that it is only necessary to deal on the currency markets for the unmatched portion of the total transactions.

**Matching principle** The maturity structure of debt matches the maturity of projects or assets held by the firm. Short-term assets are financed by short-term debt and long-term assets are financed by long-term debt.

**Matched-bargain systems** *See* Order-driven trading system.

**Maturity date** The time when a financial security (e.g. a bond) is redeemed and the par value is paid to the lender.

**Maturity structure** The profile of the length of time to the redemption and repayment of a company's various debts.

**Maturity transformation** Intermediaries offer securities with liquid characteristics to induce primary investors to purchase or deposit funds. The money raised is made available to the ultimate borrowers on a long-term, illiquid basis.

**Maximization of long-term shareholder wealth** The assumed objective of the firm in finance. It takes into account the time value of money and risk.

**Mean** (a) arithmetic mean: a set of numbers are summed, and the answer is divided by the number of numbers; (b) geometric mean: calculated as the  $n$ th root of the product of  $n$  number, e.g. the geometric mean of 2 and 5 is  $\sqrt{2 \times 5} = \sqrt{10} = 3.16$ .

- Mean-variance rule** If the expected return on two projects is the same but the second has a higher variance (or standard deviation), then the first will be preferred. Also, if the variance on the two projects is the same but the second has a higher expected return, the second will be preferred.
- Medium-term note (MTN)** A document setting out a promise from a borrower to pay the holders a specified sum on the maturity date and, in many cases, a coupon interest in the meantime. Maturity can range from nine months to 30 years. If denominated in a foreign currency, they are called Euro medium-term notes.
- Memorandum of Association** Lays down the rules which govern a company and its relations with the outside world, e.g. states the objective of the company.
- Merchant banks** *See* Investment bank.
- Merger** The combining of two business entities under common ownership.
- Metric** Method of measurement.
- Minority shareholder** A shareholder who owns less than 50 percent of a company.
- Mezzanine finance** Unsecured debt or preference shares offering a high return with a high risk. Ranked behind secured debt but ahead of equity. It may carry an equity kicker.
- Mobilization of savings** The flow of savings primarily from the household sector to the ultimate borrowers to invest in real assets. This process is encouraged by financial intermediaries.
- Model Code for Directors' Dealings** London Stock Exchange rules for directors dealing in shares of their own company.
- Modified internal rate of return (MIRR)** The rate of return which equates the initial investment with a project's terminal value, where the terminal value is the future value of the cash inflows compounded at the required rate of return (the opportunity cost of capital).
- Monetary policy** The deliberate control of the money supply and/or rates of interest by the central bank.
- Money cash flow** All future cash flows are expressed in the prices expected to rule when the cash flow occurs.
- Money market** Wholesale (large amounts) financial markets in which lending and borrowing on a short-term basis takes place (< 1 year).
- Money rate of return** The rate of return which includes a return to compensate for inflation.
- Monopoly** One producer in an industry. However for Competition Commission purposes a monopoly is defined as a market share of 25 percent.
- Moral hazard** The presence of a safety net (e.g. insurance policy) encourages adverse behavior (e.g. carelessness).
- Mortgage debentures** Bonds secured using property as collateral.
- Mutual funds** A collective investment vehicle the shares of which are sold to investors – a very important method of investing in shares in the USA.
- Mutually-owned organizations** Organizations run for the benefit of the members (usually the same as the consumers of the organization output) and not for shareholders. Examples include some insurance organizations, building societies and the co-operative societies.

**Naked call option writing** *See* Uncovered call option writing.

**NASDAQ (National Association of Securities Dealers Automated Quotation System)**

A series of computer-based information services and an order execution system for the US over-the-counter securities (e.g. share) market.

**National savings** Lending to the UK government through the purchase of bonds, and placing money into savings accounts.

**Near-cash (near-money)** Highly liquid financial assets but which are generally not usable for transactions and therefore cannot be fully regarded as cash.

**Negative covenants** Loan agreements conditions that restrict the actions and rights of the borrower until the debt has been repaid in full.

**Negotiability** (1) Transferable to another – free to be traded in financial markets. (2) Capable of being settled by agreement between the parties involved in a transaction.

**Net assets (Net worth) Net asset value (NAV)** Total assets minus all the liabilities. Fixed assets, plus stocks, debtors, cash and other liquid assets, minus long- and short-term creditors.

**Net current assets** The difference between current assets and current liabilities.

**Net operating cash flow** Profit before depreciation, less periodic investment in net working capital.

**Net present value (NPV)** The present value of the expected cash flows associated with a project after discounting at a rate which reflects the value of the alternative use of the funds.

**Net profit** Profit after tax.

**Net realizable value** What someone might reasonably be expected to pay less the costs of the sale.

**Netting** When subsidiaries in different countries settle intra-organizational currency debts for the net amount owed in a currency rather than the gross amount.

**New entrant** A company entering a market area to compete with existing players.

**New issue** The sale of securities, e.g. debentures or shares, to raise additional finance or to float existing securities of a company on a stock exchange for the first time.

**Newstrack** A small company news service and a place where share prices for companies trading on OFEX are posted.

**Niche company** A fast growing small to medium-sized firm operating in a niche business with high potential.

**Nikkei 225 Stock Average** A share index based on the prices of 225 shares quoted on the Tokyo Stock Exchange.

**Nil paid rights** Shareholders may sell the rights to purchase shares in a rights issue without having paid anything for these rights.

**Noise trading** Uninformed investors buying and selling financial securities at irrational prices, thus creating noise (strange movements) in the price of securities.

**Nominal return** The return on an investment including inflation. If the return necessary to compensate for the decline in purchasing power of money (inflation) is deducted from the nominal return we have the real rate of return.

**Nominal value** *See* Par value.

**Nominated adviser (Nomad)** Each company on the AIM has to retain a nomad. They act as quality controllers, confirming to the London Stock Exchange that the company has complied with the rules.

**Nominated brokers** Each company on the AIM has to retain a nominated broker, who helps to bring buyers and sellers together and comments on the firm's prospects.

**Non-executive director** A director without day-to-day operational responsibility for the firm.

**Non-voting shares** A company may issue two or more classes of ordinary shares, one of which may be of shares that do not carry any votes.

**Normal rate of return** A rate of return that is just sufficient to induce shareholders to put money into the firm and hold it there.

**Normalized earnings per share** *See* Headline earnings per share.

**Note (promissory note)** A financial security with the promise to pay a specific sum of money by a given date, e.g. commercial paper, floating rate notes. Usually unsecured.

**NYSE** The New York Stock Exchange.

**Objective probability** A probability that can be established theoretically or from historical data.

**OFEX** An unregulated share market offering a secondary market trading facility.

**Off-balance-sheet finance** Assets are acquired in such a way that liabilities do not appear on the balance sheet, e.g. some lease agreements permit the exclusion of the liability in the accounts.

**Offer document** A formal document sent by a company attempting to buy all the shares in a target firm to all the shareholders of the target setting out the offer.

**Offer for sale** A method of selling shares in a new issue. The company sponsor offers shares to the public by inviting subscriptions from investors. (a) Offer for sale by fixed price – the sponsor fixes the price prior to the offer. (b) Offer for sale by tender – investors state the price they are willing to pay. A strike price is established by the sponsors after receiving all the bids. All investors pay the strike price.

**Offer for subscription** A method of selling shares in a new issue. The issue is aborted if the offer does not raise sufficient interest from investors.

**Offer price** The price at which a marketmaker in shares will sell a share, or a dealer in other markets will sell a security or asset.

**Office of Fair Trading** The Director-General of Fair Trading has wide powers to monitor and investigate trading activities and to refer monopoly or anti-competitive situations to the Competition Commission.

**Official List (OL)** The daily list of securities admitted for trading on the London Stock Exchange. It does not include securities traded on the Alternative Investment Market (AIM).

**Offshore investment** Outside of UK jurisdiction and financial regulation, usually in tax havens.

- Oligopoly** A small number of producers in an industry.
- Onshore fund** A fund authorized and regulated by the regulator in the investor's home country.
- Open-ended funds** The size of the fund and the number of units depends on the amount investors wish to put into the fund.
- Open interest** The sum of outstanding long and short positions in a given futures or option contract.
- Open offer** New shares are sold to a wide range of external investors (not existing shareholders). However, under claw back provisions existing shareholders can buy the shares at the offer price if they wish.
- Open outcry** Where trading is through oral calling of buy and sell offers by market members.
- Open-ended investment companies (OEIC)** Collective investment vehicles with one price for investors. OEICs are able to issue more shares if demand increases from investors, unlike investment trusts. OEICs invest the finance raised in securities, primarily shares.
- Operating gearing** *See* Gearing.
- Operating lease** The lease period is significantly less than the expected useful life of the asset.
- Operating margin** *See* Operating profit margin.
- Operating profit (operating income)** The income remaining after paying all costs other than interest.
- Operating profit margin (operating margin, trading margin)** Operating profit as a percentage of sales.
- Operational efficiency of a market** The cost to buyers and sellers of transactions in securities on the exchange.
- Opportunity cost** The value forgone by opting for one course of action; the next best use of, say, financial resources.
- Opportunity cost of capital** The return that is sacrificed by investing finance in one way rather than investing in an alternative of the same risk class, e.g. financial security.
- Option** A contract giving one party the right, but not the obligation, to buy or sell a financial instrument, commodity or some other underlying asset at a given price, at or before a specified date.
- Option premium** The amount paid by an option purchaser (holder) to obtain the rights under an option contract.
- Order book system** *See* Order-driven trading system.
- Order-driven trading system** Buy and sell orders for securities are entered on a central computer system, and investors are automatically matched according to the price and volume they entered (also called matched bargain systems) – SETS is an example.
- Ordinary resources** Those that give the firm competitive parity. They provide a threshold competence.

**Ordinary shares** The equity capital of the firm. The holders of ordinary shares are the owners and are therefore entitled to all distributed profits after the holders of debentures and preference shares have had their claims met.

**Organic growth** Growth from within the firm rather than through mergers.

**Out-of-the-money option** An option with no intrinsic value. For a call option the current price of the underlying is less than the exercise price. For a put option the current price of the underlying is more than the exercise price.

**Over-allotment issue** Same as Greenshoe.

**Over-capacity** An industry or company has significantly more capacity to supply product than is being demanded.

**Overdraft** A permit to overdraw on an account (e.g. a bank account) up to a stated limit; to take more out of a bank account than it contains.

**Overhang** Share price is depressed because of an anticipated sale of a large block of shares.

**Overhead** The business expenses not chargeable to a particular part of the work or product.

**Oversubscription** In a new issue of securities investors offer to buy more securities (e.g. shares) than are made available.

**Over-the-counter trade (OTC)** Securities trading carried on outside regulated exchanges. Allows tailor-made transactions.

**Overtrading** When a business has insufficient finance to sustain its level of trading. A business is said to be overtrading when it tries to engage in more business than the investment in working capital will allow. This can happen even in profitable circumstances.

**Owner earnings** Reported earnings plus depreciation, depletion, amortization and certain other non-cash charges less the amount of expenditure for plant and machinery and working capital, etc. that a business requires to fully maintain its long-term competitive position, its unit volume and invest in value generating opportunities.

**PacMan defense** In a hostile merger situation the target makes a counter bid for the bidder.

**Par value (nominal or face value)** A stated nominal value of a share or bond. Not related to market value.

**Partnership** An unincorporated business formed by the association of two or more persons who share the risk and profits.

**Parent company (holding company)** The one that partially or wholly owns other companies.

**Pathfinder prospectus** In a new issue of shares a detailed report on the company is prepared and made available to potential investors a few days before the issue price is announced.

**Payback** The period of time it takes to recover the initial cost of a project.

**Payout ratio** The percentage of after-tax profit paid to shareholders in dividends.



**Pecking order theory of financial gearing** Firms exhibit preferences in terms of sources of finance. The most acceptable source of finance is retained earnings, followed by borrowing and then by new equity issues.

**Pension funds** These manage money on behalf of members to provide a pension upon the member's retirement. Most funds invest heavily in shares.

**Pension holiday** When a pension fund does not need additional contributions for a time, it may grant the contributors, e.g. companies and/or members, a break from making payments.

**Perfect competition (perfect market)** Entry to the industry is free and the existing firms have no bargaining power over suppliers or customers. Rivalry between existing firms is fierce because products are identical. The following assumptions hold:

- (a) there is a large number of buyers;
- (b) there is a large number of sellers;
- (c) the quantity of goods bought by any individual transaction is so small relative to the total quantity traded that individual trades leave the market price unaffected;
- (d) the units of goods sold by different sellers are the same – the product is homogeneous;
- (e) there is perfect information – all buyers and all sellers have complete information on the prices being asked and offered in other parts of the market; and
- (f) perfect freedom of exit from the market.

**Perfect hedge** Eliminates risk.

**Perfect market** *See* Perfect competition.

**Performance spread** The percentage difference between the actual rate of return on an investment and the required rate given its risk class.

**Perpetuity** A regular sum of money received at intervals forever.

**Personal equity plan (PEP)** Personal investment vehicle with tax advantages. Directed mostly to encourage investment in quoted shares.

**Physical delivery** Settlement of a futures contract by delivery of the underlying.

**Placing** A method of selling shares and other financial securities in the primary market. Securities are offered to the sponsors' or brokers' private clients and/or a narrow group of institutions.

**Planning horizon** The point in the future after which an investment will earn only the minimum acceptable rate of return.

**Plc** Public limited company.

**Poison pills** Actions taken, or which will be taken, which make a firm unpalatable to a hostile acquirer.

**Political risk** Changes in government or government policies impacting on returns and volatility of returns.

**Pooled funds** Organizations (e.g. unit trusts) that gather together numerous small quantities of money from investors and then invest in a wide range of financial securities.

- Portfolio** A collection of investments.
- Portfolio investment** Investments made in other countries in bonds and shares. An alternative form of foreign investment is direct investment, buying commercial assets such as factory premises and industrial plant.
- Portfolio optimizer** A computer program designed to select an optimal portfolio in terms of risk and return.
- Portfolio theory** Formal mathematical model for calculating risk returns trade-offs as securities are combined is a portfolio.
- Portfolio planning** Allocating resources to those SBUs and product/customer areas offering the greatest value creation, while withdrawing capital from those destroying value.
- Post-completion audit** The monitoring and evaluation of the progress of a capital investment project through a comparison of the actual cash flows and other benefits with those forecast at the time of authorization.
- Pre-emption rights** The strong right of shareholders of UK companies to subscribe for further issues of shares. *See* Rights issue.
- Preference share** These normally entitle the holder to a fixed rate of dividend but this is not guaranteed. Holders of preference shares precede the holders of ordinary shares, but follow bond holders and other lenders in payment of dividends and return of principal. *Participating preference share*: share in residual profits. *Cumulative preference share*: share carries forward the right to preferential dividends should it be missed for a year(s). *Redeemable preference share*: a preference share with a finite life. *Convertible preference share*: may be converted into ordinary shares.
- Preferred ordinary shares** Rank higher than deferred ordinary shares for an agreed rate of dividend.
- Preliminary annual results, Preliminary profit announcements (prelims)** After the year-end and before the full reports and accounts are published, a statement on the profit for the year and other information is provided by companies quoted on the London Stock Exchange.
- Premium (on an option)** The amount paid to an option writer to obtain the right to buy or sell the underlying.
- Present value** Future cash flow is discounted to time zero.
- Pre-tax margin** *See* Pre-tax profit margin.
- Pre-tax profit** Profit on ordinary activities before deducting taxation.
- Pre-tax profit margin (pre-tax margin)** Profit after all expenses including interest expressed as a percentage of sales.
- Price discovery** The process of forming prices through the interaction of numerous buy and sell orders in an exchange.
- Preservation approach to merger integration** Little is changed in the acquired firm in terms of culture, systems or personnel. General management skills might be transferred from the parent along with strict financial performance yardsticks and demanding incentive schemes.
- Press** Collective name for newspapers and periodicals.

- Price-earnings ratio (PER)** Share price divided by earnings per share.  
*Historic PER:* Share price divided by most recently reported annual earnings per share.  
*Forward (prospective) PER:* Share price divided by anticipated annual earnings per share.
- Price-earnings ratio game (bootstrapping)** Companies increase earnings per share by acquiring other companies with lower price-earnings ratios than themselves. Share price can rise despite the absence of economic value gain.
- Price-sensitive information** That which may influence the share price or trading in the shares.
- Price to book ratio (market to book)** The price of a share as a multiple of per share book (balance sheet) value.
- Pricing power** An ability to raise prices even when product demand is flat without the danger of losing significant volume or market share.
- Primary investors** The household sector contains the savers in society who are the main providers of funds used for investment in the business sector.
- Primary market** A market in which securities are initially issued.
- Principal** (a) The capital amount of a debt, excluding any interest. (b) A person acting for their own purposes accepting risk in financial transactions, rather than someone acting as an agent for another.
- Principal-agent problem** In which an agent, e.g. a manager, does not act in the best interests of the principal, e.g. the shareholder.
- Private equity** Share capital invested in companies not quoted on an exchange.
- Private limited company (Ltd)** A company which is unable to offer its shares to the wider public.
- Privatization** The sale to private investors of government-owned equity (shares) in nationalized industries or other commercial enterprises.
- Profitability index** A measure of present value per pound invested.
- Profit and loss account** Records whether a company's sales revenue was greater than its costs.
- Profit margin** Profits as a percentage of sales.
- Pro forma earnings** Projected or forecast earnings. These are not audited and may be unreliable.
- Project appraisal** The assessment of the viability of proposed long-term investments in real assets within the firm.
- Project finance** Finance assembled for a specific project. The loan and equity returns are tied to the cash flows and fortunes of the project rather than being dependent on the parent company/companies.
- Promissory note** A borrower issues a note containing a promise to pay a sum of money on the redemption date. It will be sold at a discount prior to the redemption date.
- Proprietary transactions** A financial institution, as well as acting as an agent for a client, may trade on the financial markets with a view to generating profits for itself, e.g. speculation on forex.

**Prospectus** A document containing information about a company (unit trust/OEIC), to assist with a new issue (initial public offering) by supplying detail about the company and how it operates.

**Provision** Sum set aside in accounts for anticipated loss or expenditure.

**Proxy votes** Shareholders unable to attend a shareholders' meeting may authorize another person, e.g. a director or the chairman, to vote on their behalf, either as instructed or as that person sees fit.

**Public limited company (Plc)** A company which may have an unlimited number of shareholders and offer its shares to the wider public (unlike a limited company). Must have a minimum share value of £50,000. Some Plcs are listed on the London Stock Exchange.

**Purchasing power parity (PPP) theory of exchange rate determination** Exchange rates will be in equilibrium when their domestic purchasing powers at that rate of exchange are equivalent.

**Put option** This gives the purchaser the right, but not the obligation, to sell a financial instrument, commodity or some other underlying asset at a given price, at or before a specified date.

**Quota** Quantitative limits placed on the importation of specified goods.

**Quick asset value (net)** Current assets minus inventory stock minus current liabilities.

**Quick ratio (acid test)** The ratio of current assets, less stock, to total current liabilities.

**Quoted** Those shares with a price quoted on a recognized investment exchange, RIE (e.g. the Official list of the London Stock Exchange).

**Quote-driven trading system** Marketmakers post bid and offer prices on a computerized system.

**Random walk theory** The movements in (share) prices are independent of one another; one day's price change cannot be predicted by looking at the previous day's price change.

**Ranking (debt)** Order of precedence for payment of obligations. Senior debt receives annual interest and redemption payments ahead of junior (or subordinated) debt. So, if the company has insufficient resources to pay its obligation the junior debt holders may receive little or nothing.

**Rappaport's value drivers** The seven key factors which determine value are: (1) Sales growth rate. (2) Operating profit margin. (3) Tax rate. (4) Incremental fixed capital investment. (5) Incremental working capital investment. (6) The planning horizon. (7) The required rate of return.

**Raw materials stock period** The average number of days raw materials remain unchanged and in stock. Equal to the average value of raw materials stock divided by the average purchase of raw materials per day.

**Real assets** Assets used to carry on a business. These assets can be tangible or intangible.

**Real cash flows** Future cash flows are expressed in terms of constant purchasing power.

- Real option** An option to undertake different courses of action in the real asset market (strategic and operational options), as opposed to an option on financial securities or commodities.
- Real rate of return** The rate that would be required in the absence of inflation.
- Recapitalization** A change in the financial structure, e.g. in debt/equity ratio.
- Receiver** A receiver takes control of a business if a debtor successfully files a bankruptcy petition. The receiver may then sell the company's assets and distribute the proceeds among the creditors.
- Recognized investment exchange (RIE)** A body authorized to regulate securities trading in the UK, e.g. the London Stock Exchange.
- Recourse** If a financial asset is sold (such as a trade debt), the purchaser could return to the vendor for payment in the event of non-payment by the borrower.
- Redemption** The repayment of the principal amount, or par value, of a security (e.g. bond) at the maturity date.
- Redemption yield** *See* Yield.
- Registrar** An organization that maintains a record of share ownership for a company. It also communicates with shareholders on behalf of the company.
- Regulatory News Service (RNS)** A system for distributing important company announcements and other price-sensitive financial news run by the London Stock Exchange.
- Relationship banking** A long-term, intimate and relatively open relationship is established between a corporation and its banks. Banks often supply a range of tailor-made services rather than one-off services.
- Rembrandt** A foreign bond issued in The Netherlands.
- Repayment holiday** *See* Grace period.
- Rescheduling** Rearranging the payments made by a borrower to a lender – usually over a long period.
- Residual theory of dividends** Dividends should only be paid when the firm has financed all its positive NPV projects.
- Resistance line** A line drawn on a price (e.g. share) chart showing the market participants' reluctance to push the price below (or above) the line over a period of time.
- Resolution** A proposal put to the vote at a shareholders' meeting.
- Resolution of uncertainty theory of dividends** The market places a greater value on shares offering higher near-term dividends because these are more certain than more distant dividends.
- Restructuring costs** The costs associated with a reorganization of the business, e.g. closing factories, redundancies.
- Retail banking** Banking for individual customers or small firms, normally for small amounts. High-volume/low-value banking.
- Retail Service Providers (RSPs)** Some market makers also offer automated computer dealing service to investors as RSPs – *see* Real time dealing.
- Retention ratio** Retained profits for the year as a proportion of profits after tax attributable to ordinary shareholders for the year.

- Return on capital employed (ROCE); return on investment (ROI)** Traditional measures of profitability. Profit return divided by the volume of resources devoted to the activity. Resources usually includes shareholders funds, net debt and provisions. Cumulative goodwill, previously written off, may be added back to the resources total. *See also* Accounting rate of return.
- Return on equity (ROE)** Profit attributable to shareholders as a percentage of equity shareholders funds.
- Revaluation reserve** A balance sheet entry that records accumulated revaluations of fixed assets.
- Reverse floating rate notes** *See* Floating rate notes.
- Revolving credit** An arrangement whereby a borrower can draw down short-term loans as the need arises, to a maximum over a period of years.
- Revolving underwriting facility (RUF)** A bank underwrites the borrower's access to funds at a specified rate in the short-term financial markets throughout an agreed period.
- Reward-to-variability ratio** Alternative name for Sharpe ratio.
- Reward-to-volatility ratio** An alternative name for Treynor's ratio.
- Rights issue** An invitation to existing shareholders to purchase additional shares in the company in proportion to their existing holdings.
- Risk** A future return has a variety of possible values. Sometimes measured by standard deviation.
- Risk averter** Someone who prefers a more certain return to an alternative with an equal return but which is more risky.
- Risk lover (seeker)** Someone who prefers a more uncertain alternative to an alternative with an equal but less risky outcome.
- Risk management** The selection of those risks a business should take and those which should be avoided or mitigated, followed by action to avoid or reduce risk.
- Risk transformation** Intermediaries offer low-risk securities to primary investors to attract funds, which are then used to purchase higher-risk securities issued by the ultimate borrowers.
- Risk-free rate of return (RFR)** The rate earned on riskless investment, denoted  $r_f$ . A reasonable proxy is the lending rate to a reputable government.
- Risk-return line** A line on a two-dimensional graph showing all the possible expected returns, i.e. standard deviation combinations, available from the construction of portfolios from two assets. This can also be called the two-asset opportunity set or feasibility set.
- Roadshow** Companies and their advisers make a series of presentations to potential investors, usually to entice them into buying a new issue of securities.
- Rolled-over overdraft** Short-term loan facilities are perpetuated into the medium term and long term by the regular renewal of the facility.
- Rolling settlement** Shares and cash are exchanged after a deal had been struck a fixed number of days later – usually after three days – rather than on a specific account day.

**RPI (retail price index)** The main UK measure of general inflation.

**R-squared,  $R^2$**  *See* Coefficient of determination.

**Running yield** *See* Yield.

**Safe haven** Investing in a safe secure investment in time of trouble, such as major financial turmoil. UK or US government bonds and Treasury bills are usually regarded as safe havens.

**Sale and leaseback** Assets (e.g. land and buildings) are sold to another firm (e.g. bank, insurance company) with a simultaneous agreement for the vendor to lease the asset back for a stated period under specific terms.

**Sales ledger administration** The management of trade debtors: recording credit sales, checking customer creditworthiness, sending invoices and chasing late payers.

**Samurai bonds** A foreign bond issued in Japan.

**S&P 500** Standard and Poor's index of 500 leading US shares.

**Satisfied** When a contributor to an organization is given just enough of a return to make their contribution, e.g. banks are given contracted interest and principal, and no more.

**Scaledown** In a new issue, when a company floats on a stock exchange, if demand is greater than supply at the offer price the applicants receive less than what they applied for.

**Scenario analysis** An analysis of the change in NPV brought about by the simultaneous change in a number of key inputs to an NPV analysis. Typically a 'worst case scenario', when all the changes in variables are worsening, and a 'best case scenario', when all the variable changes are positive, are calculated.

**Scrip dividends** Shareholders are offered the alternative of additional shares rather than a cash dividend.

**Scrip issue** The issue of more shares to existing shareholders according to their current holdings.

**SEAQ (Stock Exchange Automated Quotation System)** A computer screen-based quotation system for securities where marketmakers on the London Stock Exchange report bid-offer prices and trading volumes, and brokers can observe prices and trades.

**SEAQI (Stock Exchange Automated Quotation International)** A computer screen-based quotation system for securities that allows marketmakers in international shares based on the London Stock Exchange to report prices, quotes and trading volumes.

**Seasoned Equity Offerings (SEOs)** Companies that have been on a stock exchange for some time selling new shares, e.g. via a rights issue.

**SEATS plus (Stock Exchange Alternative Trading Service)** A London Stock Exchange system for trading less liquid securities where there is either a single, or no, marketmaker. Displays marketmaker prices and/or current public orders.

**Secondary market** Securities already issued are traded between investors.

- Securities and Exchange Commission (SEC)** The US federal body responsible for the regulation of securities markets (exchanges, brokers, investment advisers, etc.).
- Securities house** This may mean simply an issuing house. However, the term is sometimes used more broadly for an institute concerned with buying and selling securities or acting as agent in the buying and selling of securities.
- Securitization** Financial payments (e.g. a claim to a number of mortgage payments) which are not tradeable can be repackaged into other securities (e.g. a bond) and then sold. These are called asset-backed securities.
- Security** (1) A financial asset, e.g. a share or bond. (2) Asset pledged to be surrendered in the event of a loan default.
- Security market line (SML)** A linear (straight) line showing the relationship between systematic risk and expected rates of return for individual assets (securities). According to the capital asset pricing model the return above the risk-free rate of return for a risky asset is equal to the risk premium for the market portfolio multiplied by the beta coefficient.
- SEDOL** Stock Exchange Daily Official List. A journal published daily giving prices and deals for shares on London's Official List.
- Seedcorn capital** The financing of the development of a business concept. High risk; usually provided by venture capitalists, entrepreneurs or business angels.
- Self-regulation** Much of the regulation of financial services in the UK is carried out by self-regulatory organizations (SROs), i.e. industry participants regulate themselves within a light-touch legislated framework.
- Semi-annual** Twice a year at regular intervals.
- Semi-strong efficiency** Share prices fully reflect all the relevant, publicly available information.
- Senior debt** *See* Subordinated debt.
- Sensitivity analysis** An analysis of the effect on project NPV of changes in the assumed values of key variables, e.g. sales level, labour costs. Variables are changed one at a time. It is a 'what-if' analysis, e.g. what if raw material costs rise by 20 percent?
- Serious Fraud Office (SFO)** Investigates and prosecutes crimes of serious fraud in the UK.
- Sequence** A computerized share trading platform introduced by the London Stock Exchange in 1996.
- SETS (Stock Exchange Electronic Trading Service)** An electronic order book-based trading system for the London Stock Exchange. Brokers input buy and sell orders directly into the system. Buyers and sellers are matched and the trade executed automatically. The system was used for the largest UK shares and the Stock Exchange plans to increase the number of shares on SETS – eventually SEAQ might be completely replaced.
- Settlement** The completion of a transaction, e.g. upon expiry of a future, the underlying is delivered in return for a cash payment.
- Settlement price** The price calculated by a derivatives exchange at the end of each trading session as the closing price that will be used in determining profits and losses for the marking-to-market process for margin accounts.



**Share** Companies divide the ownership of the company into ordinary shares. An owner of a share usually has the same rights to vote and receive dividends as another owner of a share.

**Share buy-back** The company buys back a proportion of its shares from shareholders.

**Share certificate** A document showing ownership of part of the share capital of a company.

**Share market** Institutions which facilitate the regulated sale and purchase of shares; includes the primary and secondary markets.

**Share option scheme** Employees are offered the right to buy shares in their company at a modest price some time in the future.

**Share premium account** A balance sheet entry represented by the difference between the price received by a company when it sells shares and the par value of those shares.

**Share repurchase** The company buys back its own shares.

**Share split (stock split)** Shareholders receive additional shares from the company. The nominal value of each share is reduced in proportion to the increase in the number of shares, so the total book value of shares remains the same.

**Shareholders' funds** The net assets of the business (after deduction of all short- and long-term liabilities and minority interests) shown in the balance sheet.

**Shareholder value analysis** A technique developed by Rappaport for establishing value creation. It equals the present value of operating cash flows within the planning horizon *plus* the present value of operating cash flows after the planning horizon *plus* the current value of marketable securities and other non-operating investments less corporate debt.

**Shareholder wealth maximization** The maximizing of shareholders' purchasing power. In an efficient market, it is the maximization of the current share price.

**Sharpe ratio** A measure relating risk and return. The extent to which a portfolio's (or share's) return has been greater than a risk-free asset divided by its standard deviation.

**Shell company** A company with a stockmarket quotation but with very little in the way of real economic activity. It may have cash but no production.

**Short position** In a derivative contract the counterparty in a short position is the one that has agreed to deliver the underlying.

**Short selling** The selling of financial securities (e.g. shares) not yet owned, in the anticipation of being able to buy at a later date at a lower price.

**Short-term interest rate future** (colloquially known as **short sterling**) The three-month sterling interest rate future contract traded on LIFFE. Notional fixed-term deposits for three-month periods starting at a specified time in the future.

**Short-termism** A charge leveled at the financial institutions in their expectations of the companies to which they provide finance. It is argued that long-term benefits are lost because of pressure for short-term performance.

**Shorting** Same as Short Selling.

**Shorts** UK government bonds (gilts) with less than five years to maturity.

- Sight bank account (current account)** One where deposits can be withdrawn without notice.
- Sigma** A measure of dispersion of returns, standard deviation.
- Signaling** Some financial decisions are taken as signals from the managers to the financial markets, e.g. an increase in gearing, or a change in dividend policy.
- Simple interest** Interest is paid on the original principal: no interest is paid on the accumulated interest payments.
- Sinking fund** Money is accumulated in a fund through regular payments in order eventually to repay a debt.
- Small firm effect** The tendency of small firms to give abnormally high returns.
- Soft capital rationing** Internal management-imposed limits on investment expenditure.
- Solvency** The ability to pay legal debts.
- South Sea Bubble** A financial bubble (*see* Bubble) in which the price of shares in the South Sea Company were pushed to ridiculously high levels on a surge of over-optimism in the early eighteenth century.
- Special dividend** An exceptionally large dividend paid on a one-off basis.
- Special purpose entity** Companies set these up as separate organizations for a particular purpose. They are designed so that their accounts are not consolidated with the rest of the group.
- Special resolution** A company's shareholders vote at a AGM or EGM with a majority of 75 percent of those voting. Normally special resolution are reserved for important changes in the constitution of the company. Other matters are dealt with by way of ordinary resolution (50 percent or more of the votes required).
- Specific inflation** The price changes in an individual good or service.
- Special drawing rights (SDRs)** A composite currency designed by the International Monetary Fund (IMF). Each IMF member country is allocated SDRs in proportion to its quota.
- Specific inflation** The price changes in an individual good or service.
- Speculative motive for holding cash** This means that unexpected opportunities can be taken immediately.
- Speculators** Those that take a position in financial instruments and other assets with a view to obtaining a profit on changes in their value.
- Sponsor** Lends its reputation to a new issue of securities, advises the client company (along with the issuing broker) and co-ordinates the new issue process. Sponsors are usually merchant banks or stockbrokers. Also called an issuing house.
- Spot market** A market for immediate transactions (e.g. spot forex market, spot interest market), as opposed to an agreement to make a transaction some time in the future (e.g. forward, option, future).
- Spread** The difference between the price to buy and the price to sell a financial security. Market makers quote a bid-offer spread for shares. The lower price (bid) is the price an investor receives if selling to the market maker. The higher (offer) price is the price if the investor wishes to buy from the market maker.
- Stakeholder** A party with an interest in an organization, e.g. employees, customers, suppliers, the local community.

**Standard and Poors 500 (S & P 500)** An index of US shares.

**Standard deviation** A statistical measure of the dispersion around an average. A measure of volatility. The standard deviation is the square root of the variance. A fund or a share can be expected to fall within one standard deviation of its average two-thirds of the time if the future is like the past.

**Start-up capital** Finance for young companies which have not yet sold their product commercially. High risk; usually provided by venture capitalists, entrepreneurs or business angels.

**Statutory** Established, regulated or imposed by or in conformity with laws passed by a legislative body, e.g. Parliament.

**Sterling bonds** Corporate bonds which pay interest and principal in sterling.

**Stock** Another term for inventory of raw materials, work-in-progress and finished items.

**Stocks and shares** There is some lack of clarity on the distinction between stocks and shares. Shares are equities in companies. Stocks are financial instruments that pay interest, e.g. bonds. However, in the USA shares are also called 'common stocks' and the shareholders are sometimes referred to as the stockholders. So when some people use the term stocks they could be referring to either bonds or shares.

**Stock exchange** A market in which securities are bought and sold. In continental Europe the term bourse may be used.

**Stock Exchange Automated Quotations** See SEAQ.

**Stock market** See Stock Exchange.

**Stock-out costs** The cost associated with being unable to draw on a stock of raw material, work-in-progress or finished goods inventory (loss of sales, profits and goodwill, and also production dislocation).

**Straight bond** One with a regular fixed rate of interest and without the right of conversion (to, say, shares).

**Strategic business unit (SBU)** A business unit within the overall corporate entity which is distinguishable from other business units because it serves a defined external market where management can conduct strategic planning in relation to products and markets.

**Strategic analysis** The analysis of industries served by the firm and the company's competitive position within the industry.

**Strategy** Selecting which product or market areas to enter/exit and how to ensure a good competitive position in those markets/products.

**Strategy planes chart** Maps a firm's, SBU's or product line's position in terms of industry attractiveness, competitive advantage and life-cycle stage of value potential.

**Strike price** (1) In the offer for sale by a tender it is the price which is chosen to sell the required quantity of shares given the offers made. (2) The price paid by the holder of an option when/if the option is exercised. *See* Exercise price.

**Strong form efficiency** All relevant information, including that which is privately held, is reflected in the share price.

**Subjective probability** Probabilities are devised based on personal judgment of the range of outcomes along with the likelihood of their occurrence.

**Subordinated debt** A debt which ranks below another liability in order of priority for payment of interest or principal. Senior debt ranks above junior debt for payment.

**Subsidiary** A company is a subsidiary of another company if the parent company holds the majority of the voting rights, or has a minority of the shares but has the right to appoint or remove directors holding a majority of the voting rights at meetings of the board on all, or substantially all, matters or it has the right to exercise a dominant influence.

**Subscription rights** A right to subscribe for some shares.

**Summary financial statement** Companies often send small investors a summary of the financial statements rather than the full report and accounts. This suits many investors and saves the company some money. However, an investor is entitled to receive a full annual report and accounts. It may be necessary to make a request for this.

**Sunk cost** A cost the firm has incurred or to which it is committed that cannot be altered. This cost does not influence subsequent decisions and can be ignored in, for example, project appraisals.

**Super normal returns** A rate of return above the normal rate.

**Survivorship bias** In empirical studies of share price performance the results may be distorted by focussing only on companies which survived through to the end of the period of study. Particularly poor performers (i.e. liquidated firms) are removed from the sample, thus biasing the results in a positive direction.

**Swap** An exchange of cash payment obligations. An interest rate swap is where one company arranges with a counterparty to exchange interest rate payments. In a currency swap the two parties exchange interest obligations (receipts) for an agreed period between two different currencies.

**Swaption** An option to have a swap at a later date.

**Symbiosis type of post-merger integration** Large differences between acquired and parent firms in culture, systems, etc. are maintained. However, collaboration in communications and the cross-fertilization of ideas are encouraged.

**Syndicated loan** A loan made by one or more banks to one borrower.

**Synergy** A combined entity (eg. two companies merging) will have a value greater than the sum of the parts.

**Systematic (undiversifiable or market) risk** That element of return variability from an asset which cannot be eliminated through diversification. Measured by beta. It comprises the risk factors common to all firms.

**Takeover (acquisition)** Many people use these terms interchangeably with merger. However, some differentiate takeover as meaning a purchase of one firm by another with the concomitant implication of financial and managerial domination.

**Takeover Panel** The committee responsible for supervising compliance with the City Code on Takeovers and Mergers.

**Tangible assets** Those that have a physical presence.

**Tariff** Taxes imposed on imports.

**Tax allowance** An amount of income or capital gain that is not taxed.

**Tax avoidance** Steps taken to reduce tax that are permitted under the law.

**Tax evasion** Deliberately giving a false statement or omitting a relevant fact.

**Tax haven** A country or place with low rates of tax.

**Taxable profit** That element of profit subject to taxation. This frequently differs from reported profit.

**techMARK** The London Stock Exchange launched techMARK in 1999. It is a subsection of the shares within the Official List. It is a grouping of technology companies. It imposes different rules on companies seeking a flotation from those which apply to the other companies on the Official List (e.g. only one year's accounts is required).

**Tender offer** A public offer to purchase securities.

**Term loan** A loan of a fixed amount for an agreed time and on specified terms, usually with regular periodic payments. Most frequently provided by banks.

**Term structure of interest rates** The patterns of interest rates on bonds with differing lengths of time to maturity but with the same risk. Strictly it is the zero-coupon implied interest rate for different lengths of time. *See also* Yield curve.

**Terminal value** The forecast future value of sums of money compounded to the end of a common time horizon.

**Tick** The minimum price movement of a future or option contract.

**Tier one ratio of core capital** That part of a bank's capital defined as shareholders' equity plus irredeemable and non-cumulative preference shares.

**Tiger economies** The first four newly industrialized economies in Asia: Taiwan, South Korea, Singapore and Hong Kong (also referred to as dragon economies).

**Time value** That part of an option's value that represents the value of the option expiring in the future rather than now. The longer the period to expiry, the greater the chance that the option will become in-the-money before the expiry date. The amount by which the option premium exceeds the intrinsic value.

**Time value of money** A pound received in the future is worth less than a pound received today – the value of a sum of money depends on the date of its receipt.

**Total shareholder return (TSR)** The total return earned on a share over a period of time: dividends per share plus capital gain divided by initial share price.

**Trade credit** Where goods and services are delivered to a firm for use in its production and are not paid for immediately.

**Trade debtor** A customer of a firm who has not yet paid for goods and services delivered.

**Trading floor** A place where traders in a market (or their representatives) can meet to agree transactions face to face. However investment banks often have 'trading floors' where they 'meet' counterparties on other trading floors to conduct transactions via the telephone or computer.

**Trading margin** *See* Operating profit margin.

- Traditional option** An option available on a security with an exercise price fixed as the market price on the day the option is bought. All such options expire after three months and cannot be sold to a secondary investor.
- Transaction risk** The risk that transactions already entered into, or for which the firm is likely to have a commitment in a foreign currency, will have a variable value in the home currency because of exchange rate movements.
- Transactional banking** Banks compete with each other to offer services at the lowest cost to corporations, on a service-by-service basis.
- Transactional motive for holding cash** Money is used as a means of exchange; receipts and payments are rarely perfectly synchronized and therefore an individual or business generally needs to hold a stock of money to meet expenditure.
- Translation risk** This risk arises because financial data denominated in one currency are then expressed in terms of another currency.
- Treasury** UK government department responsible for financial and economic policy.
- Treasury bill** A short-term money market instrument issued (sold) by the central bank, mainly in the UK and USA, usually to supply the government's short-term financing needs.
- Treasury management** To plan, organize and control cash and borrowings so as to optimize interest and currency flows, and minimize the cost of funds. Also to plan and execute communications programs to enhance investors' confidence in the firm.
- Treynor's ratio** A measure relating return to risk. It is the return on a portfolio (or share) minus the risk-free rate of rate of return divided by beta.
- TRRACK system** A system to assist the analysis of a company's extraordinary resources under the headings: tangible; relationships; reputation; attitude; capabilities; and knowledge.
- Trust deed** A document specifying the regulation of the management of assets on behalf of beneficiaries of the trust.
- Trustees** Those that are charged with the responsibility for ensuring compliance with the trust deed.
- Tulipmania** A seventeenth-century Dutch bubble. *See* Bubble.
- Ultimate borrowers** Firms investing in real assets need finance which ultimately comes from the primary investors.
- Uncertainty** Strictly (in economists' terms), uncertainty is when there is more than one possible outcome to a course of action; the form of each possible outcome is known, but the probability of getting any one outcome is not known. However, the distinction between risk (the ability to assign probabilities) and uncertainty has largely been ignored for the purposes of this text.
- Unconditionality** In a merger, once unconditionality is declared, the acquirer becomes obligated to buy. Target shareholders who accepted the offer are no longer able to withdraw their acceptance.
- Uncovered (naked) call option writing** Writing a call option on an underlying when the writer does not own the underlying securities included in the option.

**Unconventional cash flows** A series of cash flows in which there is more than one change in sign – more than one switch from inflows to outflows or outflows to inflows.

**Underlying** The subject of a derivative contract.

**Underlying earnings per share** *See* Headline earnings per share.

**Underwriters** These (usually large financial institutions) guarantee to buy the proportion of a new issue of securities (e.g. shares) not taken up by the market, in return for a fee.

**Undifferentiated product** One that is much the same as that supplied by other companies.

**Undiversifiable risk** *See* Systematic risk.

**Uninformed investors** Those that have no knowledge about financial securities and the fundamental evaluation of their worth.

**Unit trust** An investment organization that attracts funds from individual investors by issuing units to invest in a range of securities, e.g. shares or bonds. It is open ended, the number of units expanding to meet demand.

**United Kingdom Listing Authority (UKLA)** This organization is part of the Financial Services Authority and rigorously enforces a set of demanding rules on companies joining the stock market and in subsequent years.

**Universal banks** Financial institutions involved in many different aspects of finance including retail banking and wholesale banking.

**Unlisted** Shares and other securities not on the Official List of the London Stock Exchange are described as unlisted.

**Unlisted Securities Market (USM)** A lower-tier (less stringently regulated) market for shares in London, which ceased in 1996.

**Unquoted** Those shares with a price not quoted on a recognized investment exchange, RIE (e.g. the Official List or AIM of the London Stock Exchange).

**Unsecured** A financial claim with no collateral or any charge over assets of the borrower.

**Unsystematic (unique or diversifiable) risk** That element of an asset's variability in returns which can be eliminated by holding a well-diversified portfolio.

**Utility** The satisfaction, pleasure or fulfilment of needs derived from consuming some quantity of a good or service.

**Valuation risk (price risk)** The possibility that, when a financial instrument matures or is sold in the market, the amount received is less than anticipated by the lender.

**Value action pentagon** This displays the five actions for creating value: (1) Increase the return on existing capital. (2) Raise investment in positive spread units. (3) Divest assets from negative spread units to release capital for more productive use. (4) Extend the planning horizon. (5) Lower the required rate of return.

**Value chain** The interlinking activities that take place within an organization or between organizations in the process of converting its inputs into its outputs. Identifying these activities and finding ways to perform them more efficiently is a way for companies to gain competitive advantage over their rivals.

- Value creation: four key elements** The four key elements are: (1) Amount of capital invested. (2) Actual rate of return on capital. (3) Required rate of return. (4) Planning horizon (for performance-spread persistence).
- Value creation profile** An analysis of the sources of value creation within the firm from its products and market segments, which maps value creation against the proportion of capital invested.
- Value creation quotient (VCQ)** An external value metric developed by Rory Knight. The market value of equity and the balance sheet value of debt divided by the cumulative capital raised and retained (debt plus equity).
- Value drivers** Crucial organizational capabilities, giving the firm competitive advantage. Different from Rappaport value drivers.
- Value investing** The identification and holding of shares which are fundamentally undervalued by the market, given the prospects of the firm.
- Value-based management** A managerial approach in which the primary purpose is long-term shareholder wealth maximization. The objective of the firm, its systems, strategy, processes, analytical techniques, performance measurements and culture, have as their guiding objective long-term shareholder wealth maximization.
- Vanilla bond** *See* Straight bond.
- Variable costs** Costs that rise or fall with company output and sales.
- Variable rate bond (loan)** The interest rate payable varies with short-term rates (e.g. LIBOR six months).
- Variance** A measure of volatility around an average value. It is the square of the standard deviation.
- Variation margin** The amount of money paid after the payment of the initial margin required to secure an option or futures position, after it has been revalued by the exchange or clearing house.
- Vendor placing** Shares issued to a company to pay for assets, or issued to shareholders to pay for an entire company in a takeover are placed with investors keen on holding the shares in return for cash. The vendors can then receive the cash.
- Venture and development capital investment trusts (VDCIT)** Standard investment trusts (without tax breaks) with a focus on more risky developing companies.
- Venture capital (VC)** Finance provided to unquoted firms by specialized financial institutions. This may be backing for an entrepreneur, financing a start-up or developing business, or assisting a management buyout or buy-in. Usually it is provided by a mixture of equity, loans and mezzanine finance. It is used for medium-term to long-term investment in high-risk situations.
- Venture capital trusts (VCTs)** An investment vehicle introduced to the UK in 1995 to encourage investment in small and fast-growing companies. The VCT invests in a range of small businesses. The providers of finance to the VCT are given important tax breaks.
- Vertical merger** Where the two merging firms are from different stages of the production chain.
- Virt-x** A share market operating electronically across borders. It mostly trades large Swiss company shares (it is part owned by SWX Swiss Exchange). It is a recognized Investment Exchange supervised by the FSA in the UK.



- Volatility** The speed and magnitude of price change over time, measured by standard deviation or variance.
- Volume transformation** Intermediaries gather small quantities of money from numerous savers and repackage these sums into larger bundles for investment in the business sector or elsewhere.
- Warrant** A financial instrument which gives the holder the right to subscribe for a specified number of shares or bonds at a fixed price at some time in the future.
- Weak form efficiency** Share prices fully reflect all information contained in past price movements.
- Weighted average cost of capital (WACC)** The weighted average cost of capital (the discount rate) is calculated by weighting the cost of debt and equity in proportion to their contributions to the total capital of the firm.
- Wealth added index (WAI)** A value metric devised and trademarked by Stern Stewart and Co. It measures the increase in shareholders' wealth through dividend and capital gains over a number of years after deducting the cost of equity capital, defined as the return required for shares of that risk class.
- White knight** A friendly company which makes a bid for a company that is welcome to the directors of that target company, which is the subject of a hostile takeover bid.
- Wholesale bank** *See* Investment bank.
- Wholesale financial markets** Markets available only to those dealing in large quantities. Dominated by interbank transactions.
- Winding up** The process of ending a company, selling its assets, paying its creditors and distributing the remaining cash among shareholders.
- Winner's curse** In winning a merger battle, the acquirer suffers a loss in value because it overpays.
- Withholding tax** Taxation deducted from payments to non-residents.
- Working capital** The difference between current assets and current liabilities – net current assets or net current liabilities.
- Working capital cycle** Typically, investment in raw materials, work-in-progress and finished goods is followed by sales for cash or on credit. Credit sales funds are usually collected at a later date. Investment is needed at each stage to finance current assets. The cycle may be expressed in terms of the length of time between the acquisition of raw materials and other inputs and the flow of cash from the sale of goods.
- Work-in-progress period** The number of days to convert raw materials into finished goods. Equal to the average value of work-in-progress divided by the average cost of goods sold per day.
- Write down (write off)** Companies change the recorded value of assets when they are no longer worth the previously stated value.
- Writer of an option** The seller of an option contract, granting the right but not the obligation to the purchaser.

**Writing-down allowance (WDA) (capital allowance)** Reductions in taxable profit related to a firm's capital expenditure (e.g. plant, machinery, vehicles).

**Yankee** A foreign bond issued in the USA.

**Yield** The income from a security as a proportion of its market price. The flat yield (interest yield, running yield and income yield) on a fixed interest security is the gross interest amount, divided by the current market price, expressed as a percentage. The redemption yield or yield to maturity of a bond is the discount rate such that the present value of all cash inflows from the bond (interest plus principal) is equal to the bond's current market price.

**Yield curve** A graph showing the relationship between the length of time to the maturity of a bond and the interest rate.

**Yield stock** *See* High yield shares.

**Zero cost option** A combination of option purchase and option writing. The price of the written option (premium) is the same as the price (premium) paid for the option that is purchased, so the net cost is zero.

**Zero coupon bond (preference share)** A bond that does not pay regular interest (dividend) but instead is issued at a discount (i.e. below par value) and is redeemable at par, thus offering a capital gain.



## FURTHER READING

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### Chapter 5

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Arnold, G.C. and Hatzopoulos, P.D. (2000) 'The theory-practice gap in capital budgeting: evidence from the United Kingdom', *Journal of Business Finance and Accounting*, 27(5) and (6), June/July, pp. 603–26. Discussion on the use of alternative risk adjustment methods is provided.

### Chapter 6

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*Investors Chronicle* (1997) 'A week in the markets' 18 April, p. 10. The value destruction by T & N is discussed.

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## Chapter 7

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# INDEX

- acceptance credits (bank bills of banker's acceptance) 401–2
- accounting and accounts
  - accountants, floating and 465
  - data, adjustments to 189
  - dividends, estimates of future growth of 323
  - earnings based management 126–7
  - economic profit 181, 184, 186–7
  - economic value added 189
  - leasing 395–6
  - profit maximization 12–13
  - rate of return 133, 134
- accounting rate of return (ARR) 67–70, 90, 92, 133–4, 184
- advisers 270–1, 304–5, 473–5
- agency costs 534–6
- Alternative Investment Market (AIM) 453, 473–5
- annuities 55–7, 631
- arbitrageurs 591
- asset-backed securities 444–8
- asset financing 518–19
- audits 18, 91–2, 284
  
- balance sheets
  - economic profit 186–8
  - financial risk management 542–3
  - forex risk 608, 609, 622–3
  - gearing 525
  - leasing 396–7
  - Market Value Added 207
  - net asset value 309–11
  - sale and leaseback 446
  - translation risk 622–3
  - weighted average cost of capital 237
- bank bills of banker's acceptance 401
- bank borrowing 373–81
  - administrative and legal costs 373
  - asymmetric information 374–5
  - bonds 233–5
  - collateral 375–6
  - costs 373–4
  - covenants 375
  - directors, security from 376
  - fixed and floating charges 375
  - interest rates 373–4
  - LIBOR (London Inter-Bank Offered Rate) 373
  - overdrafts 373, 376–81
  - repayments 376
  - security 374–6
  - small firms 373
- betas 113, 224–6, 229–30, 241, 245–50
- bills of exchange 399–401
- bonds
  - bearer 430
  - capped 434
  - convertible 420–4, 561
  - debentures 406
  - debt finance 405–9, 420–8
  - discounted 408
  - equity released 432
  - Eurobonds 430–41
  - floating rate debt 235
  - floating rate notes 408–9
  - foreign 430
  - government 213, 250
  - high-yield (junk) bonds 213–14, 411, 414–20
  - inflation 405
  - interest rates 405, 409
  - irredeemable 234, 408
  - loan stocks 406
  - over-the-counter market 405
  - preference shares 458
  - redemption 405, 408, 425–6, 428
  - straight, plain vanilla or bullet bonds 405, 409, 432
  - trust deeds and covenants 406–8
  - valuation 424–8
- book-building 472–3
- borrowing *see also* bank borrowing, debt capital, cost of, debt equity ratio, debt finance, loans
- brokers 465, 467, 473–5, 576, 600
- business angels (informal venture capitalists) 485–7
- business risk 511, 529
  
- calls 548–57, 573, 617, 619–20
- capital 74, 88, 90 *see also* cost of capital, debt capital, cost of, equity capital, cost of, venture capital
  - cash flow return on investment 191
  - debt finance 371
  - economic profit 182–5, 187–8
  - economic value added 189
  - expenditure budget and controls 89–92
  - gearing 523–5
  - investment decisions 81, 91
  - long-term capital management 547
  - Market to Book Ratio 196, 208
  - Market Value Added 196, 204–8

- capital (*continued*)
  - preference shares 458
  - profit maximization 15
  - sale and leaseback 446
  - shareholder value 140–1
- capital asset pricing model (CAPM) 540–3
  - betas 224–5, 229–30, 245–8, 250
  - capital, cost of 245–8
  - equity capital, cost of 224–6, 228–30, 245, 250
  - security market line 225–6
  - Wealth Added Index 204
  - weighted average cost of capital 239, 241
- caps 584–6
- cash flow *see also* cash flow valuation
  - accounting rate of return 68–70
  - capital 191, 245
  - depreciation 191
  - discounted 28–30, 85, 137, 174
  - dividends 314, 351–2, 354, 358, 362–3
  - earnings based management 131
  - economic profit 185
  - factoring 386
  - forex risk 610
  - inflation 191
  - internal rate of return 39–42, 45–6, 48, 50, 71, 191
  - investment appraisal techniques 28–30, 80, 82–5, 89, 92
  - mergers 269–70, 340, 343
  - net present value 33–7, 50
  - payback 64–5
  - project finance 443
  - return on investment 191
  - shareholder value 134, 136–7, 146, 166–76, 179, 181, 191
  - surplus, return of 269–70
  - valuing companies 330–35
- cash flow valuation 166–71, 330–5
  - adjustments 168
  - amortization 333
  - business, understanding and investigating the underlying 171
  - cash floats 168
  - corporate value 170
  - debt 170
  - discounted 168, 170, 330
  - EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) 334–5
  - forecasts 167–8, 171
  - future 168, 170, 330
  - interest 168, 330
  - intrinsic value 334–5
  - investment 171, 333–4
  - market value 170
  - net present value 166, 169, 331–2
  - owner earnings 333–4
  - planning horizon 169, 171
  - profit figures 168, 331
  - scenario and sensitivity analysis 169
  - shareholder value analysis 170, 172–81
  - stock market valuation, connection with 172
  - strategic business management units 169–70
  - tax 330
  - value drivers 171
- City Code on Takeovers and Mergers 288–90
- Combined Code of Corporate Governance 18
- commercial paper 442
- commodities 547, 561, 570
- Competition Commission investigations 290
- concert parties 293
- conglomerates 256, 262, 263, 265, 278
- convertible bonds 420–4, 432, 561
- corporate governance 17–19
- corporate venturing and incubators 493
- cost leadership strategy 158
- cost of capital 211–52 *see also* debt capital, cost of, weighted average cost of capital
  - betas 241, 248–9
  - capital asset pricing model (CAPM) 245–8
  - cash flow, risk-free rate and 245
  - credit rating 213
  - debt/equity ratios 242
  - equity capital, cost of 213–14, 221–32
  - gearing, degree of operating and financial 249
  - government bonds 213, 250
  - high-yield (junk) bonds 213–14
  - hurdle rates 242–3
  - hybrid securities 236
  - implementation issues 243–5
  - internal rate of return 70–1
  - investment 214
  - net present value 70
  - opportunity costs 212
  - preference share capital, cost of 236
  - retained earnings, cost of 232
  - risk 213–14, 241–2, 245, 250
  - shareholder value 175
  - shareholder wealth maximization 212
  - short term debt 238–9
  - strategic business units, types of business engaged in 249
  - Treasury bills 213
  - Wealth Added Index 196, 200–1, 204
- credit rating 19, 213, 410–15, 417, 442–3
- credit risk 571
- debentures and loan stocks 406, 422–3
- debt *see* debt capital, cost of, debt equity ratio, debt finance
  - debt capital, cost of 213, 232–5, 242
    - bank loans 235
    - bonds 234–5
    - default 233
    - floating-rate debt 235
    - gearing 521–3, 527
    - interest rates 232–5
    - internal rate of return 233
    - Market to Book Ratio 196, 208
    - tax 233–5, 540
    - traded and untraded debt 233–5
  - debt equity ratio

- capital, cost of 242
- dividend policy 349, 360
- financial risk management 541
- gearing 524–5
- weighted average cost of capital 250, 541–2
- debt finance 403–49
  - acceptance credits (bank bills or banker's acceptance) 401–2
  - bank borrowing 373–81
  - bills of exchange 399–401
  - bonds 405–9, 420–8
  - capital 371
  - cash flow valuation 170
  - collateral restrictions 372
  - commercial paper 442
  - convertible bonds 420–4
  - credit rating 410–14
  - currency of 519–20
  - economic profit 182, 184
  - equity capital, cost of 221
  - equity, contrast with 371
  - factoring 386–91
  - financial distress 540
  - financial markets 403–49
  - financial risk management 510–44
  - hire purchase 391–3
  - interest 371
  - international sources 428–41
  - leasing 370, 393–8
  - leveraged buyouts 416, 418–20
  - Market Value Added 196, 204
  - medium-finance 370, 402
  - medium-term notes 441–2
  - mezzanine debt and high-yield (junk) bonds 414–20
  - motivation 538–9
  - operating and strategic efficiency 540
  - overdrafts 370, 376–81
  - profits going to shareholders, extraordinary 371
  - project finance 443–5
  - sale and leaseback 445–7
  - securitization 447
  - shareholder value 174
  - shock absorption 372
  - short-term finance 238–9, 370, 402
  - sizes, available to firms of all 369–402
  - syndicated loans 409–10
  - tax deductibility 372
  - term loans 382
  - trade credit 382–6
  - trust deeds and covenants 406–7
  - valuation of bonds 424–8
  - voting rights 371–2
  - weighted average cost of capital 216–20, 238
- deep-discounted rights issue 482
- derivatives 546–7, 560, 564–5
  - arbitrageurs 591
  - caps 584–6
  - floors and collars 586
  - forex risk 628
  - forwards and forward rate agreements 583–5
  - futures 568–96
  - hedging 547, 589–91
  - long-term capital management 547
  - options 585
  - risk management 589–92
  - short-term interest rate futures 576–80
  - speculators 591
  - trading 564
  - underlyings 546
  - users 589–92
- directors
  - bank borrowing, security for 376
  - corporate governance 17–19
  - dealings, model code on 461
  - EBITDA 335
  - floating on the Official List 461, 464–5
  - mergers 288
  - non-executive 17–19
  - performance targets, allotment of shares for
    - achieving 16
  - remuneration committee 18
  - share options 16
  - shareholder wealth maximization 15–16
  - shareholders, control over 19
  - total shareholder return 198
  - venture capital 491
- discounted cash flow 28–30, 168, 170, 330
- distress *see* financial distress, companies in
  - diversification 223–5
- dividend valuation methods (DVMs)
  - assumptions, sensitivity to 320–1
  - cash flow 314
  - dividend growth model 316–17
  - dividends, companies that do not pay 320
  - infinity 315–16
  - input data, quality of 321
  - liquidation dividends 314
  - non-constant growth 318–19
  - normal growth rate 320
- dividends *see* also dividend valuation methods
  - agency effects 359–60
  - cash flow 351–2, 354, 358, 362–3
  - clienteles effects 354–5
  - credit standing 362–3
  - debt-equity ratio 349, 360
  - earnings 350
    - based management 128
    - fluctuation 357
    - retention of 349, 352–4, 357–9, 364
  - equity capital 231–2, 455
  - floating on the Official List 461
  - growth potential 322–4, 355, 364
  - information conveyance 256–7
  - interim dividends 349
  - investment 349–51, 353, 359, 362, 364
  - liquidity 362–3
  - long-term and short-term 11–12
  - managers 359–60, 362–3
  - Market Value Added 206

- dividends (*continued*)
  - net present value 349–50, 352, 362, 364
  - policy 347–65
  - preference shares 236, 456–9
  - price-earnings ratio 326, 328
  - repurchase of shares 361
  - residual, dividends as a 352
  - risk 358–9
  - scrip dividends and issues 360, 484
  - share buy-backs 360–2
  - shareholder value 11, 350, 352–3
  - shareholder wealth, maximization of 348, 350–3, 361
  - special dividends 360–2
  - tax 355–6, 455, 458–9
  - theorists 249–51
  - total shareholder return 197–8
  - transaction costs 352–3
  - trust deeds and covenants 407
  - valuing companies 314–21
  - Wealth Added Index 200
  - weighted average cost of capital 217–18
- economic profit
  - accounting 181, 183–4, 186–7
  - accounting rate of return 184
  - allocation of revenues, costs and capital to
    - business units 188
  - assets, current value of 186–7
  - balance sheets 186–8
  - capital 182–5, 187–8
  - cash flow 185
  - debt 182, 184
  - economic value added 189
  - entity approach to 181–2
  - equity approach 182–4
  - high economic profit 188
  - inflation 186
  - interest 181, 183
  - investment 185, 188
  - manipulation and arbitrariness 187–8
  - net present value, high economic profit and
    - negative 188
  - performance spread method 182–4
  - profit and loss account 188
  - profit less capital charge method 182
  - rate of return 183
  - reporting 181
  - rewards 186
  - shareholder value 181–8
  - tax 181
  - weighted average cost of capital (WACC)
    - 182–3, 185
- economic risk, forex and 610–11, 625–7
- economic value added (EVA) 189
- employees
  - bankruptcy 6
  - employee share option schemes 561
  - mergers 280–1, 282, 344
  - objectives of the firm 4–5
  - resources 152–4, 159
  - share options 17
  - shareholder value 9–10, 152, 159
  - shareholder wealth maximization 9–10
- Enterprise Investment Scheme (EIS) 492–3
- entire firm value measurement 173–7, 195–209
- entity approach to economic profit 182–3
- equity capital see equity capital, cost of, raising
  - equity capital
- equity capital, cost of 213–14, 221–32
  - betas 224–5, 229–30, 250
  - capital asset pricing model (CAPM) 228–30, 245
  - characteristic line 230–1
  - debt 221, 371
  - diversification 222–3, 224–5
  - dividends 231–2
  - estimating expected returns 228–9
  - fitted regression line 231
  - Gordon growth model method 231–2
  - institutional investors, diversification and 224
  - project finance 443
  - risk 221–8, 230–1, 243–5, 250
  - security market line 225–7
  - Wealth Added Index 200–1
  - weighted average cost of capital 215–19, 237
- equity finance for unquoted firms 485–93
  - business angels (informal venture capitalism) 485–7
  - corporate venturing and incubators 493
  - Enterprise Investment Schemes (EISs) 492–3
  - government sources 493
  - private equity 491–2
  - venture capital 485–92
- equity options 555
- Eurobonds (international bonds) 430–41
  - bearer bonds 430
  - capped bonds 434
  - convertibles 432
  - currencies 431
  - equity released bonds 432
  - euro bonds, distinction from 431
  - floating rate notes (FRNs) 432
  - global investment grades 440–1
  - interest 430, 432–3
  - International Securities Market Association 431, 435
  - issuing 434–41
  - prices 438–9
  - reverse floaters 434
  - straight fixed-rate bonds 432
  - warrants attached, bonds with 432
  - withholding tax 430
  - zero coupons 434
- Eurocommercial paper 442
- Eurodeposit accounts 429
- Eurodollars 428–9
- Eurosecurities 429
- exchange-rate risk, managing see forex (foreign exchange)
- experts and advisers 304–5

- factoring 386–91
  - cash flow 386
  - charges 387
  - credit insurance 389
  - invoice discounting 389–91
  - recourse and non-recourse 389
  - sales ledger administration 388
- finance leases 395–6
- financial distress, companies in
  - agency costs 534
  - cash-generative ability of the business 532
  - debt capital, cost of 540
  - economic activity, sensitivity to general level of 531
  - financial risk management 510, 540, 542
  - fixed to variable costs, proportion of 531
  - gearing 218–19, 529–34, 542
  - liquidity and marketability 531–2
  - net asset value 311
- financial markets, debt finance from 403–49
- financial risk
  - agency costs 534–6
  - asset financing 518–19
  - balance sheet repair 542–3
  - banks 9
  - business risk 511, 529
  - capital, cost of 213–14, 241–2, 245, 250
  - capital structure arguments 540–3
  - caps 584–6
  - costs of issue/arrangements 516
  - credit risk 571
  - currency risk 513, 519–20, 590
  - debt finance 510–44
  - derivatives 589–92
  - diversification 222–3, 224–5, 265–6
  - dividend policy 358–9
  - equity capital, cost of 221–8, 243–5, 250
  - financial distress 510, 540, 542
  - financial planning 510
  - financial slack 537–8
  - financial structure, risk in 514–21
  - forwards and forward rate agreements 580–3
  - future finance, uncertainty of getting 516
  - futures 568–96
  - gearing 521–34, 540–2
  - hedging 556–7, 589–90
  - historic risk premiums 244
  - insurable risk 512–13
  - interest rates 520–1, 513–14, 520–1
  - investment 27
  - LIBOR ((London Inter-Bank Offered Rate) 514
  - management 510–44
  - match or not to match 517–19
  - maturity structure, debt and 515–16
  - mergers 265–6
  - moral hazard, insurable risk and 512
  - motivation 538–9
  - operating and strategic efficiency 540
  - pecking order 536–8
  - political risk 444
  - premiums 221–2, 226–8, 243–5, 250
  - profit maximization 12
  - reinvestment risk 539–40
  - rewards 510
  - risk-free return 27
  - risk-return relationships, shifting 227
  - share options 556–7
  - shareholder wealth maximization 9
  - short-term interest rate futures 576–80
  - signaling 538
  - swaps 586–9
  - systematic 21, 223–5, 238–9, 250
  - time value of money 27
  - total shareholder return, risk classes and 198
  - transaction and translation risk 617–25
  - trust deeds and covenants 407
  - venture capital 487–9
  - weighted average cost of capital 215–16, 238–9, 540–2
- fixed and floating charges 375, 378, 406
- floating on the Official List 459–78
  - accountants 465
  - allotment of shares 471
  - Alternative Investment Market (AIM), Official List and 473–5
  - book-building 472–3
  - brokers 465, 467
  - closing of offers 471
  - conditions 461
  - continuing obligations after flotation 465–6
  - costs of new issues 475–8
  - dealing, start of 471
  - directors 464–5
    - dealings, model code on 461
  - discounts 476
  - disillusionment and dissatisfaction with
    - quotation 493–503
  - dividends 461
  - equity capital, raising 459–73
  - financial statements 465
  - Impact Day 471
  - intermediaries offer 468
  - introductions 467
  - issuing process 462–8
  - market pricing cost 476
  - mergers 460
  - offers for sale 466–7
  - opportunity costs 476
  - placing 467–8
  - price sensitive information 461, 465
  - professional expenses 477–8
  - prospectuses 460–1, 465, 466, 471
  - publicity, pre-launch 468
  - rate of return 476
  - registrars 465
  - share price 466–7
  - solicitors 465
  - sponsors 462, 464, 467, 476
  - strike price 467



- floating on the official list (*continued*)
  - subscription, offer for 467
  - technicalities 468–9
  - techMARK 462
  - tender, offers for sale by 466–7
  - timetable for a new offer 468–73
  - track record 462
  - UK Listing Authority 459–62, 464–6
  - underwriters, paying 464
  - valuation 460
- floating rate notes 408–9, 432
- floors and collars 586
- foreign exchange *see* forex risk (foreign exchange)
- forex risk (foreign exchange) 595–628
  - 24 hour trading 600–1
  - abroad, income to be received from 597
  - balance sheets 608, 609
  - brokers 600
  - cash flow 610
  - commercial banks 600
  - contingency planning 626
  - covering 606–7
  - currency markets 599–600
  - currency options 617–22
  - currency rates 601–5
  - derivatives 628
  - economic risk 610–11, 625–7
  - exchange rate mechanism 596
  - fixed and floating exchange rates 598
  - foreign operations, long-term viability of 598
  - forward exchange markets 602–7
  - forward market hedge 613–14
  - futures 615–17
  - groups of companies 612–13
  - hedging 613–15, 621–2, 625
  - home currency, invoicing in 611
  - imports at a future date, amount actually paid for 597
  - leading and lagging 613
  - matching 612–13
  - money market hedge 614–15
  - netting, multinationals and 612
  - options 562
  - overseas investment projects, acceptability of 598
  - percentage point moves, effects of 596–7
  - profit and loss account 610
  - spot exchange markets 602–5
  - strategies 611–22
  - transaction and translation risk 607–25
  - valuation of foreign assets and liabilities 597
  - volatility in 598–9
- forwards and forward rate agreements
  - contracts 581–3
  - currency options 619
  - derivatives 580–5
  - forex risk 602–7
  - futures 585
  - hedging 583–4, 613–14
  - interest rates 581–3
  - options 585
  - over-the-counter instruments 582
  - price 580–2
  - risk management 580–4
- future dividend growth, estimates of
  - accounts 323
  - economy, forecasts on the 323–4
  - financial statement evaluation 323
  - historical growth rate, using the 323
  - internal liquidity ratios 323
  - management, evaluation of 322
  - firm, focus on the 322–3
  - operating performance ratios 323
  - rate of return 322
  - ratio analysis 323
  - risk analysis 323
  - strategic analysis 322
- futures
  - arbitrageurs 591
  - brokers 576
  - buying and selling 576
  - calls 573, 619–20
  - clearing houses 569, 571
  - commodities 547, 570
  - contracts 571–4, 615–17
  - counterparties 569, 571
  - credit risk 571
  - derivatives 568–96
  - equity index 574–5
  - forex risk 615–17
  - forwards and forward rate agreements, comparison with 585
  - FTSE100 574
  - hedging 573–5, 616–17
  - leverage 572
  - LIFFE CONNECT 576
  - margins 568–9, 571–3
  - marking to market and margins 571, 572, 574
  - options 573, 585, 619
  - put options 573, 619
  - risk management 568–96
  - settlement 573–6
  - short-term interest rate futures 576–80
  - spot delivery 568–9
  - transaction risk 615–17
- gearing
  - agency costs 535
  - balance sheet assets 525
  - betas 249
  - business and financial risk 529
  - capital 249, 523, 524–5
  - debt capital 521–3, 527
  - debt to equity ratio 524–5
  - financial 249, 523
  - financial distress, companies in 218–19, 529–34, 542
  - financial risk management 521–34, 540–2
  - income 523, 525–6
  - interest 522, 525, 527–8
  - levels 522, 542

- mergers 299
- operating 249, 523
- overdrafts 524
- performance levels 527–8
- preference shares 458
- shareholder wealth maximization 542
- short-term borrowing 524
- solvency and liquidity ratios 526
- tax 524, 529
  - weighted average cost of capital 218–20
- government bonds 213, 250
- government sources of equity finance 493
  
- head office, role of the 159–62
- hedging
  - caps 584
  - currency options 619–21
  - currency risk 590
  - deposits 578–9
  - derivatives 547, 589–91
  - economic risk 625–7
  - forex 613–15, 621–2, 625–7
  - forward rate agreements 583–4
  - futures 573–5, 616–17
  - index options 558
  - interest rates 590
  - money market 614–15
  - risk 556–7, 589
  - share options 556–7
  - short-term interest rate futures 580
  - speculators 591
  - translation risk 623–5
- high-yield (junk) bonds 213–14, 411, 414–20
- hire purchase 391–3
  
- incubators 493
- index options 558–60
- insurable risk 512–13
- interest and interest rates 50–5
  - agency costs 535
  - annual rate, converting monthly and daily rates to 58–9
  - annuities 55–7
  - bank borrowing 373–4
  - bills of exchange 401
  - bonds 405, 409, 420, 422–8
  - caps 584, 586
  - cash flow 85, 168, 330
  - commercial paper 442
  - compound 51–3, 629–32
  - debt capital, cost of 232–5
  - debt finance 371
  - discounting semi-annually, monthly and daily 57–8
  - economic profit 181, 183
  - Eurobonds 430, 432–3
  - financial risk 513–14, 516–17, 520–1
  - fixed or floating borrowings 520–1
  - forwards and forward rate agreements 583
  - gearing 522, 525, 527–8
  - hedging 590
  - hire purchase 393
  - internal rate of return 39, 40–1, 43
  - investment appraisal techniques 85
  - leasing 396
  - LIBOR (London Inter-Bank Offered Rate) 373, 514
  - medium-term notes 441
  - overdrafts 377, 380
  - present values 52–3
  - project finance 444
  - rate of, determining the 53–5
  - short-term interest rate futures 576–80
  - simple 50–1
  - swaps 586–9
  - tax 233
  - term loans 382
  - term structure of 516–17
  - trade credit 383–4
  - weighted average cost of capital 217–18, 236–7
- internal rate of return 40–5, 48–9, 70–1
  - cash flow 39–42, 45–6, 48, 50, 71, 191
  - debt capital, cost of 233
  - decision rules and tools 41–2, 47
  - discount rate 40–7
  - forecasts 71
  - future cash flows 40
  - interest rate 39, 40–1, 43
  - interpolation calculation 44–6
  - investment appraisal techniques 39–50, 63, 70–1, 89–90
  - net present value 36–7, 42–50, 70
  - opportunity cost 41, 43, 45, 49
  - psychological reasons for popularity of 70
  - ranking 49, 71
  - required rate of return, calculated without knowledge of 70–1
  - shareholder wealth, maximization of 39–50, 70–1
  - time value of money 28, 39, 50
  - total shareholder return 197
- international bonds see Eurobonds
- International Securities Market Association (ISMA) 431, 435
- international sources of debt finance 428–41
  - Eurobonds (international bonds) 430–41
  - Eurodeposit accounts 429
  - Eurodollars 428–9
  - Eurosecurities 429
  - foreign bonds 430
  - securities market 428
- introductions, flotations and 467
- investment appraisal techniques 24–5, 30–49, 61–71, 74–5, 85–92
  - accounting rate of return 63, 67–9, 90, 92
  - audits, post-completion 91–2
  - capital allocation 74, 88
  - capital appropriation request forms 90
  - capital expenditure budget and controls 89, 90–2

- investment appraisal techniques (*continued*)
  - capital investment decisions 81, 91
  - cash flow 28–30, 80, 82–5, 89, 90–2
  - cost reduction 88
  - decision-making in companies 75–92
  - development stage 87–8
  - discounted cash flow 28–30, 85
  - entrepreneurial spirit, stifling the 78–9
  - environment scanning process 86–7
  - equipment replacement 87–8
  - expenses 76
  - financial control mechanisms 91
  - follow-up procedure 91
  - ideas, generation of 86–7, 88
  - implementation 90–2
  - incidental effects, inclusion of all 83–4
  - intangible benefits 79–82, 84
  - interest 85
  - internal rate of return 39–50, 63, 70–1, 89–90
  - net present value 30–9, 42–5, 47–50, 63, 80, 89–90
  - new products 88
  - opportunity cost of capital 83, 89
  - overheads 84–5
  - payback 62–6, 88, 92
  - products, expansion or improvement of existing 87, 88
  - psychological effect of monitoring 91
  - resources, allocation of 74
  - screening 88–9
  - selection, managerial art of 75–82
  - shareholder value 25–30, 78–9
  - shareholder wealth maximization 78–9
  - social context 76
  - state of the art techniques 30–49
  - statutory considerations 88
  - strategy 75–6, 89
  - sunken costs, irrelevance of 84
  - time value of money 25–7
  - traditional techniques 61–71
  - welfare considerations 88
- investments *see also* investment appraisal techniques
  - capital, cost of 214
  - cash flow 171, 191, 333–4
  - communication 14
  - dividend policy 349–51, 353, 359, 362, 364
  - earnings based management 127–8
  - economic profit 185, 188
  - mathematical tools 55
  - private equity 491
  - property investment companies 312
  - reinvestment risk 539–40
  - risk 5, 27
  - shareholder value 25–30, 174, 176–80
  - trusts 313
  - venture capital 487–91
  - weighted average cost of capital 218–20
- invoice finance *see* factoring
- junk bonds 213–14, 411, 414–20
- land options 561
- leasing 395–9
  - accounting 395–6
  - balance sheets 396–7
  - debt finance 370, 393–8
  - finance lease 395–6
  - interest 396
  - off-balance-sheet finance 396–7
  - operating lease 394–5, 396–7
  - sale and leaseback 445–7
  - shareholder value 119, 125, 135, 137–42
  - tax 395–6, 398
- leveraged buyouts 416, 418–20
- LIFFE share options 554, 555
- liquidation dividends 314
- loans *see also* bank borrowing
  - covenants 535
  - loan stocks 406, 422–3
  - swaps 586–7, 590
  - syndicated 409–10
  - term 382
- London Stock Exchange, floating on the 452–3
- management buyouts and buyins 416, 488–9, 491
- managerial incentive schemes 199–200
- managing mergers 273–94
  - absorption of target 277–8
  - audits 284
  - bidding stage 277
  - communication 276, 281
  - conglomerate mergers 278
  - data, identifiable and quantifiable 274
  - employees 280–1, 282, 344
  - holding company, preservation or portfolio approach 277–8
  - human factors 277–8, 282
  - implementation 275–6
  - integration 274–8, 280–4
  - negotiation strategy and tactics 274
  - organizational culture and processes 274–5, 277, 281
  - preparation 274, 277, 284
  - progression of mergers 275
  - screening 275–6
  - shareholder value 278–80
  - shareholder wealth maximization 274
  - strategy 274–6, 278–80
  - symbiosis-based mergers 278
  - synergy 278
  - target evaluation 274
- Market to Book Ratio (MBR) 196, 208–9
- Market Value Added (MVA) 196, 204–9
- matching 515–16, 612–13
- mathematical tools for finance 50–9
- measures of value creation 165–93
- medium-term notes (MTNs) 441–2
- merger process 287–305
  - advisers and experts 304–5
  - appraisal of targets 290, 292
  - auctions 296

- bid 294–5
  - acceptance 295
  - action before and after the 290–3, 295–7
  - hostile 292, 294, 296–7
  - premiums 292, 339
- capital gains tax 298–9
- cash payment for shares 293, 298–9
- City Code on Takeovers and Mergers 288–90
- Competition Commission investigations 290
- concert parties 293
- creation of value 339–40
- dawn raids 292
- defense tactics 296–7
- directors 288
- disclosure of shareholdings 292
- European Commission 290
- Financial Services Authority 289
- gearing, adjusting the financial 299
- hostile bids 292, 294, 296–7
- identification of targets 290
- indicative offers 293
- management 292
- mandatory bids 293
- negotiation 292
- offer documents, posting 294
- Office of Fair Trading 290
- price to earnings ratio 299–304
- recommendations 292
- self-regulation 288, 296
- shareholders, equal treatment of 290
- shares in acquirer, receiving 299–304
- shares of target, paying for 290–304
- Takeover Panel 288–9, 292–3, 296–9
- timetable 294
- unconditional offers 295–6
- mergers 253–85 *see also* managing mergers, merger process
  - acquisitions 129, 255–6
  - advisers, motives of 270–1
  - bargain buying 266
  - cash flow 269–70, 340, 343
  - competition 256, 262
  - conglomerates 256, 262, 263, 265
  - cross-border, performance of 273
  - decisions 254–5
  - drivers 259–71
  - economies of scale 263
  - efficiency gains 340
  - entry to new markets and industries 264–5
  - floating on the Official List 460
  - horizontal 256, 262
  - hubris 268–9
  - inefficient management 266
  - integration 256, 264, 341, 344
  - internalization of transactions 264
  - market power 260–3
  - motives 259–71, 284
  - net present value 254, 269
  - performance, summary of evidence on 272–3
  - risk diversification 265–6
  - shareholders
    - acquiring firms, gains of 272–3
    - value 119, 124, 178
  - shares, undervalued 266–7
  - suppliers, motives of 271
  - survival 269
  - synergy 259–60, 263
  - takeovers 9, 17, 124, 255, 311–12, 339
  - tax advantages 265
  - technical skills 264–5
  - third party motives 270–1
  - value 255, 260, 339–40
  - vertical 256, 262
- mezzanine debt and high-yield (junk) bonds 414–20
- net asset value (NAV)
  - assets, useful 311
  - balance sheets 309–11
  - discounted income flow techniques 312–14
  - financial difficulty, firms in 311
  - investment trusts 313
  - property investment companies 312
  - resource-based companies 314
  - shareholder value 311
  - takeover bids 311–12
  - valuing companies 309–14
- net present value (NPV) 32–7
  - accounting rate of return 69
  - alternative use of funds 31
  - cash flow 33–7, 50, 166, 169, 331–2
  - cost of capital 70
  - decision-making 30–1
  - discount rate 32–3, 35, 38–9, 49
  - dividend policy 349–50, 352, 362, 364
  - economic profit 188
  - internal rate of return 36–7, 42–5, 47–50, 70
  - investment appraisal techniques 30–9, 42–5, 47–50, 63, 80, 89–90
  - mergers 254, 269
  - opportunity cost of capital 30–5
  - payback 64, 66
  - perpetuity formula 36
  - ranking 49
  - rate of return 31–2, 36–7, 47–9
  - real options 562–4
  - risk in project appraisal 98–9, 102–3, 106–9, 110–11
  - shareholder wealth maximization 30–5
  - time value of money 28, 30, 36, 50
  - weighted average cost of capital 238
- netting 612
- objectives of the firm 1–20
  - confusion of 10
  - decision-making 8
  - employee agitation, minimizing 4–5
  - growth 7
  - interested parties 3–4
  - investments, risk aversion and 5
  - market share, achieving a target 4

- objectives of the firm (*continued*)
  - profit maximization 7
  - risk aversion 5
  - shareholder value 146–7
  - shareholder wealth, maximization of 7–20
  - surplus 3–4
  - survival 5
  - variety of 4–7
- off-balance sheet finance 396–7, 444
- Official List *see* floating on the Official List
- opportunity costs 25
  - capital, cost of 212
  - equity 200
  - floating on the Official List 476
  - internal rate of return 41, 43, 45, 49
  - investment appraisal techniques 83, 89
  - net present value 30–5
  - retained earnings, cost of 232
  - shareholder value 25–6
  - Wealth Added Index 200
- options 547–8 *see also* share options
  - commodities 547, 561
  - control of companies, taking 561–2
  - convertible bonds 561
  - currency 617–22
  - derivatives 585
  - employee share option schemes 561
  - exercise of 548
  - foreign exchange rate losses, protection from 562
  - forwards and forward rate agreements 585
  - futures, comparison with 585
  - index 558–60
  - land 548
  - put 554, 556, 562–3, 573, 619
  - real 562–4
  - rights issues 561
  - share option schemes 561
  - share underwriting 561
  - traded 548
  - warrants 561
- overdrafts 373, 376–81
  - arrangement fees 381
  - banks, criticism of 380–1
  - fixed or floating charges 378
  - gearing 524
  - interest rate 377, 380
  - seasonal businesses 378
  - small businesses 381
  - withdrawal of 377–8, 380
- overheads 84–5
- over-the-counter and exchange-traded derivatives 405, 582, 592
- payback 62–6, 88, 92
- pecking order for finance 536–8
- performance
  - accounting rate of return 70
  - directors, allotment of shares and 16
  - economic profit 182–4
  - gearing 527–8
  - head office, role of the 161–2
  - Market Value Added 206–8
  - mergers 272–3
  - shareholder value 124, 133, 135–6, 138–9, 158
  - strategic assessment 150, 156
  - strategic business unit management 156
  - total shareholder return 198–9
  - Wealth Added Index 201
- placing 467–8, 483, 536
- political risk 444
- pre-emption rights 479, 480, 483
- preference shares 457–9
  - bonds 458
  - capital, cost of 236
  - convertibles 459
  - cumulative 459
  - dividends 236, 456–9
  - equity capital, raising 456–9
  - gearing 458
  - high cost of capital 458
  - management, influence over 457
  - Market Value Added 206
  - profits, extraordinary 457
  - rate of return 457
  - redeemable 459
  - tax deductions 458–9
  - venture capital 490–1
- price-earnings ratio (PER) model 299–304, 324–30
- private equity 491–2
- probability analysis, risk and 106–13
- profit and loss account 188, 610
- profit maximization 7, 12–14
- project appraisal 150
- project finance 443–5
- property investment companies 312
- prospectuses 460–1, 465–6, 471, 473, 475
- put options 554, 556, 562–3, 573, 617–19
- raising equity capital 451–506
  - acquisitions for shares, 483
  - Alternative Investment Market (AIM) 453
  - authorized capital 455–6
  - broker, hiring a corporate 465
  - business angels 485–7
  - bought deal 483
  - claw back 483
  - closing of offer 471
  - control, loss of 455
  - corporate venturing and incubators 493
  - dividends 454–5
  - Enterprise Investment Schemes 492–3
  - floating on the Official List 459–73
  - government sources 493
  - high costs 455
  - issued values 455–6
  - limited companies 456
  - listed companies 456
  - London Stock Exchange, floating on the 452–3
  - Official List 453, 463, 473–5
  - open offers 483

- ordinary shares 454–5
- par values 455–6
- pecking order 536
- placings 483, 536
- pre-emption rights, waiver of 483
- preference shares 456–9
- private equity 491–2
- public limited companies 456
- rights issue 479–82
- scrip issues 484
- small and medium-sized firms 453
- taxable profit, dividends and 455
- vendor placing 483
- venture capital 485–91, 492
- warrants 484–5
- Rappaport's value drivers 172–5, 178, 180
- rate of return *see also* internal rate of return
  - accounting (ARR) 67–70, 90, 92, 133–4, 184
  - bonds, valuation of 426–8
  - capital, on existing 140–1
  - dividends, estimates of future growth of 322
  - earnings based management 128–30
  - economic profit 183
  - floating on the Official List 476
  - Market to Book Ratio 196, 207
  - Market Value Added 196, 207
  - preference shares 457
  - risk in project appraisal 98
  - shareholder value 133–43
  - strategic assessment 151
- real options 562–4
- reinvestment risk 539–40
- required rate of return *see* cost of capital
- resources 74, 152–6, 159, 161, 314
- rights issues
  - deep-discounted rights issue 482
  - discounts 479–82
  - ex-rights and cum-rights 481
  - market price 479–82
  - pre-emption rights 479, 480
  - underwriting fees 482
- risk *see* financial risk, forex risk, risk in project appraisal
  - appraisal
- risk in project appraisal 93–113 *see also* probability analysis
  - adjusting for risk 99
  - beta analysis 113
  - certainty and uncertainty 95
  - communication 112
  - contingency plans 104
  - discount rate, adjusting for risk through 98, 104
  - expected return 107–9
  - historical data 96
  - information in decision-making 103
  - isolation, projects viewed in 112
  - net present value 98–9, 102–3, 106–8, 110–11
  - objective probabilities 96–4
  - quantified subjective 112
  - rate of return 98
  - scenario analysis 104–6, 113
  - searches, directing 103
  - sensitivity analysis 98–104, 113
  - shareholder wealth maximization 97
  - standard deviation 109–11
  - subjective probabilities 97–8, 112–13
- sale and leaseback 445–7
- sales ledger administration 388
- scenario analysis 104–6
- scrip issues 360, 484
- secured convertible debentures 422
- securitisation 447–8
- self-liquidating convertible bonds 423
- sensitivity analysis 98–104
- share buybacks 360–2
- share options 548–57, 561
  - at-the-money option 550
  - call options 548–57
  - directors 16
  - employee share options 17, 561
  - equity options 555
  - Euronext.liffe 548
  - hedging, risk reduction and 556–7
  - in-the-money option 549
  - intrinsic value 549–51
  - LIFFE share and equity options 554, 555
  - out-of-the-money option 549
  - price 549–52, 557
  - profit 553
  - put options 554, 556
  - risk reduction 556–7
  - time value 549
  - trading 548
  - traditional options 554, 556
  - writers 548, 552–6
- shareholder supremacy 4
- shareholder value 11–12
  - cash flow 166–72, 191
  - communication 14–15, 19
  - creation of 166–72, 191, 200–1, 204, 206, 207, 339–40
  - destruction 149, 200, 204–5
  - dividends 11, 350, 352–3
  - economic profit 181–8
  - economic value added 189
  - investment 25–30, 78–9
  - Market Value Added 204–7
  - measures of value creation 165–93
  - mergers 278–80, 339–40
  - net asset value 311
  - opportunity costs 25–6
  - strategic business unit management 149
  - time value of money 25–7
- shareholder value managed versus earnings
  - managed companies 117–43
  - accounting rate of return 133, 134
  - capital, increasing the return on existing 140–1
  - capitalization 133
  - cash flow 134, 136–7
  - creation 121–3, 134–43

- shareholder value (*continued*)
  - destruction of 121–3
  - divestiture of assets 141
  - earnings per share 134
  - failings of earnings-based management 120–32
  - FTSE100 companies 121–3
  - growth 137–8
  - investment 119, 125, 135, 137–42
  - market share 124–5
  - measurement 125
  - mergers 119, 124
  - performance 124, 133, 135–6, 138–9
  - positive spread units, raising investment in 141
  - rate of return
    - accounting 133, 134
    - existing capital, increasing return on 140–1
    - lowering the required 142–3
    - required 135–9, 142–3
  - research and development 133
  - reward 119
  - shareholder wealth maximization 120, 123, 125
  - strategic analysis and objectives 119, 124
  - strategic business units 139–40
  - three steps to value 125
  - value action pentagon 139–40
- shareholder value analysis
  - benchmarking 180
  - cash flow 172–6, 179, 181
  - corporate value 174, 176–7
  - data availability 181
  - debt, market value of 174
  - depreciation 174
  - entire companies, valuing 173–7
  - growth 178
  - investment 174, 176–80
  - liquidation 178
  - managerial effort, alignment of 180
  - new product areas 178
  - profit margin 172–3, 180
  - Rappaport's value drivers 172–5, 178, 180
  - rate of return, required 175
  - rewards 180
  - sensitivity and scenario analysis 180, 180
  - shareholder wealth maximization 180
  - strategy valuation using 177–9
  - takeovers 178
  - targets 180, 181
  - tax 173
  - trade sale or spin-off 178
  - weighted average required return on debt and equity capital 176
- shareholder value through strategy 145–64
  - cash flow 146
  - competitive advantage 156, 158
  - cost leadership strategy 158
  - differentiation strategy 158
  - head office, role of the 159–62
  - motivation 162–4
  - objectives of the firm 146–7
  - people resources 152, 159
  - performance spread 158
  - qualitative assessment and qualitative analysis of options 158
  - resources 152–6, 159
  - shareholder wealth maximization 146–7
  - short and long-term goals 163
  - strategic assessment and choice 150–9
  - strategic business unit management 148–50
  - strategy implementation 159
  - targets 162–4
- shareholder wealth, maximization of
  - agency costs 534–5
  - capital, cost of 212
  - cash flow valuation 169–70
  - control and ownership, separation of 15–16
  - corporate governance 17–19
  - credit rating 19
  - decision-making 8, 10, 20
  - destruction 15, 219–20, 350, 352
  - directors 15–16
  - dividend policy 348, 350–2
  - employees, self-interest of 9–10
  - football clubs, objectives of 10–11
  - gearing 542
  - goal congruence 16
  - information flow 19
  - internal rate of return 39–50, 70–1
  - investment appraisal techniques 78–9
  - managerialism 15–16
  - managers, sacking 16
  - mergers 274
  - net present value 30–5
  - objectives of 7–20
  - profit maximization 12
  - research and development 12
  - rewards with, linking 16
  - risk 9, 97
  - sackings 16
  - share options 16–17
  - share sales 17
  - shareholder value 120, 123, 125, 146–7, 180
  - takeovers 9, 17
  - valuing companies 308
  - weighted average cost of capital 219–20
- short-term interest rate futures 576–80
- signaling 538
- solicitors, flotation and 465
- speculators 591
- sponsors, flotation and 462, 464, 467, 476
- state of the art appraisal techniques 30–49
- strategic assessment 150–7
  - competitive advantage 156
  - economics of the market 150
  - industry attractiveness 150
  - life-cycle stage of value potential 156–7
  - performance spread 150, 156
  - rate of return 151
  - resources, strength of 151–6
  - strategy planes 157
  - substitute products 150
  - threshold competence 151

- TRRACK system, resources and 152–6
- strategic business unit management 148–50
  - alternative strategies, generation and alternative 163–4
  - budgeting 150
  - capital, cost of 238–9, 249
  - cash flow return on investment 191
  - competitive position, establishing a good 148
  - head office, role of the 160
  - performance spread 156
  - position assessment 163
  - project appraisal 150
  - shareholder value 139–40, 148–50
  - strategy planes 157
  - targets 163
  - weighted average cost of capital 238–9
- swaps 586–90
- swaption 589
- syndicated loans 409–10
  
- Takeover Panel 288–9, 292–3, 296–8
- term loans 382
- time value of money 25–7
  - accounting rate of return 69
  - consumption sacrifice 26, 27
  - discounted cash flow 28
  - earnings based management 128–9
  - index options 558
  - inflation 26, 27
  - internal rate of return 28, 39, 50
  - investment appraisal techniques 25–7
  - net present value 28, 30, 36, 50
  - payback 64–5
  - risk 27
  - share options 549
  - shareholder value 25–7
- total shareholder return (TSR) 196–9, 209
  - directors 198
  - dividends 197–8
  - internal rate of return 197
  - managerial incentive schemes 199–200
  - multi-period 197, 199
  - one-period 197, 199
  - performance 198–9
  - risk class, relation of return to 199
  - share prices 197, 199
  - time period chosen, dependence on 199
- trade credit 382–6
- transaction risk, forex and 607–22
  - currency options 617–22
  - forward market hedge 613–14
  - futures 615–17
  - groups of companies 612–13
  - hedging 613–15, 621–2
  - home currency, invoicing in 611
  - leading and lagging 613
  - matching 612–13
  - money market hedge 614–15
  - netting 612
  - strategies 611–22
- translation risk, forex and 609–10, 622–5
- Treasury bills 213
- TRRACK system, resources and 152–6
- UK Listing Authority 459–62, 464–6
- underwriters 464, 482, 561
  
- valuation of bonds 421–2, 424–8
- value *see also* cash flow valuation, net asset value, net present value, shareholder value
  - bonds 424–8
  - dividend valuation methods 314, 315–21
  - floating on the Official List 460
  - forex risk 597
  - intrinsic 555
  - mergers 255, 260
  - time value of money 69
- valuing companies 307–45
  - cash flow, valuation using 330–35
  - dividends, valuation methods and 314–21
  - entire firm value measurement 195–209
  - income flow 314
  - management, evaluation of 322
  - managerial control 339–44
  - mergers 339–44
  - net asset value 309–14
  - price earnings ratio model 324–30
  - proxies 336–7
  - shareholder wealth, maximization of 308
  - shares, unquoted 335–6
  - skills 308–9
  - takeovers 339
  - technological innovation industries 336
  - unusual companies 336–9
- venture capital 485–92
  - business angels 485–7
  - captives and semi-captives 489
  - development capital investment trusts 491–2
  - directors 491
  - expansion 488
  - independents 489
  - investments 487–91
  - management buyins and buyouts 488–9
  - preference shares 490–1
  - private equity 491–2
  - public-to-private 488
  - risk 487–9
  - seedcorn 488
  - start-up 488
  - tax 492
  - trusts 491–2
  
- warrants 432, 484–5, 561
- wealth *see* shareholder wealth, maximization of, Wealth Added Index (WAI)
- Wealth Added Index (WAI) 196, 200–9
  - capital asset pricing model 204
  - cost of capital 196, 200–1, 204
  - creation and destruction of value 200–1
  - dividends 200



- Wealth Added Index (WAI) (*continued*)
- equity opportunity cost 200
  - equity, return on 200–1
  - performance 201
  - share mispricing 204
- weighted average cost of capital (WACC) 215–21, 236–42, 249
- balance sheets 237
  - capital asset pricing model 239, 241
  - capital structures 219
  - debt 216–20, 238
  - debt/equity ratio 250, 541–2
  - dividends 217–18
  - economic profit 182–3, 185
  - economic value added 189
  - equity capital 215–19, 237
  - financial risk management 540–2
  - gearing 218–20
  - hurdle rate 242–3
  - interest 217–18, 236–7
  - investments 218–20
  - lowering the 216–17
  - managers, role of 239–43
  - market value 236, 249–50
  - net present value 238
  - risk 215–16, 238–9
  - shareholder returns, increasing 216–17
  - shareholder value 176
  - shareholder wealth, reduction in 219–20
  - short-term debt 238
  - strategic business units and projects, application to 238–9
  - tax benefits 217–18