Profitability, Accounting Theory and Methodology

The selected essays of Geoffrey Whittington

Geoffrey Whittington

Routledge Historical Perspectives in Accounting

Profitability, Accounting Theory and Methodology

Geoffrey Whittington is one of Britain's leading accounting theorists and researchers. He became a Chartered Accountant after studying under Professors W.T.Baxter and H.C.Edey at the LSE, and then obtained a Ph.D. in economics from Cambridge, and has been a major contributor to the accounting literature for over 30 years, with significant contributions to economics as well. He held Chairs of Accounting at the Universities of Edinburgh (1972–5), Bristol (1975–88) and Cambridge (1988–2001). He was as a member of the UK Monopolies and Mergers Commission (1987–96), and he served first as a consultant and then as a member of the Accounting Standards Board. From 2001 to 2006 he was a full-time member of the International Accounting Standards Board, based in London.

Profitability, Accounting Theory and Methodology brings together for the first time a selection of his most important essays and articles, encompassing his work on inflation accounting, accounting theory and methodology, standard setting and empirical analysis of financial accounting data. The book also includes a new introduction which discusses the evolution of his professional career and places the articles in the context of their times and in his own intellectual development. This book will be extremely useful for historians of accounting as well as accountancy practitioners and researchers.

Routledge Historical Perspectives in Accounting

Edited by Stephen A.Zeff
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Profitability, Accounting Theory and Methodology

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Foreword

Geoffrey Whittington was trained as a Chartered Accountant and then as an economist, and he has become one of our leading accounting theorists and researchers as well as a major contributor to standard setting at both the national and international levels.

Geoff received a B.Sc. with an emphasis in accounting in 1959 from the London School of Economics, where he was a Leverhulme Scholar. After having articled with a small accountancy firm in London, he was admitted in 1963 as an associate of the Institute of Chartered Accountants in England and Wales (ICAEW), becoming a fellow in 1973. He then spent ten years at Cambridge University as a research officer in economics and as a doctoral student in the Department of Applied Economics. His Ph.D. examiner was Professor Richard Stone, who was to receive the Nobel Prize in economics in 1984 for his foundational work in national income accounting. After receiving the Ph.D. in 1971, Whittington moved back to accounting, taking successive Chairs at the Universities of Edinburgh, Bristol and Cambridge. He retired from Cambridge in 2001.

Continuing to bridge accounting and economics, he served three terms, from 1987 to 1996, as a part-time member of the UK Monopolies and Mergers Commission. In the standard-standard arena, from 1980 to 1990 Geoff was a member of the ICAEW Technical Committee, which advised the Institute's Council on the endorsement of proposed standards coming from the Acccounting Standards Committee. He then served as academic adviser to the Accounting Standards Board from its founding in 1990 to 1994, and was as a board member from 1994 to 2001. In 2001, he became one of the 12 full-time members of the newly established International Accounting Standards Board.

He has served on numerous editorial boards and public and professional advisory committees, and as a consultant to various bodies. In 1995–6, he chaired the Higher Education Funding Council's research rating panel for Accountancy. From 1996 to 2001, he was the professorial research fellow of the Institute of Chartered Accountants of Scotland.

Geoff has published with distinction in both accounting and economics, and the articles reproduced in this collection are ones he has chosen as being representative of his most important writings. Among the awards he has received are an honorary D.Sc. (Social Sciences) from the University of Edinburgh, the inaugural ACCA/BAA Distinguished Academic of the Year Award, and the Founding Societies' Centenary Award of the ICAEW.

I am delighted to publish this Whittington Collection as the first volume in this new Routledge series, *Historical Perspectives in Accounting,* and I am grateful to Geoff for having provided the informative introductory essay.

Stephen Zeff
Rice University
September 2005

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Introduction

This volume contains a selection of my published papers; it is not a comprehensive collection. In making the selection, I have attempted to provide representative coverage of all my research interests (which have tended to be diverse rather than focused). I have also, where a choice has to be made, selected items that have appeared in publication outlets that are less accessible or less well-known to accounting researchers. Just as my interests have tended to be diverse, so have my publication outlets.

The purpose of this Introduction is to explain the factors, both biographical and intellectual, that have shaped my research and publications, in order to put these papers in context. First, there is a brief academic biography. This is followed by a brief, section by section, contextual explanation of the selected papers.

An academic autobiography

I have always been, by inclination and probably by ability, an historian. However, my upbringing gave me a rather puritanical feeling that history was for pleasure and full-time education should lead to profitable employment. However misguided (as I believe it was), this feeling was strongly felt and influenced my early education choices. Its origins are not difficult to identify. My father and both of my grandfathers had all left school at the minimum permissible age to work in the coal mines of Yorkshire, Derbyshire and Nottinghamshire. They had all studied in the evenings to better themselves in their careers, two of them becoming fully qualified mining engineers and rising to senior positions in the mining industry. I was the first member of my family to go to university (as was my wife in hers), and most of my secondary education was spent in an industrial town, Dudley, in the West Midlands, where most of my school mates were in a similar position. Sadly, the institution that provided this vehicle for social progress (Dudley Grammar School, founded in 1562) has since been abolished, in the cause of social progress!

Thus, my first instinct was to become a scientist, like most of my school mates who, in those days of the 1950s, wanted to become nuclear physicists or industrial chemists (biology, in those pre Crick and Watson days, was for people who liked flowers or furry animals). I specialised in science up to my ‘O’ level exams (taken at the age of fifteen), but took history as an extra subject, for pleasure. I then, somewhat precociously and certainly prematurely, considered my choice of career, and, encouraged by my parents, decided to become an accountant, because this offered better prospects (scientists were functionaries; accountants became the bosses). Mercifully, I resisted the temptation to enter accountancy training immediately, and opted instead to stay in the Sixth Form of my school to prepare for university entrance. This gave me the opportunity to study history and geography in more depth. The rigid syllabus of the time prevented me from studying mathematics (now considered essential for many degree courses in economics)

in conjunction with history, so my third subject was English literature, which taught me that there is much more pleasure and instruction to be derived from reading literature than from reading literary criticism. I was fortunate to have an outstanding history teacher, Percy Chance, who had been a Gladstone Memorial Prize-winner at Oxford and later a university teacher. He urged me to apply to read history at Oxford but my utilitarian preferences prevailed and I chose to study economics and accounting at the London School of Economics (LSE), where, on the basis of my performance in the history entrance exam, I was awarded a Leverhulme Entrance Scholarship at the age of seventeen.

The LSE degree (The B.Sc.(Econ.)) was, in those days, a remarkable mixture of various subjects, taught at levels varying from the brilliant to the incompetent. In accounting, I was fortunate to have, as my first lecturer, Will Baxter, who happily remains to this day a guide, philosopher and friend, and my tutor throughout the three years was Harold Edey, whose sharp intellect I much admired and, hopefully, learned from. Outstanding lecturers in other fields included Michael Oakeshott (political theory) and L.C.B.Gower (Company Law).

I left the LSE with a rather highbrow and broad-minded view of accounting which was soon changed by three years as an articled clerk with a fairly small firm of chartered accountants in Bloomsbury. The routine of auditing, ticking and casting endless records was totally boring, as was the Foulks Lynch correspondence course for the professional exams, which emphasised memorisation and detail rather than thought and interpretation. However, more interesting was the preparation of final accounts (usually, confusingly, mixed up with auditing, in the case of our small clients). Even more interesting was the wide variety of businesses and people that we dealt with: this was why chartered accountancy training was regarded as a preparation for business, before the MBA became so popular.

As the period of my articles drew to an end, I was determined to leave professional practice and find employment that gave more opportunity for thought: my LSE experience had left a residual belief that this was possible even within the boundaries of accounting, so I did not despair of finding interesting work outside practice. I made some positive efforts to find such work, but it was a chance reading of an advertisement in a newspaper that led me to apply, successfully, for a post as Junior Research Officer in the Department of Applied Economics (DAE) at Cambridge.

I moved to Cambridge in December 1962, having taken my professional examinations in the previous month. My job at Cambridge was to assemble a computer database of the accounts of all the listed companies in the UK (in excess of 3,000 companies) for the years 1948 to 1960. The pioneering work had been carried out at the National Institute of Economic and Social Research (NIESR), and studies based on this were published in an NIESR monograph edited by Brian Tew and R.F.Henderson (1959). The Board of Trade (later re-named the Department of Trade and Industry) had taken on the preparation of the data and transferred it to punched cards. This medium was suitable only for preparing aggregate data. If it could be transferred to an electronic computer, it would be possible to carry out cross-sectional and time series analysis at the company level. This process was eventually carried out successfully, under my direction, and with the aid of several able computer programmers and research assistants. The first substantial piece of research to come out of it was the book co-authored with Ajit Singh (Singh and

Whittington, 1968), which records some of the work of the data processing (360,000 punched cards was a massive database in those days). My early empirical research (Part 1 of the selected papers) was based mainly on this work.

The Cambridge project required me to learn much more about computing, and I went to courses and learned elementary programming. My professional training had been sadly lacking in computer training, although the skills learned in accounting were very useful in handling databases. It was also obvious that I needed to learn more about economics and statistics. I improved my knowledge of economics by attending lectures in the Faculty of Economics and Politics, of which I was a member, and by enrolling with the University of London Commerce Degree Bureau, an admirable distance learning organisation, which has probably now become a victim of financial economies. In order to demonstrate my newly-acquired knowledge, I took a supplementary B.Sc.(Econ.) Part II in Economics, as an external student of London University in 1964. This satisfied the Cambridge Economics Faculty that I knew enough economics to register for a Ph.D., supervised by Brian Reddaway, whose critical powers were even sharper than those of Harold Edey. Completion of my Ph.D. was delayed by the joint work with Ajit Singh and by teaching commitments, but the thesis was eventually submitted in 1970, the internal examiner being Richard Stone, P.D.Leake Professor of Accounting and Finance at Cambridge, but best known as a Nobel Prize-winning pioneer of econometric modelling and national income accounting. The thesis formed the basis of my 1971 book *The Prediction of Profitability and Other Studies of Company Behaviour*. All of this work involved the use of statistics and econometrics and I had improved my elementary skills in this area by going to lectures (notably the first econometrics lectures in Cambridge, given by the late Michael Farrell) and by working systematically through a series of books on mathematics and statistics recommended by Michael Farrell and with my wife, Joyce (a mathematician, who was then supervising students for the Mathematics Tripos) as tutor. I completed my education in this area by attending graduate courses at the LSE in my sabbatical year, 1970–71.

In addition to all of this self-improvement, I found myself heavily involved in teaching, partly because of the flood of economics undergraduates into Cambridge around the time of the election of the Wilson government (1964), induced by the belief that the world had serious economic problems (true) and that these could be solved by training more economists (sadly, not entirely true). In the autumn of 1964, I started supervising undergraduates for the second year of the Economics Tripos. Little more than a year later, I was elected to a research fellowship at Fitzwilliam House and a year after that (1967), when the Director of Studies in Economics at Fitzwilliam (by then Fitzwilliam College) was made Senior Tutor, I took over as Director of Studies to the 49 students then reading economics in the College. In the same year, I was asked to take on a course of lectures on Micro Economics for final year Engineering students studying Industrial management (a very bright group), and the following year (1968–9) I took over the Company Finance course for Part II of the Economics Tripos, replacing Geoff Harcourt, who had returned to Australia. Preparing these courses was very educational for me, although the students may have felt that I lacked experience. However, I still meet the occasional aging investment banker (usually now retired) who claims to have attended my lectures in Cambridge, and some even claim to have learned from them, but

memory can play curious tricks. What is certain is that I found that teaching really is the best way to learn.

In the academic year 1970–71, having completed my Ph.D., I spent two terms at the LSE reinforcing my econometrics training and one term writing the book (1971) based on my thesis. I also raised funds from the Esmée Fairbairn Charitable Trust (which had funded the original project in 1962) for an extension to the research project from 1971, to add further years of data and extend the analysis. As a result, in 1971, I became a Senior Research Officer in the DAE, but I stayed in the post for only one year, because in 1972 I was appointed to the Chair of Accountancy and Finance at Edinburgh University. As the only member of the Cambridge Economics Faculty who would confess to being a chartered accountant (in fact, Charles Feinstein, who subsequently became Professor of Economic History at Oxford, was a South African chartered accountant, and Cliff Pratten, widely known for his research on economies of scale, and, more recently, the stock market, was an English chartered accountant) I was sent most of the books on accounting received by the Economic Journal (which was then edited from Cambridge) to review or note. As time went on, these books seemed to me to become more interesting, particularly in their use of ideas from economics and the emerging sub-discipline of corporate finance. As I was currently lecturing on corporate finance and finance featured in the (newly cast) title of the Edinburgh chair, this seemed to offer the opportunity of linking my accounting origins to my more recent interests in economics.

My stay in Edinburgh was relatively brief (3 years, 1972–5), but eventful. The Esmée Fairbairn research grant was transferred there, and Geoff Meeks was employed as a full-time research associate to work on the project. Geoff was a young Cambridge economics graduate who had decided to relinquish the accounting profession after one year with a "Big 8" (as they were then) accounting firm. We produced several joint papers, which were essentially a continuation of the empirical work on the database that I had planned in Cambridge. Additionally, Geoff completed a Ph.D. thesis, which I supervised, which used the database to study post-merger performance and was the basis of his book (1977), which became a standard reference on the subject. We also produced a statistical report on company financing patterns, commissioned by the Royal Commission on the Distribution of Income and Wealth.

Apart from empirical work on the database, Edinburgh drew me into financial accounting, my first efforts being a brief paper on deprival value (1974) and a review article on Will Baxter's book on *Accounting Values and Inflation* (1975), both published in *Accounting and Business Research*. As a Professor, I was expected to do the introductory lectures in accounting, and, many years later, these became the basis of a textbook (1992). I had inherited only two members of staff from my predecessor (Eddie Stamp) and one of these (Tom Lee) left after a year (to a chair at Liverpool). On arrival in Edinburgh, I recruited Colin Jones and David Tweedie as lecturers and, two years later, John Forker and Irvine Lapsley were appointed; all have gone on to distinguished careers (three as full-time professors, and David Tweedie, of course, as a pioneering standard-setter), and they formed a stimulating group. David Tweedie became my co-author and collaborator in research for many years to come.

The other important aspect of the Department of Accounting and Business method, as our small department was known, was teaching. I resisted the overtures of the Institute of Chartered Accountants of Scotland (ICAS), which wanted us to offer the Diploma course,

a new component of their professional training, although I developed a relationship with and respect for ICAS which has proved to be lasting. The reason for rejecting the Diploma (which was offered in Edinburgh by Heriot-Watt University) was lack of teaching resources, and a decision that the development of honours courses (fourth-year undergraduate courses) in accounting should be a priority. Joint honours courses with the Economics and Business Studies departments were approved by the time I left in 1975. An account of the work of the Department at that time was given in my article in *The Accountant's Magazine* (1975).

In 1975, I moved to the Chair of Accounting and Finance in the Department of Economics at Bristol University. The academic attraction was being in a good economics department, several of whose members had been my colleagues in Cambridge, and which would span my interests in economics and accounting (the relationship between the two subjects was explored in an early paper written in Bristol, 1977). There was a small but good accounting group within the Bristol department, the senior member being Don Egginton, a deep thinker about accounting, from whom I was to learn a great deal.

The computing facilities at Bristol were not, in those days, suitable for the database work, so the move to Bristol marked the end of my direct involvement in the management of the database, although I continued to use it for research purposes, from time to time. Geoff Meeks moved to Cambridge and continued to manage and update the database until the government statisticians finally abandoned the data gathering work (Meeks, Wheeler and Whittington, 1991). A reduced commitment to empirical research may seem to be an odd decision at this particular time, when it was becoming the prominent paradigm in the USA, following the pioneering work of Ball and Brown (1968), Beaver (1968) and others in the USA. However, on a practical level, the database had a severe deficiency from the perspective of accounting research: it did not contain share price data, which are an essential ingredient of market impact studies. It was only later that the availability of share price databases and improved computing capacity for the combination of databases made such research easier in the UK. However, there was also a question of motivation: I was more interested in areas of accounting research that involved a different paradigm. At Bristol, I explored some of the fundamental properties of accounting data that had intrigued me when I was conducting my earlier empirical research in an industrial economics paradigm. These included the properties of accounting ratios and the significance (if any) of that much-cited measure, the accounting rate of return. I was also intrigued by the central issue of financial reporting in the late 1970s, inflation accounting. From 1979 to 1981 I took leave from Bristol to take up an ESRC Research Fellowship in Inflation Accounting. This enabled me to write two books, one (1983) surveying the theory of inflation accounting and the second (1984), co-authored with David Tweedie, tracing the history of ideas and the professional debate on the subject. I also wrote a number of shorter papers on the subject. I discovered that I enjoyed tracing the history of ideas in accounting and surveying and critiquing the literature, and, at about this time, I started writing papers of this type, usually for *Accounting and Business Research*, encouraged by its editor, Bob Parker.

I also became involved in various activities outside the University which had a bearing on my research interests. From 1975 to 1978 I was a member of the Meade Committee on Direct Taxation, sponsored by the Institute for Fiscal Studies (IFS), and was a co-signatory of its report (1978), the principal author of which was Professor James Meade,

a Nobel Prize-winning economist. This reinforced an interest in taxation which dates from my first published paper, co-authored with Geoff Harcourt (1965) and continues to the present. The membership of the Committee included some very bright young economists (now a little older: one is currently Governor of the Bank of England), and working with them was yet another educational experience. Subsequently, I became a part-time consultant to the Office of Fair Trading which was conducting enquiries that led to the "Big Bang" (the abolition of minimum commission scales and of the jobber/broker separation) on the London Stock Exchange. This again was a fascinating educational experience but, unfortunately, it was covered by the Official Secrets Act, so it led to no publications. The case was settled out of court, so I did not have to appear as an expert witness: a source of great relief, because I did not feel very expert. My apprenticeship in accounting standard-setting also started in this period. I became a member of the Institute of Chartered Accountants in England and Wales Technical Committee in 1978 and remained so until I became associated with the Accounting Standards Board in 1990.

In Bristol, we had some very bright students reading for the Economics and Accounting degree. They were much sought after by professional firms and tended to do very well in their professional exams and their subsequent careers. I suspect that this was due as much to their ability and motivation as to the value added by their university course, but the same argument applies to the graduates of most "good" universities, including Oxford and Cambridge: employers value the branding implied by being admitted to the university more than the skills learned subsequently at the university. Nevertheless, we did try to treat our students well, and this was time-consuming. A source of regret was that there were few opportunities to teach graduate students: the attractions and financial inducements of professional accounting ensured that none of our bright under-graduates wished to stay on for post-graduate work. My only Ph.D. student in the thirteen years spent at Bristol (1975–88) was a member of staff, Ian Davidson, who did some very interesting empirical work in finance and went on to become a professor at Warwick, and then Director of the Loughborough Business School.

I had to atone for my two years' leave on the ESRC Fellowship by taking my turn as Head of the Economics Department for three years (1981–4) and then as Dean of the Social Science Faculty for two years (1985–7). Although these were necessary and useful roles, I made the mistake of becoming deeply involved in university affairs and not doing them quite badly enough to be never invited again to take on a similar role. I also found that, in unguarded moments, I was starting actually to enjoy university politics and administration, which was not what I had joined the University to do. Also, in 1987, I was appointed as a part-time member of the Monopolies and Mergers Commission for a three-year term (subsequently serving for the maximum of two more terms, leaving in 1996). I found this fascinating. It involved field visits, interviewing directors and senior managers, hearing evidence from parties, and digesting much written evidence, including accounts and budgets, and analysing all of this in the context of competition theory. The trouble was that it was extremely absorbing, and if I allowed that to be combined with an involvement in administration as well as teaching, there would be no time left for research. Thus, after thirteen enjoyable years in Bristol, a move was called for, and two opportunities presented themselves. Perhaps inevitably, I chose to move back to Cambridge.

The Chair at Cambridge was located in the Faculty of Economics and Politics and was funded by Price Waterhouse (later PricewaterhouseCoopers) for ten years (later extended). Its purpose was to support the new M.Phil. in Finance, which included an important accounting component, there being no undergraduate accounting teaching in the Faculty. It thus enabled me to concentrate on teaching at a graduate level, including a limited number of Ph.D. students, the first of whom was Gishan Dissanaike, now a Reader in the Judge Institute of Management Studies at Cambridge, and the last of whom was Richard Barker, now Director at the Cambridge MBA programme. Although I hoped also to establish undergraduate courses in accounting, I realised that the Faculty was not very keen on the idea that accounting was a serious academic subject and that it had accepted the Chair mainly because it was a free good. I did initially persuade the Faculty to accept a small accounting component in the first year of the Economics Tripos, but efforts to extend this were always voted down and eventually there was even pressure to reduce the accounting components of the M.Phil., in the cause of making it a more appropriate vehicle for technical economists. Thus, I transferred the M.Phil. in Finance to the more supportive environment of the recently established Judge Institute of Management Studies, which by then had two lecturers in accounting and two in finance, who were my former graduate students. Geoff Meeks has since transferred from the Economics Faculty to become the first Professor of Accounting in the Judge Institute. Thus, the vision of creating an academic base for accounting in Cambridge was fulfilled by the time I left in 2001, to join the International Accounting Standards Board, although the location was not the Economics Faculty, as I had originally hoped.

Cambridge did enable me to combine research with my increasing external commitments. The economists did not want me to teach too much (except as a supernumerary economist, which I always resisted), and they would have been horrified at the thought of an accountant running the Faculty, so I was exempt from head of department or dean roles. This was all very welcome and was a large part of my motivation for leaving Bristol. I was therefore able to continue as a member of the Monopolies Commission for the maximum term (ending in 1996) and to join the newly-formed Accounting Standards Board (ASB), first as Academic Advisor (1990–94) and later (1994–2001) as a full voting member. The ASB enabled me to work once again with David Tweedie and provided a unique opportunity to put academic ideas into practice. Like most of my extra-mural activities, it was another highly educational experience.

Cambridge also provided excellent research infrastructure. Together with Paul Grout and Ian Jewitt, economists who had been my colleagues at Bristol, I was awarded an ESRC research grant to study regulation of professions, particularly accounting and auditing. Chris Pong, a Lancaster Master's graduate in Finance, was appointed as a Junior Research Officer in the DAE and proved to be extremely adept not only at computing and statistics, in which he had a good training, but also in archival research, which must be attributed to good natural ability. As a result, we produced several joint papers, based on empirical research on the audit market, the archives of the Auditing Practices Committee and the archives of the Accounting Standards Committee, as well as a more theoretical paper co-authored with our Bristol colleagues (Grout, Jewitt, Pong and Whittington, 1994).

As a result of my work on the Monopolies Commission (particularly the British Gas Report of 1993) I became very interested in the regulation of privatised industries,

particularly the relationship between the accounts and financial targets. I wrote several papers on these issues, and my thoughts were clarified by discussion with David Newbery's research group on regulation in the DAE. I also resumed collaboration with my old colleague from the 1960s, Ajit Singh. This led to an empirical study of Turkish companies, adjusting their accounts for inflation, using an estimation algorithm which I derived from the Brazilian method of inflation accounting (Whittington, Saporta and Singh, 1997). The results were surprisingly plausible. Another strand of empirical work was with Mark Tippett, with whom I pursued a long-term interest in statistical properties of accounting ratios. The most recent paper in this series analysed accounting ratios as being comprised of co-integrated variables (Whittington and Tippett, 1999). The idea of applying co-integration techniques to accounting ratios originated in a game of squash with Kevin Lee (then a member of the DAE research staff and now Professor of Econometrics at Leicester). Gasping for breath against a younger opponent, I decided that the only way to obtain respite without showing weakness was to ask Kevin about his current research; it was on co-integration and his admirably clear account of the problem made its relevance to accounting ratios obvious.

Thus, at the end of my period at Cambridge, I had a portfolio of research interests, some theoretical and some empirical (and some not mentioned here but apparent from the full list of publications). They were possibly too diverse to lead to profound insights, but I enjoyed the diversity, and they reflected a diverse range of outside interests. One larger project, first planned in 1987, but not yet achieved, was to revise my introductory book on the theory of inflation accounting (1983). This book was really about measurement in accounting, not merely inflation adjustment, and there is much new material that needs to be covered, not least the emergence of "fair value" as a measurement objective favoured by some standard-setters. This is now a retirement project, due to commence in 2006.

In 2001, I left Cambridge to become a full-time member of the International Accounting Standards Board for a five-year term. This was a natural development of my membership of the ASB and a unique opportunity to be involved in the creation of a new organisation which will hopefully become a lasting element in accounting regulation worldwide. It provided a new stimulus which I probably needed, having spent 13 consecutive years in Cambridge and established accounting there in safe hands. However, it does not spell an end to thinking and writing about accounting. I have several current projects, including a paper on the relationship between fair value and value to the business (with Tony van Zijl), and, in the future, the book should ensure an active retirement.

A guide to the selected papers

I *Empirical studies based on company accounts*

The papers in this section are all the result of my early work on the Cambridge database of company accounts. In these, the central concern was to analyse the structure and evolution of the UK company sector, using the contemporary models of industrial economics and the theory of the firm.

The first paper, co-authored by Ajit Singh, analyses the size and growth of listed companies, using as a framework the Law of Proportionate Effect (sometimes known as Gibrat's Law). This type of framework had been used by earlier researchers, such as Steindl and Hart and Prais in the UK and Simon and Bonini and Simon and Ijiri in the USA, but our data coverage was much broader and we explored a number of aspects of the dynamics of the company population more thoroughly than our predecessors. Growth theories, both of the macro economy and of the firm, were much in vogue at the time, but these were supported by little empirical evidence. We were able to show that Gibrat's Law did not hold in its strict form: larger firms grew, on average, at slightly faster rates than small firms (Gibrat's assumption was that growth rate was independent of size), and this was primarily due to greater temporal persistence of growth in large firms. This raised the prospect that industrial concentration would increase as large firms grew even larger, in relative terms. We also found that (contrary to the Gibrat assumption) there was less dispersion of growth rates amongst large firms.

The second paper, although published rather later, illustrates the parallel studies that I conducted on the relationship between firm size and profitability (measured as the accounting rate of return). The average profitability of firms (like growth, with which it was closely correlated) was substantially independent of firm size, but there was (in contrast with the size/growth relationship) a weak negative relationship between profitability and size, indicating a slight tendency for smaller firms to be more profitable. This relationship could, of course, have been a product of the accounting practices of smaller firms rather than an economic reality. I also found that (as in the case of growth) the profitability of larger firms was less variable, both between companies and through time. Using the Dupont ratios (Profitability/Sales and Sales/Assets), I was able to show that the relative temporal stability of profitability of larger firms was due to an ability to maintain stable profit margins rather than stable levels of sales relative to the assets. This was consistent with the exercise of market power.

The third paper is an extension of another strand of my empirical work on profitability, the study of its persistence through time. I found (in my Ph.D. theses and the 1971 book) that the relative profitability of firms persisted, on average, over two six-year periods, but that it provided a classic example of what Galton originally described as "regression towards the mean", i.e. the regression coefficient (Galton's original term, used to relate the heights of parents to the heights of their children) was less than one. Thus, aboveaverage profitability (for the population) in one period would be associated (as measured by the regression coefficient) with above-average profitability in the next, but not by as much as previously. Thus, profitability would regress towards the mean of the population at a rate measured by the regression coefficient. When Baumol, Heim, Malkiel and Quandt (BHMQ) produced an interesting paper on the relative profitability produced by different sources of finance, I realised that their results were potentially flawed by the lack, in their model, of a prediction of what profitability would have been without the additional finance. I was able to use my "regression" model to remedy this deficiency and the Cambridge database to provide additional (UK) empirical evidence. My results were broadly consistent with BHMQ, confirming that external finance was used more profitably than internal finance, but my results suggested that it was the *event* of raising external finance, rather than the amount raised, that improved profitability.

The final paper in this section marks my collaboration with Geoff Meeks in Edinburgh. It considers the issue of the financial incentives of directors, a matter that received increasing attention in later years, as concerns about corporate governance developed. We were concerned, in the context of managerial theories of the firm, with the extent to which directors' remuneration was determined by the growth or the profitability of their firms. We concluded that both had some impact, but that the effect of growth was the greater. Thus, there was a possible incentive to grow firms beyond the level that would be optimal in terms of profitability.

II *Specification of empirical models*

An essential ingredient of empirical work is to have a well-specified model and understand its assumptions and properties. For that reason, I have always been bemused by the claims of Watts and Zimmerman (see Section VI, item (2)) who seem to believe that there is a clear distinction between "positive" accounting theory, based on empirical research, and "normative" theory, which is in some sense non-scientific and subjective. We always approach data with some form of theoretical model in mind: even taxonomy is based upon some prior belief about what is a relevant category, and it is impossible even to describe without some form of taxonomy, and hence some form of theory. Theories may be derived by deduction from assumptions or by induction from experience and observation. Most often they are a product of both: the practical process of advancing knowledge is much less tidy than manuals of scientific method might suggest. In the case of Watts and Zimmerman, the empirical research models which they favour (broadly, market reaction models) are based upon various economic theories that might well be categorised in their terms as "normative". These include assumptions such as maximising behaviour and market efficiency. They are not unreasonable assumptions, but they do impose limitations on what we can learn from testing the models empirically, and it is important that their implications are understood. For this reason, I have always been particularly interested in the specification of empirical models, and this section contains a sample of papers demonstrating this.

The first paper in this section is a brief note dealing with market efficiency. In 1976, Colin Jones, David Tweedie and I published a paper testing the so-called "regression portfolio". This was a method of selecting a portfolio which should yield an above-average return, which I had proposed in the final chapter of my 1971 book. The method was based on two single rules, select shares of companies with below-average profitability (because regression to the mean would raise it in the future) and with below-average price/earnings ratios (because the research of Little and Rayner had suggested that P/E ratios had no predictive content; hence cheap current earnings, indicated by a low P/E, were better value than expensive ones). The tests in our 1976 paper yielded only very weak support for this as a stock selection device, although it did uncover some other interesting issues and results, such as the fact that by far the best way to construct a profitable portfolio would be to choose shares of companies that would be taken over (if that could be predicted), despite the evidence that most take-overs were not very successful (hence, the shareholders of the acquiring company would pay the cost).

The paper attracted the attention of Ken Peasnell and Len Skerratt and they published a note interpreting it as a test of the Efficient Markets Hypothesis. The first paper in this

section is my reply. This enabled me to make three points which were not well understood at the time. First, that the Efficient Markets Hypothesis (EMH) is strictly untestable because there is an infinite number of alternative models. Second, that testing the EMH is a test of a null hypothesis: hence the usual statistical procedures are weighted against rejection. Third, the EMH, as usually specified, relates only to informational efficiency, not to "fundamental" efficiency, i.e. efficiency in reflecting the value of fundamental valuation attributes such as the capacity to pay future dividends. Since that time, thanks to the work of Ohlson in particular, the third of these points is now much better understood.

I was also pleased, on returning to Cambridge in 1988, to return to some of the ideas of the regression portfolio when I supervised Gisham Dissanaike's Ph.D. thesis on what are now described as "contrarian models". Gishan has accumulated a collection of published work on the subject which has a sophistication and depth far beyond our aspirations in 1976.

The next paper discusses the use of the accounting rate of return in empirical research. Having used accounting rates of return extensively in my empirical work, I was interested to understand the uses and limitations of this measure, especially as I was fully aware that the choice of accounting policy could affect both the numerator and the denominator of the rate of return. I read widely the literature of the subject and by far the most clear and elegant paper that I found on the subject was by John Kay in *Oxford Economic Papers*, 1976. This was little known to accountants and I tried to explain his results to them in the second part of my paper. I did not entirely succeed because Ken Peasnell was already working independently on the same problem and proved many of the same results (using discrete mathematics rather than the continuous mathematics used by John Kay, which was more elegant but less accessible) in a paper published in *The Journal of Business Finance and Accounting* (1980), so that the Kay paper has never received the attention that it deserved from accountants. The essential achievement of the Kay and Peasnell papers was to show the precise mathematical relationship between the accounting rate of return and the economist's internal rate of return, which is used in capital budgeting. A broader survey of the debate on the accounting rate of return, which covers the later work of Fisher and McGowan and of Edwards, Kay and Mayer, is provided in the following paper in this section, which was originally my contribution to a *Festschrift* for Geoff Harcourt. Geoff was not only the co-author of my first published (third) paper but his celebrated paper "The Accountant in a Golden Age" first stimulated my interest in the significance of the accounting rate of return.

The first part of my earlier (1979) paper considered the possible use of the accounting rate of return in economic models as a proxy for the "true" return. This demonstrated that the accounting rate of return could be used without generating bias in quite plausible circumstances, although my algebra contained an error (not fatal) which was drawn to my attention by Len Skerratt: our joint correction is appended to the paper.

The paper on the basic properties of accounting ratios also arose from my interest in the properties of the variables that I was (together with many others) using in empirical research. It seemed obvious to me that a ratio is equivalent to the linear regression of the numerator on the denominator, with the constant term set to zero, but many academic colleagues seemed to be bemused by this. The consequence of looking at ratios this way is that we have to consider whether the specification is correct: should the slope be linear

and should the constant term be forced to zero? I address these issues in the paper, which gave me an excuse to visit the Physics Library in Bristol to read the Proceedings of the Royal Society, which record classic debates between Galton, Pearson and others on ratios, regression and related subjects. The paper is now much cited, but I had great difficulty in getting it published (an American journal rejected it because it read "like notes for a Master's course"). It was therefore written long before the publication of the paper by Lev and Sunder (1979), which is often cited as an earlier source of these ideas (although, no doubt, Lev and Sunder also had their problems with editors).

I followed up my interest in accounting ratios in two empirical papers with Mark Tippett. The second, which is the one to which I contributed most, tests accounting ratios for cointegration and is included as the fifth paper in this section. The idea came, as already explained, from a discussion with Kevin Lee. The paper explains the problems of non-stationarity and the implications of cointegration. These are now widely known and applied in time series analysis by econometricians, but they are less apparent in the empirical accounting literature, so the paper may have been useful as dissemination. As a piece of research, the idea that ratio transformation might eliminate non-stationarity in accounting data was an original suggestion but unfortunately it was not supported by the particular data that we chose. We did find that non-stationarity existed in the underlying accounting variables, but its consequences were not neutralised by cointegration. However, it is to be hoped that others will pursue this line of research further, using different data and possibly different ratios.

The paper with Chris Pong on the determinants of audit fees is included here because I paid particular attention to the specification of the models (possibly too much, as I remember even Chris's usual good humour and patience being stretched by requests to estimate yet another specification, when we already had interesting results). In particular, the paper addresses the standard econometric problem, rarely discussed in the accounting research literature, of identification (are we observing, in market price data, the supply curve, the demand curve or a garbled mixture of the two?). It also made the rather obvious point (p. 1075) that logarithmic transformation should not be done casually as a data-fitting device, because logarithmic transformation of the dependent variable changes the fundamental meaning of the model, by making the relationship between the explanatory variables multiplicative rather than additive (adding to a logarithm multiples the natural value of the underlying variable). I made the mistake (in the light of my previous experience with the ratios paper) of submitting this paper to a distinguished American journal. I was not surprised that the paper was rejected, but I was amazed that one of the reasons given by the editor (famed for his empirical research) was that he did not understand the point about logarithmic transformation.

III *Price change accounting*

Inflation was the most pervasive problem in all market economies in the 1970s and into the early 80s, when more rigorous macro-economic management began to control it. By now (2005), hyper-inflation is virtually non-existent in the world, and inflation is at historically low levels (at least by twentieth century standards) in all advanced economies. Against this background, it is not surprising that inflation accounting was the

most controversial and urgent issue in financial reporting in the 1970s and that interest in it subsequently fell away rapidly.

As someone interested in economics and accounting, the relationship between the two, and the use of accounting data for economic research, I naturally saw inflation accounting as something that I should try to understand. During my two-year ESRC research fellowship, I produced two books (the second, jointly with David Tweedie) and wrote many papers on the subject, so only a very small sample is offered here. The rapid decline of the subject (as predicted with remarkable accuracy by Michael Mumford) left my expertise in the subject less useful than I might have hoped, but the experience taught me two valuable lessons.

First, it taught me that accounting is a practical activity and that reforming it (as opposed to abstract analysis) has to be done in the context of the needs of the time, particularly the capacities of users and preparers of accounts (which are constrained by their historical inheritance) and the economic and institutional environment (which determine the incentives and benefits of different forms of accounting). For this reason, as a member of the International Accounting Standards Board, I am less ready than some of my colleagues to assume that an accounting method that is consistent with our conceptual framework is necessarily suitable for immediate implementation in a standard.

Second, I realised that "inflation accounting" is about more than inflation. The pressures of inflation put the existing accounting model under stress and revealed some fundamental weaknesses that need to be addressed, particularly in the area of measurement. Inflation exposed the potentially misleading properties of historical cost, the traditional measurement base, and the lack of clarity in how profit is defined and measured. These issues are still important in a period when pure inflation is not seen as a serious problem. Hence, when I re-write my 1983 book, it will be about accounting measurement rather than inflation accounting, but much of the basic material will be the same.

The first paper in this section originated in a talk that I gave to the Bristol Society of Chartered Accountants at the invitation of David Parkes (then Senior Partner of Thomson McLintock in Bristol). David was the creator of "Fred", the central figure in the paper, which was a public lecture given at University College, Cardiff. I subsequently used this material in the first chapter of my 1983 book. It attempts to clarify the basic alternative models of accounting for changing prices that were being debated hotly (but poorly understood) at the end of the 1970s. In particular, it distinguishes the effects of individual prices from those general inflation and draws attention to the importance of defining an appropriate concept of capital maintenance in order to measure profit.

The second paper, a plenary address given to the European Accounting Association, reflects the interest in the history of ideas which I developed in working on the study of the debate on inflation accounting. I was fascinated to read the early work of Schmalenbach (whose *Dynamic Accounting* was available in an English translation), Schmidt (who published a limited number of papers in English) and Limperg (who published nothing in English, although his followers did). I was particularly interested in the latter two, because it was fairly clear that Schmidt was the first to propose a form of current cost accounting. He even developed a gearing adjustment and was also the first to propose that historical cost accounting could amplify economic instability over the trade cycle. Limperg, much revered as a founder of the Dutch auditing profession, was

substantially self-taught and started to publish later; he differentiated his model from that of Schmidt by stressing the importance of replacement *value* (similar to deprival value) rather than replacement *cost*. I came to the conclusion that Schmidt's contribution was considerably under-rated, partly because of Limperg's somewhat intemperate criticisms (which I was able to access with the help of my Dutch colleague, Professor Willem Buiter, a distinguished macro-economist who became chief economist of the European Investment Bank) and partly because he lost political favour in post-war Germany. All of this taught me that it is not only practical accounting that is constrained by history and the current environment: ideas too need favourable circumstances in order to take root. It also taught me how many valuable ideas are hidden in neglected earlier literature. Others have since done further studies of Schmidt and Limperg, but I hope some day to be able to read more of their work, even if this means learning German or Dutch.

The survey of the inflation accounting debate, written with David Tweedie, was mainly about the contemporary history of the debate of the 1970s. The final paper in this section completes this story by tracing the decline of current cost accounting in the early 1980s. The paper was a contribution to a *Festschrift* for Bob Parker, a long-standing friend, colleague and most creative editor.

IV *Taxation and regulation*

Taxation, particularly corporation tax, has been a continuing interest since I published my first paper (in 1965) on corporation tax. This interest has spanned the economics of taxation, the suitability as a tax base of accounting profit measures, and how corporation tax should be reported in accounts. My most active involvement in taxation was as a member of the Meade Committee (1975–7), and the first paper in this section is a public lecture which presents the main conclusions of its Report (1978). The core of the proposals was that UK direct taxation should be moved to an expenditure basis, which can be achieved by having income taxes with deductions for saving, and additions for dis-saving. This would reduce the disincentive to save and invest that would exist under a pure "comprehensive" income tax. Our investigations showed that the contemporary UK system had a series of complex reliefs that led to some transactions receiving multiple reliefs for saving and investment and others none at all. Since that time, there have been reforms of the UK tax system which are, in many ways, consistent with the Meade proposals, although these proposals were never formally adopted by any government and they have certainly not been fully implemented.

My membership of the Monopolies Commission led to an involvement in the regulation of privatised industries. I was particularly intrigued by the use of current cost accounting in this context, and sometimes its attempted misuse by regulated companies to enhance their allowed returns. Equally, I was interested in the assessment of the cost of capital, which was another element in assessing the rate of return to be allowed. I published several papers relating to these issues and the second paper in this section is a representative example. It discusses the problems of assessing both the regulatory asset base and the rate of return. An important issue was the double counting of the current cost depreciation adjustment. If the appreciation of the assets was not included in the returns of the business, then its subsequent depreciation should not be deducted from profits, for regulatory purposes: otherwise the profits would be under-stated and the price

set by the regulator would be too generous. I identified this problem in the 1993 British Gas enquiry but failed to persuade my fellow panel members to support me. It has always been a source of regret to me that I did not write a minority report on this issue, rather than allowing it to be obfuscated.

V *Regulation of accounting and auditing*

When I qualified as an accountant, accounting standards were unknown. In 1972, when I succeeded Eddie Stamp in the Chair at Edinburgh, he had been the main catalyst in the formation of the Accounting Standards Steering Committee (1970). Shortly after moving to Bristol, I became a member of the ICAEW Technical Committee, which was responsible for advising the Institute's Council as to whether it should endorse the publication of standards proposed by the (newly titled) Accounting Standards Committee. Thus I was drawn into the standard-setting process and eventually began commenting on and researching the process, first in the area of inflation accounting (see Section IV) and later more generally, particularly as a result of the project involving Paul Grout, Ian Jewitt and Chris Pong in the early 1990s.

The first paper in this section is a review of the Solomons and Dearing reports, which were published in 1988 and 1989 respectively. It recounts the contemporary pressures on the accounting setting process and praises the Dearing Report as a pragmatic solution to the problems, which it certainly was, but noting some fundamental questions which it avoided. Sir Ron Dearing, ever a pragmatist, would probably have been pleased with this judgement; indeed, he probably was, because he invited me to become Academic Advisor to his new Accounting Standards Board (but this possibility had not occurred at the time when I wrote my review!). The Solomons Report is also welcomed as providing a possible framework for determining the form and content of accounting standards (which Dearing had ignored), but attention is drawn to the limitations of both the assumptions of the framework and the inferences that could be drawn from it.

The next paper in this section, co-authored by David Tweedie, was, in retrospect, a more important one than it seemed at the time. We were trying to survey the current abuses of creative accounting and to suggest what general issues needed to be addressed by accounting standard-setters in order to prevent these abuses. We did not know that, within a short time (even before the paper appeared in print), David Tweedie would be Chairman of a new Accounting Standards Board and we would both be involved in its first decade of work. This paper summarises our perceptions of the problems and directions for solution at the start of that decade, and its concerns were reflected in the ASB's subsequent agenda.

The following paper puts the regulation of accounting and auditing in the context of corporate governance. It addresses the need for regulation and the different properties of regulation by the public sector and the private sector (the latter being sub-divided into professional self-regulation and broader-based private sector regulation). Its conclusion about the regulation of auditing, that it would need to be distanced from control by the potentially self-interested auditing profession to a more independent body, is consistent with the recent (2004) transfer of the Auditing Practices Board and the oversight of auditing to the Financial Reporting Council. More fundamentally, the message of the paper is that the form of regulation must be consistent with the imperfections in the

market that created the need for regulation. It concludes that "self-regulation is unlikely to be more than a transitory stage in the evolution of regulation".

Per Thorell, a Professor of Law at the University Uppsala, who was involved in drafting the Swedish commercial code, dealing with the content of accounts, was a visitor in Cambridge in the academic year 1991–2. The next paper is an outcome of our exchange of views during this visit. We described the current state of harmonisation of accounting within the European Union (EU) and its relationship to the evolving international role of the IASC. Despite our different national and professional perspectives, we reached a common conclusion, that it was important for the EU to work with the IASC, rather than competing with it, particularly in setting accounting standards for listed companies. The subsequent (2000) decision of the EU finance ministers to adopt international accounting standards for listed companies was therefore consistent with our recommendations, although unlikely to have been a direct result of them.

VI *Surveys and methodology*

It is perhaps a fault in a modern academic to enjoy reading and critiquing the work of others as much as writing up one's own research. This activity is often described as "scholarship" and is accorded a lower status than research. If it is a fault to enjoy it I must plead guilty; perhaps I am not a modern academic.

This section begins with two representative papers of this type. The first, a survey of financial accounting theory, was commissioned by the British Accounting Review as the first of a series of surveys. I am told that it still sells well, in terms of requests to photocopy, so it is included here despite being a little out of date. In it, I used the analogy of geology to explain the layers of accounting thought that can still be identified. Anthony Hopwood later used the analogy of archaeology for classifying accounting: this preserves the idea of stratification but is a much better analogy because it embraces the concept of accounting as a social activity, reflecting the social environment in which it exists. I must therefore confess to being a little mechanistic.

The second paper in this section is a critique of Watts and Zimmerman's influential work on *Positive Accounting*. Whilst acknowledging the originality and interest of Watts and Zimmerman's empirical approach to explaining choice of accounting method in terms of self interest, I was (and am) extremely critical of their rejection of alternative approaches to accounting research, particularly what they describe as "normative" theory, and of their neglect of the "normative" theoretical underpinnings of their own approach.

The final paper in this section is a public lecture that I gave at Aberystwyth in 1995. It provides a perspective on the state of the accounting profession and of academic accounting at that time. It is written with a light touch, but the views expressed were sincerely held. It is tempting to look back over the last ten years and consider whether subsequent events have changed my views (e.g. the "Big Six" accounting firms are now the "Big Four"). However, this introduction has already detained the reader too long, so, in the popular cliché, "I leave it to others to judge…".

G.Whittington: Publications (to October 2005)

I Books

(1) (with A.Singh), *Growth, Profitability and Valuation,* Cambridge University Press, 1968.
(2) *The Prediction of Profitability, and other studies of company behaviour,* Cambridge University Press, 1971.
(3) *Inflation Accounting: An Introduction to the Debate,* Cambridge University Press, 1983.
(4) (with D.P.Tweedie), *The Debate on Inflation Accounting,* Cambridge University Press, 1984.
(5) (edited, with R.H.Parker and G.C.Harcourt), *Readings in the Concept and Measurement of Income,* Philip Allan, 1986.
(6) *The Elements of Accounting, An introduction,* (Cambridge University Press, 1992)

I was also a signatory of the Meade Committee Report, *The Structure and Reform of Direct Taxation* (George Allen and Unwin, 1978), the principal author of which was Professor James Meade.

II Pamphlets and Chapters in Books

(1) *Company Taxation and Dividends,* Institute for Fiscal Studies (IFS Lecture Series, No. 1), 1974.
(2) (with G.Meeks), *The Financing of Quoted Companies in the United Kingdom,* Royal Commission on the Distribution of Income and Wealth, Background Paper No. 1, HMSO, 1976.
(3) "Accounting and Economics", Chapter 12 (pp. 192–212) of *Contemporary Issues in Accounting,* eds. B.Carsberg and A.Hope, Philip Allan, 1977. (Revised for the second edition, 1984).
(4) "The Reform of the UK System of Direct Taxation", in *The City-Association Accounting Lectures, Spring 1978,* The Certified Accountants' Educational Trust and The City of London Polytechnic, 1978.
(5) "The Direct Tax System", Chapter 9 (pp. 156–171) of *Taxation and Social Policy,* eds. Cedric Sandford, Chris Pond and Robert Walker, Heinemann Educational Books, 1980.
(6) "The British contribution to income theory", Chapter 1 (pp. 1–29) of *Essays in British Accounting Research,* eds. Michael Bromwich and Anthony G.Hopwood, Pitman, 1981.

(7) "Inflation Accounting—What Next?", Chapter 5 (pp. 60–84) of *British Accounting Standards, The First 10 Years*, eds. Sir Ronald Leach and Professor Edward Stamp, Woodhead-Faulkner, 1981.
(8) *Inflation Accounting, All the Answers*, the Deloitte, Haskins and Sells Lecture, 1981, University College of Cardiff Press. Reprinted as pp. 57–72 of *Contemporary Issues in Accounting*, with an Introduction by Jack Shaw, Pitman, 1984.
(9) "The Role of Research in Setting Accounting Standards: the Case of Inflation Accounting", pp. 127–150 of *Accounting Standards Setting*, eds. Michael Bromwich and Anthony G. Hopwood, Pitman, 1983.
(10) "The European Contribution to Inflation Accounting", pp. 24–42 of *Congress Proceedings* of the Sixth Annual Congress of the European Accounting Association, University of Glasgow, 1984.
(11) "Capital Maintenance Concepts in Current Cost Accounting: Recent Developments in the United Kingdom", pp. 148–75 of Bryan Carsberg and Susan Dev (eds.), *External Financial Reporting*, Prentice Hall, 1984.
(12) "Inflation Accounting: Its Historical Development, the Recent Experience of the UK and Some Implications", pp. 1–25, *AAANZ Conference 1984*, Department of Accounting and Finance, University of Tasmania, 1984.
(13) (with D.P.Tweedie), *Capital Maintenance Concepts: the Choice*, Accounting Standards Committee, 1985.
(14) (with L.C.L Skerratt), "On the Use of the Accounting Rate of Return in Empirical Research: A Correction", pp. 156–9 of R.P.Brief (ed.), *Estimating the Economic Rate of Return from Accounting Data*, Garland, 1986.
(15) "Accounting and Changing Prices", pp. 62–73 of David Solomons (ed.), *Standard Setting for Financial Reporting*, Peat Marwick Main & Co., 1987.
(16) "Accounting and Economics", pp. 11–14 of John Eatwell, Murray Milgate and Peter Newman (eds.), *The New Palgrave, A Dictionary of Economics*, Vol. 1, Macmillan, 1987.
(17) "Inflation accounting", pp. 837–9 of John Eatwell, Murray Milgate and Peter Newman (eds.), *The New Palgrave, A Dictionary of Economics*, Vol. 2, Macmillan, 1987.
(18) "The valuation problem in contemporary financial reporting in the United Kingdom", pp. 151–178 of G.Macdonald and B.A.Rutherford (eds.), *Accounts, Accounting and Accountability*, Van Nostrand Reinhold (International) and The Institute of Chartered Accountants in England and Wales, 1989.
(19) "Reporting the Incidence of Corporation Tax", Chapter 5, pp. 67–85 of *Fiscal Policy. Essays in Honour of Cedric Sandford*, ed. David Collard, Avebury, 1989.
(20) (with G.C.Harcourt) "Income and Capital", pp. 186–211 of John Creedy (ed.), *Foundations of Economic Thought*, Basil Blackwell, 1990.
(21) "Financial Reporting—Proposals for Action", Chapter 7 (pp. 93–111) of J.A.Arnold, M.J.D.Cooper and J.C.Shaw (eds.), *Financial Reporting, The Way Forward*, The Institute of Chartered Accountants in England and Wales and The Institute of Chartered Accountants of Scotland, 1990.
(22) "The Valuation Basis of Financial Reporting: A Review of the Arguments", Chapter 4, pp. 93–115, of *The Future Shape of Financial Reports: Research Studies*, The

Institute of Chartered Accountants of Scotland and the Institute of Chartered Accountants in England and Wales, 1991.

(23) (with G.Meeks and J.M.Wheeler) "The Cambridge DTI Database", pp. 1–10 of J.L.G.Board, P.F.Pope and L.C.L. Skerratt (eds.), *Databases for Accounting Research*, The Institute of Chartered Accountants in England and Wales, London, 1991.

(24) "Accounting and Finance", Vol. 1, pp. 6–10, *The New Palgrave Dictionary of Money and Finance*, The Macmillan Press, 1992.

(25) "Depreciation", Vol. 1, pp. 633–5, *The New Palgrave Dictionary of Money and Finance*, The Macmillan Press, 1992.

(26) "Historical-Cost Accounting", Vol. 2, pp. 313–4, *The New Palgrave Dictionary of Money and Finance*, The Macmillan Press, 1992.

(27) "Inflation Accounting", Vol. 2, pp. 400–2, *The New Palgrave Dictionary of Money and Finance*, The Macmillan Press, 1992.

(28) "The LSE Triumvirate and its contribution to price change accounting", Chapter 14, pp. 252–73 of J.R.Edwards (ed.), *Twentieth Century Accounting Thinkers*, Routledge, 1994.

(29) *Is Accounting Becoming Too Interesting?*, Sir Julian Hodge Lecture, May 1995, The Registry, The University College of Wales, Aberystwyth.

(30) "Financial Statements and Performance Measurement", Part I, Chapter 2, pp. 7–17 of I.Lapsley and F.Mitchell (eds.), *Accounting and Performance Measurement*, Paul Chapman Publishing, 1996.

(31) "Inflation Accounting", Vol. 3, pp. 2058–2069 of M.Warner (ed.), *International Encyclopedia of Business and Management*, Routledge, 1996.

(32) "Accounting Standards: A Mixed Blessing?", Chapter 3, pp. 22–40 of I.Lapsley (ed.), *Essays in Accounting Thought: A Tribute to W.T.Baxter*, The Institute of Chartered Accountants of Scotland, 1996.

(33) "The Economic Rate of Return and the Accountant" Vol. 2, Chapter 9, pp. 97–108, of P.Arestis, G.Palma and M.Sawyer (eds.), *Markets, Unemployment and Economic Policy*, Essays in honour of Geoff Harcourt, Routledge, 1997.

(34) "Inflation Accounting" pp. 283–305 of Malcolm Warner (ed.), *Concise International Encyclopedia of Business and Management*, International Thomson Business Press, 1997.

(35) (with D.Tweedie), "The End of the Current Cost Revolution", Chapter 8, pp. 149–176 of C.W.Nobes and T.Cooke (eds), *The Development of Accounting in an International Context*, A Festschrift in honour of R.H. Parker, London: Routledge, 1997.

(36) (with V.Saporta and A.Singh), *The Effects of Hyper-Inflation on Accounting Ratios—Financing Corporate Growth in Industrialising Economics*, Technical Paper 3, International Finance Corporation, Washington DC, August 1997.

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Additionally, as a member of the *Monopolies and Mergers Commission*, I was a signatory of twenty published reports, each of which involved a significant input by me in framing questions, planning research programmes, debating issues and drafting. The most important of these were *Post Office Counters* (1988), *Supply of Petrol* (1990), *London Underground* (1991), *British Gas* (1993), *South West Water* (1995), BAA (1996), *Severn Trent/South West Water* (1996) and *Wessex/South West Water* (1996).

Section I
Empirical studies based on company accounts

The Size and Growth of Firms[1, 2]

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Reprinted from THE REVIEW OF ECONOMIC STUDIES, Vol. XLII (1), January, 1975, AJIT SINGH and GEOFFREY WHITTINGTON, pp. 15–26.

1. INTRODUCTION

This paper is a sequel to the analysis of the growth process of firms presented in Chapters 4 and 5 of our book *Growth, Profitability and Valuation* [17]. The relationship between size and growth of firms is explored using a more comprehensive set of data than was used in the book. In particular, the book was based on data relating to individual quoted companies in the UK in only three large industries, whereas, in this paper, we extend the analysis to cover all major industrial groups in manufacturing, construction and distribution.

The relationship between size and growth of firms, and particularly stochastic models based on the Law of Proportionate Effect or Gibrat's Law, have previously been studied by a number of economists other than ourselves (see among other [5,6,7,8,12,15 and 18]). Relatively few of these studies have used individual industry data. Industry is, however, an important variable, because the characteristics of the average firm vary significantly and systematically between industries (see [16]). Furthermore, none of the previous studies is based on as comprehensive a set of data as is the analysis presented below. The availability of data on such an extensive scale, showing the growth experience over the period 1948–60 of nearly 2000 individual firms, divided into 21 industrial groups, yields some interesting insights which have not been possible in earlier studies. It also leads to the revision of some important conclusions of our own previous study and of other similar studies.

[1] *First version received December 1972; final version accepted February 1974 (Eds.).*

[2] The results reported in this paper follow from a project carried out at the Department of Applied Economics, Cambridge, with the aid of a grant from the SSRC. The authors are grateful to Dr Hendry and the anonymous referees for their constructive criticism of an earlier draft of this paper.

2. SIZE AND GROWTH: SOME THEORETICAL CONSIDERATIONS

The relationship between the size and growth of firms in economic theory has traditionally involved the twin notions of the optimum size of the firm and industrial equilibrium. The former has been rigorously restated recently [21] in terms of certain propositions of organization theory, which has the additional advantage of being applicable to multi-product firms. However, even if there is an optimum size of the firm, the traditional theory unfortunately gives very little guidance as to the exact nature of the relationship between size and growth which one would expect to observe among a *cross-section* of firms, except in the trivial case of static equilibrium where by definition no firm would grow. Clearly, a cross-sectional relationship between the two variables will be observed only if some or all firms are not in equilibrium; its specific form would depend upon the causes of disequilibrium and the assumed speed of adjustment towards equilibrium.

Nevertheless, if all firms within an industry are assumed to face the same *U*-shaped long run average cost curve as postulated in traditional theory, it can be argued that one would expect to observe a negative relationship between firm size and growth among a cross-section of firms in the industry. This is because the large firms are assumed to be at or near their optimum size and would therefore have to grow very little and might even shrink if they exceeded optimum size. The small firms would be furthest below the optimum size and would need to grow at a faster rate to achieve this size.

In recent years, a number of economists have approached the problem of size and growth in a theoretical framework rather different from that of the traditional theory (see [11]). They argue that, in a modern corporation characterized by a divorce of ownership from control, salaried managers will be less interested in maximizing the profits (or stock market valuation) of the firm than in maximizing the rate of growth, to the extent that these two objectives conflict. It is further suggested that there is no limit to the absolute *size* of the firm as such, but that there does exist a limit to its *growth rate* per unit time. This particular framework indicates a positive relationship between size and growth on a cross-sectional basis. This is because, *ceteris paribus*, the larger the size of the firm, the more will it be expected to be managerially dominated, and the more, therefore, will it wish to grow, compared to a small firm which is likely to be owner-controlled and therefore less interested in growth *per se*.

The above two approaches in terms of economic theory clearly do not produce many testable hypotheses, but there also exists another way of looking at the relationship between size and growth which is a great deal more promising. In this view, growth is regarded as a purely stochastic phenomenon resulting from the cumulative effect of the chance operation of a large number of forces acting independently of each other. The economic motivation for this conception may be expressed as follows. The chances of growth or shrinkage of individual firms will depend on their profitability as well as on many other factors which in turn will depend on the quality of the firm's management, the range of its products, availability of particular inputs, the general economic environment, etc. During any particular period of time, some of these factors would tend to increase the size of the firm, others would tend to cause a decline, but their combined

effect would yield a probability distribution of the rates of growth (or decline) for firms of each given size. It is commonly asserted that this probability distribution is the same for all size-classes of firms. This is the well-known Law of Proportionate Effect [LPE], which has attracted a great deal of attention in the literature, and which, in its strong form, simply says that the probability of a firm growing at a given proportionate rate during any specified period of time is independent of the initial size of the firm. Thus, if the size of the ith firm at time "*t*" is denoted by S_{it}, the Law of Proportionate Effect asserts that

$$S_{it}/S_{i,t-1}=\varepsilon_{it}, \qquad \ldots(1)$$

where ε_{it} is a random variable distributed independently of $S_{i,t-1}$.

Apart from yielding many precisely testable hypotheses which will be described later, the LPE has some important economic implications. First, like the managerialist approach discussed above, the Law implies that there is no optimum size of the firm, although, unlike that approach, it does not imply that size and growth should be positively related. Secondly, in its strongest form, it suggests that the rate of growth of the firm in one period has no influence on its growth in the subsequent periods.[1] Thirdly, in its strong form, stated in equation (1), the Law implies increasing industrial concentration in a *constant* population of firms over time. This is intuitively obvious, and is easily demonstrated by the application of the Central Limit Theorem to log ε_{it}. If the assumptions of the Central Limit Theorem are met the variance of log S_{it} will increase proportionately through time, and as $t\rightarrow\infty$ it will become infinite (cf. [8]). However, if the LPE does not operate in the strong form stated above [9], or if it is assumed that there is a particular way in which firms enter or leave the population [15], there need not be increasing industrial concentration over time.

Furthermore, the stochastic processes derived from the LPE are broadly able to explain the observed size distributions of firms, which from widely different populations have been known to approximate the Pareto or log-normal distributions. The usual economic theories of the firm outlined above yield no predictions about the precise form of the size distribution of firms, but the LPE, with suitable modifications, does generate distributions of the type which are observed. For instance, it can be shown that if firm growth is governed by the LPE, as given in equation (1), the size distribution of firms would tend towards a log-normal distribution [18].

In view of its important implications, the empirical sections which follow will examine directly the validity of the LPE. It asserts two immediately testable hypotheses concerning the cross-section relationship between the size and growth of firms: *(a)* that

[1] This assumption enables the LPE to be treated as a first-order Markov process. However, a less stringent version of this Law, which does not require serial independence of growth rates, can also be incorporated in a stochastic model [8]. See further Section 7 below.

firms of different size-classes have the same average proportionate growth rate; and *(b)* that the dispersion of growth rates about the common mean is the same for all size-classes. Both *(a)* and *(b)* are necessary conditions for the validity of the Law in its most stringent form, but they are not sufficient since the Law suggests that the entire distribution of growth rates should be the same for the firms of different sizes. There is another implication of the strongest form of the Law which can also be directly tested, namely: *(c)* that the rate of growth of the firm in one period should be independent of its growth rate in subsequent periods, i.e. there should be no serial correlation in firm growth rates. If this were not so, it might be expected, *ceteris paribus,* that opening size and subsequent growth would be related because both are related to past growth.[1] Hypothesis *(c)* is of considerable economic interest and deserves to be examined in its own right.

3. EMPIRICAL RESULTS: HYPOTHESES *(a)* AND *(b)*

In this section, we shall test hypotheses *(a)* and *(b)* by comparing the means and standard deviations of growth rates of firms in different size-classes. The tests are based on data pertaining to all UK companies in Manufacturing, Construction, Distribution and Miscellaneous Services which had a quotation on the stock market and which survived over the period 1948–60 or over either of the two shorter periods 1948–54 and 1954–60. The same data, but confined to only four manufacturing industries (Food, Non-electrical Engineering, Clothing and Footwear, and Tobacco), were used in [17], to which the reader is referred for a precise definition of the population of companies studied, for a full account of the nature and limitations of the date, and for a discussion of different measures of "size" and "growth". We simply note that size is measured here by the balancesheet value of the firm's net assets; "growth" of net assets is not corrected for changes in the price level. Another measure of growth (of physical assets) is also used; it measures the increase in the fixed tangible assets of the firm, and is also based on balance-sheet values, with no correction for inflation. In the context of the discussion of the LPE, it must be emphasized this study is confined to quoted companies.

3.1. *Average Growth Rate by Opening Size-Class*

Table I gives the means and standard deviations of growth rates (per annum) of the surviving firms in different size-classes over the period 1948–60, and over each of the two sub-periods 1948–54 and 1954–60 respectively, for all 21 industries together. Tables for individual industries are not given here to save space.[2] Firms are arranged by "opening size", i.e. size at the beginning of each of the relevant periods, and a geometric scale has been used for division into size-classes.

[1] The caveat is important: the effect of positive serial correlation could be offset by other economic factors which tended to cause a negative relationship between opening size and growth.
[2] Copies of all unpublished tables are available from the authors.

TABLE I

Growth of net assets by opening size-class: all 21 industries together: 1948–60, 1948–54, and 1954–60

Opening size-class (£000's)	Period								
	1948–60			1948–54			1954–60		
	n	*m*	*s*	*n*	*m*	*s*	*n*	*m*	*s*
1<250	483	6.1	6.6	676	5.7	7.2	409	6.4	120
2<500	464	6.5	5.2	587	6.9	6.6	454	5.8	8.1
3<1000	389	7.0	5.3	492	7.2	7.0	506	6.2	7.3
4<2000	271	7.2	5.4	330	7.5	6.2	433	6–6	7.1
5<4000	167	7.9	5.4	203	7.5	6.6	247	7.2	6.3
6>4000	181	8.4	4.9	201	8.5	5.9	315	8.5	6.1
All companies	1955	6.9	5.7	2489	6.9	6.8	2364	6.6	8.2
Welch- Aspin test[1]	1<3, 1<4, 1<5, 1<6, 2<4, 2<5, 2<6, 3<5, 3<6, 4<6			1<2, 1<3, 1<4, 1<5, 1<6, 2<6, 3<6, 4<6			1<6, 2<5, 2<6, 3<5, 3<6, 4 <6, 5<6		

Note to Table I
n=Number of observations.
m=Mean annual growth rate in percentage points.
s=Standard deviation, unconnected for degree of freedom.

The table shows an almost systematic positive relationship between size and average growth rate in all three periods. The Welch-Aspin test [1], which does not assume equal variances in the two populations, was used to test the significance of the observed differences between the mean growth rates in the various size-classes; the results of the test are reported in the last row of Table I. Thus we find that, for the period 1948–60, of the 15 possible pairs of size-class means for which significant differences could have been found, the differences in the mean growth rates were significant at the 10 per cent level in 10 cases; for 1948–54 they were significant in 8 cases and for 1954–60 they were significant in 7 cases. These results suggest on the whole a significant, though not a strong, positive association between firm size and average growth rate.

The above conclusion must be treated with caution since it could have arisen solely from aggregating industries with very different distributions of sizes and growth rates of firms. It is, therefore, necessary to examine the relationship between the two variables in the individual industries. The tables for the individual industries showed that because of the relatively small number of observations in each size-class, the differences between the mean growth rates were significant in comparatively few cases (120 out of 675 possible cases). Nevertheless, in a large majority of industries, firms in the larger size-

[1] The Welch-Aspin test section reports those differences between pairs of size-class means which are statistically significant at the 10 per cent level, using a two-tailed test.

classes showed, on the whole, higher average growth than firms in the smaller size-classes. The weight of the entire evidence, both for the individual industries and for the aggregate of industries, points to the conclusion that there is a weak positive relationship between size and growth. At the very least, given the evidence, the hypothesis of positive association cannot be rejected.

This conclusion was confirmed by the results of the regression analysis (not reported here) in which we fitted the following simple model to the cross-section of firms in each industry, for each period.

$$\text{Growth} = a + b \cdot \log \text{ Opening Size} + e. \qquad \ldots(2)$$

We must therefore conclude that hypothesis *(a)* of the LPE is not supported by the data. The evidence of the regression analysis as well as of the distribution of growth rates by size-class clearly suggests a mildly positive relationship between the variables.

3.2 *The Standard Deviation of Growth by Size Class*

Table I shows that the standard deviation of growth rates declines with an increase in firm size in all three periods. An approximate statistical test[1] was used to examine the hypothesis of homogeneity in the dispersion of growth rates of firms in different size-classes. The hypothesis was decisively rejected at the 1 per cent level in each time-period.

In order to check the possibility of aggregation bias, the relationship between the two variables was examined in the individual industries. In *most* industries, the standard deviation of growth rates in the largest size-classes was less than that observed in the smallest size-classes. The homogeneity hypothesis was rejected at the 5 per cent level in 17 out of 20 industries[2] for the period 1954–60, in 12 industries for the period 1948–54 and in 10 industries for the period 1948–60. The balance of the whole evidence clearly indicates that the second prediction of the LPE, that the dispersion of growth rates in different size-classes is the same, should also be rejected. The evidence against the second prediction is considerably stronger than that against the first.

It is not at all surprising that this hypothesis is rejected. Indeed, from an economic point of view, one would expect that large firms would tend to have more uniform growth rates than small firms. This is because large firms are likely to be more diversified and this would allow them to offset an adverse growth rate in one market against a good performance in another. If a large company was merely a group of smaller subsidiary companies operating independently in different markets, so that the growth rates of

[1] The test used was that given in Table 31 of *Biometrika Tables for Statisticians*, Vol. 1, supplemented in marginal cases by the M-test (*Biometrika Tables*, Table 32).

[2] Only 20 of the 21 industrial groups could be tested because the small number of companies in Tobacco (Industry 14) made it unsuitable for testing.

subsidiary companies were independent of each other, then an elementary statistical theorem shows that the standard deviation of the holding company's growth rates would be inversely proportional to the square root of its size. In fact, in none of the individual industry groups nor in "all industries" together (see Table I) does the standard deviation decline with an increase in the size of the firm as rapidly as is required by this theorem. This merely confirms the common-sense view that a large firm cannot be viewed as an aggregation of independent smaller firms: the performance of different parts or divisions of the firm are not totally unrelated to each other (cf. [14]).

4. THE REGRESSION OF LOGARITHMS OF CLOSING SIZE ON LOGARITHMS OF OPENING SIZE

Another way of testing whether or not the requirements of the LPE are met is to study the relationship between the logarithms of firm sizes at the beginning and at the end of a period. If the LPE is valid, then following from equation (1) there will be a systematic relationship between the two variables, which would be reflected by the parameters of the equation:

$$\log S_{it}=a_t+b.\log S_{i,t-1}+\log \varepsilon_{it}, \qquad \ldots(3)$$

where $\log \varepsilon_{it}$ is a homoscedastic random variable with zero mean. When $b=1$ and the variance of $\log \varepsilon_{it}$ is in fact constant, this will mean that for all firms, irrespective of size, the average and variance of the logarithms of proportionate growth are the same, i.e. the two basic requirements of the LPE are met. If, however, $b>1$, it is easy to show that the large firms will grow proportionately faster and the dispersion in the size of firms will increase. If "b" is less than 1, the smaller firms will tend to grow proportionately faster, which will tend to reduce the degree of dispersion, although ε_{it} may be powerful enough to outweigh this effect.

The results obtained by fitting equation (3) by least squares to the cross-section of firms in each industry for the whole period 1948–60 are given in Table II. The corresponding tables for the two sub-periods are omitted to save space. The most striking feature of the regression results is that *"b"* exceeds 1 in almost every industry over each of the three time-periods considered. It is true that *"b"* significantly (5 per cent level) exceeds 1 in only a few individual industries, but in view of the fact that it is almost always greater than unity and significantly exceeds one for all industries together, this confirms the conclusion that the data reject the first essential requirement of the LPE. The evidence in favour of rejecting this requirement is stronger on the basis of equation (3) than on the basis of regression equation (2), used earlier.

TABLE II

Regression results: whole period, 1948–60

Equation: log Closing Size=a+b.log Opening Size+ε

Industry		a	b	SE (b)	R^2
Bricks, Pottery, etc.	(01)	0.14	1.11†	0.05	0.85
Chemicals and Allied Industries	(02)	−0.10	1.15†	0.06	0.81
Metal Manufacture	(03)	0.95*	1.02	0.04	0.89
Non-electrical Engineering	(04)	0.99*	1.02	0.03	0.82
Electrical Engineering	(05)	1.17*	1.01	0.05	0.85
Vehicles	(06)	−0.00	1.14	0.09	0.74
Metal Goods n.e.s.	(07)	0.77*	1.03	0.06	0.73
Cotton and Man-made Fibres	(08)	0.56	1.02	0.05	0.89
Woollen and Worsted	(09)	0.18	1.09	0.07	0.81
Hosiery, etc.	(10)	0.67*	1.01	0.05	0.82
Clothing and Footwear	(11)	−0.28	1.14	0.08	0.72
Food	(12)	0.67*	1.03	0.05	0.86
Drink	(13)	−0.09	1.09†	0.04	0.88
Tobacco	(14)	2.42	0.83	0.33	0.38
Paper, Printing, etc.	(15)	0.62*	1.04	0.04	0.85
Leather, etc.	(16)	0.17	1.08	0.06	0.70
Construction	(17)	0.53	(2.3)	0.10	0.72
Wholesale Distribution	(18)	0.75*	0.98	0.05	0.71
Retail Distribution	(19)	0.71*	1.04	0.05	0.79
Entertainment and Sport	(20)	−0.27	1.08	0.04	0.92
Miscellaneous Services, etc.	(21)	0.52*	1.01	0.03	0.87
All industries		0.41	1.06†	0.01	0.82

Notes: * *"a"* coefficient significantly different from zero at the 5 per cent level.
† "b" coefficient significantly different from one at the 5 per cent level, (t-tests).
Natural logarithms and the pre-1958 2-digit Standard Industrial Classification were used.

There are, however, two qualifications to this conclusion which should be considered. Firstly, the values of *"b"* may be subject to an upward bias if the assets of large firms are more likely to have been revalued than those of small firms. There is some evidence [17, pp. 90–92] that this was in fact the case during the period studied. However, the conclusions of Section 3 are not affected by this qualification, since the measure of proportionate growth used there excludes the effects of revaluation. Secondly, in view of the results of Section 3, it is most likely that the error term in equation (3) is heteroscedastic. This would affect the efficiency of the estimates reported in Table II, but the estimates would still be unbiased. (See, however, Section 5 below.)

Since b typically exceeds 1, it must imply increased industrial concentration amongst continuing companies (as measured by the variance of log S_t) in 1960 compared with either 1948 or 1954. The restriction to continuing companies is important since concentration amongst all firms over a period of time is not merely a function of the growth process of the existing firms, but also of the nature and the rate of new entry and

exit from the company population. The problem of "births" and "deaths" will be dealt with in Section 6, but it is sufficient to note here that the variance of log size did increase in almost every industry and for all industries together over the periods observed.[1]

One interesting insight into the concentration process is that the *"b"* coefficient seems to be highest in those industries in which the average rate of growth of firms was lowest, i.e. within the relatively stagnant industries the large firms tended to grow faster. The Spearman rank correlation coefficients, r_s, between the mean industry growth rates and the *"b"* coefficients, ranked across 21 industries are as follows:

1948–54 −0.553*; 1954–60 −0.574*; 1948–60 −0.198

* indicates significantly different from 0 at the 10 per cent level.

The above result, which implies a negative association between *changes* in industrial concentration and industry growth rates, is not surprising from an economic point of view. Although the question has not before been considered in empirical studies of the LPE, there is some evidence both from UK [4] and US [19] which supports this conclusion.

5. THE PERSISTENCE OF GROWTH

In this section we shall investigate whether firms which had high (or low) growth rates over one six-year period (1948–54) also tended to have high (or low) growth rates in the subsequent six-year period (1954–60). It will be recalled that the LPE in the strongest form discussed in Section 1 (a first-order Markov process) implied no serial correlation between firm growth rates. On the other hand, many of the recent economic models of firm growth [11] are "steady state" models in which firms are assumed to choose long-run stable growth paths depending on their respective utility functions and their resource and other constraints. These models suggest a high degree of persistence in the growth rates of firms. It is important to find out which of these two views is more in accord with the empirical evidence.

This problem was investigated by means of regression analysis. Denoting the proportionate growth per annum of the ith firm over the period 1954–60 by g_{it}, over the period 1948–54 by $g_{i,t-1,}$ the following regression equation was fitted by least squares to the cross-section of firms in each industry separately and in all industries together:

$$g_{it}=a+b\cdot g_{i,t-1}+e_{it} \qquad \ldots(4)$$

[1] It must be emphasized that there is no particular virtue in the variance of log size as a measure of concentration, and we recognize all its defects from an economic point of view [2]. We are using it here merely as one possible indicator of the degree of industrial concentration.

The results, which are not given here, indicate that there is a definite tendency for the relative growth rates of individual firms to persist: the *"b"* coefficient is positive in almost all the individual industries and in "all industries" together; it is also significantly (5 per cent level) different from zero in many individual industries and for all industries together. On the other hand, since the values of R^2 are uniformly low (about 0.05), the past growth record of the firm cannot be regarded as a good predictor of its future growth. Furthermore, although the *"b"* coefficient is greater than zero, it is always considerably below 1 (on average about 0.3), which implies a tendency for firm growth rates to regress over time towards the mean growth rate of the industry.[2]

To overcome the problem of extreme values as well as of possible non-linearity, rank correlation analysis was used to supplement the results of the regression analysis. The rank correlation coefficients were positive in *every* industry, and although they were relatively small, they were statistically significant at the 5 per cent level in 17 out of 21 industries. These results thus provide even stronger evidence that there is a definite but relatively small degree of persistence in the growth rates of firms, where growth is measured in terms of net assets.[1] It is, however, important to remember that the persistence of growth has been studied here only over a subsequent six-year period. One would expect to observe a stronger persistence in the growth rates of firms over shorter time-periods and less persistence if time-spans of much longer than 6 years were examined.

In view of the observed persistence in growth and the mildly positive relationship between size and growth, it is possible that the estimates of the regression coefficients in equations (3) and (4) above, particularly the *"b"* coefficient in (3), may have an upward bias due to omitted variables, i.e. it is possible that the weak positive association between growth and opening size was due to the fact that both growth and opening size are positively associated with past growth, rather than to a direct structural relationship. To check for this bias, the following regression equation which approximately encompasses both (3) and (4) was also estimated.[2]

$$\log (S_{it}/S_{i,t-1}) = a + b \cdot \log S_{i,t-1} - c \cdot \log (S_{i,t-1}/S_{i,t-2}) + v_{it}, \qquad \ldots(5)$$

[2] It should also be noted that any measurement errors in the observation of size in 1954 will cause *b* to be biased downwards.

[1] When growth is measured in terms of "physical" assets rather than net assets, the observed persistence in growth rates was lower.

[2] We are grateful to a referee for suggesting this equation. One could obviously attempt more complicated autoregressive schemes, but since we are only testing the LPE in its strongest form which precludes any serial correlation in growth rates, and in view of the data available to us, we have confined ourselves to a second-order autoregressive equation above.

where *t*, *t*−1 and *t*−2 refer to 1960, 1954 and 1948 respectively. The regression results showed that the positive association between size and growth was very much weaker when the influence of past growth was removed, i.e. the coefficient "*b*" was much lower in equation (5) than in equation (3). For example, when the equation was estimated across the pooled population for all industries, "*b*" was 0–04 in equation (3) and 0–01 in equation (5), and only the former was significantly different from zero at the 5 per cent level. The positive serial correlation of growth rates was, on the other hand, reduced only slightly by allowing for the influence of opening size.

We conclude that a large proportion of the positive relationship between size and growth is due to the positive serial correlation of growth rates. This does not affect our conclusion that the Law of Proportionate Effect is contradicted by the observed relationship between growth and opening size, but it does draw attention to the probability that serial correlation of growth rates is the main cause of this result.

6. BIRTHS AND DEATHS

The empirical analysis of the previous sections has been confined to surviving companies. In this section we present the results of a limited analysis of companies which "died" (i.e. disappeared from the population) or which were "born" (i.e. added to the population) during some of the periods considered, in order to give a rough indication of the size and impact of the birth and death process.

The analysis of births and deaths is based on a restrictive range of companies; companies which were born in 1948–54 and subsequently continued throughout the period 1954–60, and companies which died in 1954–60 and had previously continued throughout 1948–54. In spite of its limited scope, this analysis revealed three important features of the birth and death processes during the periods examined. Firstly, it was found that although most of the births occur in the smaller size-classes, a considerable number occur in all size-classes. This pattern of births is contrary to that assumed in some recent stochastic models of firm growth [15, 7], which hypothesize that the birth of companies occurs only in the smallest size-class. The wide range of size of births is partly due to the fact that *quoted* companies are often in existence as unquoted companies for a number of years before achieving a quotation and so being born into our population. It is also due to the fact that new quoted companies are often formed as a result of mergers: in such a case, the new company will be as large as the sum of its component companies.

Secondly, it was found that most of the deaths also occur in the smaller size-classes and that the incidence of deaths declines systematically with an increase in firm size. In fact, when the largest size-class (firms with net assets of greater than £4 million) is further subdivided, it is found that the incidence of deaths declines much more sharply with an increase in the size of the firms. Thus, there is a negative, non-linear relationship between firm size and the probability of death (cf. [17, p. 89] and [16, ch. 2]). It is important to note in this context that if the LPE is thought to apply to *all* firms and not just the *surviving* firms, the incidence of death (or very high negative growth rate) should be independent of firm size. This is clearly not the case.

Thirdly, we studied the net impact of births and deaths on the company population. When the "net change" due to births and deaths in the number of companies in each size-class was considered, it showed that there was a proportional loss of companies which was spread more or less evenly over all size-classes except the smallest, in which there was a much higher net loss of companies. The next highest net loss occurred in the largest size-class, due to the low birth rate in that size-class. This suggests that the concentration index, as measured by the variance of log size, might have decreased because the extreme sizes tended to disappear most. An examination of changes in the dispersion of logarithms of firm sizes for the various populations showed that the impact of births and deaths caused the dispersion to decrease in 12 out of the 21 individual industries and when all industries are considered together. On the other hand, we find that for the continuing populations of firms the concentration index increased in 20 of our 21 industrial groups, which is not surprising in view of our results in Sections 3 and 4. It should, however, be noted that it is rather artificial to separate the impact of births and deaths from the effects of the growth process in this manner. As will be discussed in Section 7, take-overs are the major cause of "death" and are also a major means by which the surviving companies grow.

7. SUMMARY, CONCLUSIONS AND ECONOMIC IMPLICATIONS

We summarize below the main stylized facts about the growth process of firms which have emerged from our analysis of the records of nearly 2000 UK quoted companies over the period 1948–60. These facts are as follows:

(1) Among the surviving firms, there is a mildly positive relationship between size and growth. The larger size-classes tend to have a somewhat higher mean growth rate than firms in the smaller size-classes. This finding revises a major conclusion of our previous study [17] and that of many of the other studies in this area; that mean growth rates are much the same for firms of various sizes. [17] was, however, based on an analysis of quoted companies in only three large industry groups; it is the extension of the analysis to all 21 industries which has enabled us to establish that there does exist a definite, albeit weak, positive relationship between size and growth.

(2) The dispersion of growth rates declines with an increase in firm size. The large firms do not, however, experience as high a degree of uniformity in their growth rates as would be compatible with the view that the typical large firm is merely an aggregation of typical independent small firms. This conclusion confirms the findings of [17].

(3) Firms which have an above (or below) average growth rate over one 6-year period also tend to have an above (or below) average growth rate in the subsequent 6-year period. The evidence from this study indicates a definite, but relatively small, degree of persistence in firm growth rates over the period examined. This finding confirms and reinforces a tentative conclusion of [17]. It should be emphasized that the persistence of growth rates has been examined here only over a 6-year period. The degree of persistence of growth is likely to be greater over shorter time-periods and it may disappear altogether if a time span of much longer than 6 years is considered.

(4) The persistence of growth rates through time ((3) above) is a major cause of the positive association between size and growth ((1) above).

(5) A limited analysis of "births "and "deaths" has shown: *(a)* that, although the incidence of births declines with an increase in firm size, a considerable number of births occur in all size classes; *(b)* that the incidence of deaths also declines with an increase in firm size, and amongst the largest firms alone, it declines more sharply as the size of the firm increases—thus, there is a non-linear negative relationship between size and the probability of death; *(c)* that the net impact of the birth and death process was, in a majority of the industries studied, to reduce the index of concentration, as measured by the dispersion of the logarithms of firm sizes.

There are two essential points to note about the findings (1) to (5) above. First, it is important that none of these findings is unacceptable from the economic point of view; the discussion in Sections 2 to 6 has shown that all of them have a good economic explanation. The observed weak positive relationship between size and growth is compatible with the emphasis of contemporary theories on the *growth* of the firm, although they are not consistent with the traditional static concept of the optimal *size* of the firm. On the other hand, the fact that the degree of persistence in growth rates is small, argues against the analysis of the firm growth process in terms of the steady-state long-run growth models of the kind used in these theories (cf. [21]).

Secondly, we have seen that all these findings, particularly (1) to (3) above, are incompatible with the LPE in its strong form discussed in Section 2. There are, however, many stochastic models of firm growth which incorporate some weaker versions of this law and which generate skew distributions broadly similar to that of the size of firms. The question arises as to whether the stylized facts discovered in this study are compatible with any of these other models.

The most promising models in this context are those of Ijiri and Simon [7] and [8], which explicitly incorporate serial correlation in firm growth rates. These models are *broadly* compatible, particularly with respect to the surviving firms, with the first three stylized facts outlined above (i.e. those pertaining to the means and the standard deviations of growth rates and to the observed persistency in growth). It might be argued that the Law of Proportionate Effect is an "extreme hypothesis", in the sense used by L.J.Savage, and one might therefore ignore the mildly positive relationship between size and growth [7]. The major weakness of these models lies, however, in their treatment of births and deaths, particularly the latter. [8] does not deal with the problem at all whereas [7], although it specifically considers new entry in the lowest size class, ignores "mergers or decreases in sizes of individual firms".

However, mergers and take-overs are not only quantitatively very important, they make the births and deaths of firms a far more complicated process than that incorporated in other stochastic economic models such as those of income or wealth: in particular, the death of a firm by take-over implies a substantial increment to the growth of the acquiring firm. The importance of amalgamations is indicated by the fact that they are overwhelmingly the largest single cause of death of firms quoted on the stock market and exert an increasingly important influence both on the growth of firms and their size distribution. During the years 1954–60, mergers and take-overs accounted for nearly 80 per cent of deaths of companies quoted on the UK stock markets [16]. Furthermore, mergers are an important cause of the birth of very large quoted companies. The incidence of deaths for the UK quoted firms since the middle 50's has been more than 3 per cent a year [3,16], an historically unprecedently high rate.

Mergers and take-overs are also known to possess certain other characteristics, e.g. both in the UK and the USA, merger activity has taken place in irregular, long-term (a decade or longer) waves [10]. There is certainly no reason to believe that the probabilities of firm disappearance through take-over remain constant through time. It seems obvious, therefore, that before one can consider "steady state" distributions of firms in any economically meaningful sense, stochastic models of firm growth and size must pay adequate attention to the salient features of merger and take-over activity. These features are discussed more fully in [16].

Finally, it is interesting to compare the "stylised facts" about the growth process of firms with those concerning the relationship between the size and profitability of firms. An investigation [20] of the relationship between long-run (6-year or 12-year average) profitability and size for the data examined in this study, revealed, among other things: (i) that average profitability declines slightly with size, (ii) that the standard deviation of profitability also declines, but relatively more sharply, with an increase in firm size. Furthermore, it was found (iii) that the persistence in the average profitability of firms was much higher than that observed for their growth rates.

A comparison of these facts with those outlined earlier for the relationship between size and growth has implications for the relationship between the growth and profitability of firms. These were discussed in [17] and will be examined further in a subsequent paper.

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THE PROFITABILITY AND SIZE OF UNITED KINGDOM COMPANIES, 1960–74

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I. INTRODUCTION

THIS empirical study extends the author's earlier investigation of the relationship between the profitability and size of United Kingdom-based quoted manufacturing companies for the period 1948–60 (Whittington [20]). The following extensions are made:

1. The time period studied is 1960–74.
2. Greater attention is paid to the inter-temporal variability of profitability, which was previously studied only for a restricted range of industries and for one measure variability.
3. A greater variety of profitability and size measures is used. This is due to the fact that, since the 1967 Companies Act, companies have had a statutory obligation to publish aggregate sales and wages, the latter enabling us to estimate value added.

This study is not, however, as detailed as the earlier study in certain respects. In particular, only a limited number of relationships have been investigated at the industry level, and there are no tabulations of the average and standard deviation of profitability classified by various size classes.

II. THE SIGNIFICANCE OF THE RELATIONSHIP BETWEEN PROFITABILITY AND SIZE

The economist may be interested in the relationship between profitability and size for two broad reasons, (1) its likely effect on industrial concentration, and (2) its possible implications for returns to scale and monopoly power.

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1. Profitability is positively related to growth,[1] and it seems likely that high profitability will lead to a high rate of growth,[2] since higher profits provide both the means (greater availability of finance from retained profits or from the capital market) and the incentive (a high rate of return) for new investment. Thus the relationship between profitability and size is potentially important as indicating an important factor which is likely to contribute to changes in the degree of concentration: a positive relationship between average profitability and size would suggest that industrial concentration is likely to be increased by large firms growing at a faster average rate than small firms. This would reinforce the well-documented tendency[3] for concentration to increase as a result of the inter-firm dispersion of growth. In addition to average profitability, the variability of profitability through time is useful as a measure of risk. On the usual assumption of risk-aversion, we might expect that lower variability would imply that the average rate of return had desirable risk characteristics,[4] so that even if the rate of profit did not, on average, vary with firm size, we would expect declining variability of profitability with respect to firm size (as might be expected, in the light of earlier empirical studies, and the *a priori* arguments about the greater risk-spreading potential of large firms) to provide an incentive for relatively high growth of large firms.
2. The implications of the relationship between profitability and size for economies of scale and monopoly power are, unfortunately, ambiguous, because the two effects are not identified separately. Economics of scale will affect the cost structure of firms of different size, whereas monopoly power will affect revenue (through decisions as to price and quantity of output). Monopoly power may also enable a monopolistic firm to operate inefficiently, so that it is not forced towards its production possibility frontier and does not take full advantage of economies of scale. Thus, we can make no clear inferences about either economies of scale or monopoly power from the subsequent empirical study of the relationship between profitability (measured as an accounting rate of return) and size. Furthermore, it should be noted that monopoly power is related to a particular market and economies of scale to a particular product (or groups of jointly produced products), so that only studies across individual industries could possibly be relevant to these issues.

[1] See Singh and Whittington [18] for empirical evidence. This study has since been extended to cover more industries, with similar results. See Whittington [20, Table 5.3].
[2] Professor G.R.Fisher, in his review [3] of Singh and Whittington claimed that the regression of growth and profitability might not identify a causal relationship from profitability to growth, but rather a relationship in the reverse direction. However, it seems likely that, in a cross-section study, the growth to profitability relationship would vary considerably across firms, whereas the profitability to growth relationship would be common to all (being largely determined by the capital market), so that we would expect to identify the profitability to growth relationship. See Singh and Whittington [18, pp. 148–50].
[3] See Hart and Prais [5], Singh and Whittington [18] and Prais [15].
[4] But this is not necessarily so if we accept the capital asset pricing model, developed by Sharpe [17] and Lintner [9] from the portfolio theory of Markowitz [10], which regards the correlation of a single security's return with those on the other securities in the market as being the key to the evaluation of risk in a diversified portfolio.

A final note of caution is required concerning the use of accounting data. At best, the accounting rate of return is only an approximation to the rate of return used by economists is theoretical work (which is usually based on discounting): at worst the accounting rate of return can be seriously biased. The present author has discussed these issues in detail elsewhere (Whittington [21]), and an elegant theoretical exposition of the relationship between the accountant's rate of return and the internal rate of return will be found in Kay [8]. Here it must suffice to say that the accounting rate of return is likely to be a less misleading indicator of the true *ex post* economic return, the longer the period over which it is measured, the larger the number of observations studied, the less divergent the rates of growth of the companies studied, and the more homogeneous the type of assets held by the firms studied. With respect to the subsequent studies, this means that we would tend to have most confidence in the rates of return for Population 1 (which covers 14 years) and least in those for Population 3 (which covers only one year). We should also expect there to be less bias in the accounting rate of return comparisons which are made across individual industries rather than those made across all industries, although the latter have the advantage of using a larger number of observations, which will lead to a more effective averaging out of unsystematic error.

III. THE DATA

The data used in this study are company accounting data derived from the Company Accounts Data Bank, which was prepared at the Department of Applied Economics, Cambridge, and the University of Edinburgh by the present author and others, using the original work of abstracting company accounts which was carried out by the National Institute of Economic and Social Research and the Statistics Division of the Board of Trade (now the Department of Industry). The basic data are discussed in more detail in Singh and Whittington [18] and Meeks and Whittington [11]. The companies included in the study all have stocks or shares listed on a United Kingdom stock exchange and were engaged in manufacturing industry or a limited range of services, primarily within the United Kingdom. Three populations were studied, Population I consisted of the 735 companies which survived with full records in the data bank from 1960 to 1974, Population 2 was the 887 companies which survived from 1967 to 1974, and Population 3 was the 1080 companies which existed in 1973 to 1974.[5] Table I gives demographic details of each population, classified by industry.

[5] A small number of companies (two in Population 1, nine in Population 2, and two in Population 3) was excluded on the grounds of peculiar characteristics which made them unsuitable for analysis, an example of such characteristics being negative net assets, which made the conventional accounting rate of return meaningless.

The variables calculated for each company were as follows:

Size Measures

1. Net assets, i.e. total assets, *less* current liabilities, as measured in the balance sheet at the beginning of the year.
2. Gross assets, i.e. net assets, *plus* accumulated depreciation provisions.
3. Sales.
4. Value added, i.e. total profits (before taxation, long-term interest, dividends or depreciation) plus wages and salaries.

TABLE I

DEMOGRAPHIC STATISTICS OF THE POPULATIONS STUDIED, CLASSIFIED BY INDUSTRY

Industry		*Number of companies*		
2-digit SIC	*Name*	*Population 1 1960–74*	*Population 2 1967–74*	*Population 3 1973–74*
5	Miscellaneous manufacturing	5	5	6
10	Conglomerates	6	12	16
21	Food	24	30	31
23	Drink	35	41	44
24	Tobacco	3	3	3
26	Chemicals and allied industries	34	39	49
31	Metal manufacture	30	31	39
33	Non-electrical engineering	1 06	117	140
36	Electrical engineering	36	44	52
37	Shipbuilding and marine	4	5	5
38	Vehicles	23	28	35
39	Metal goods NES	51	58	65
41	Textiles	53	60	68
43	Leather, leather goods and fur	3	5	6
44	Clothing and footwear	21	25	33
46	Bricks, pottery, glass, cement, etc.	27	32	39
47	Timber, furniture, etc.	17	23	26
48	Paper, printing and publishing	49	57	66
49	Other manufacturing industries	27	32	37
50	Construction	33	46	78
70	Transport and communication	1 1	13	14

81 Wholesale distribution	47	63	75
82 Retail distribution	59	74	86
88 Miscellaneous services	31	44	67
Total	735	887	1080

Profitability and Performance Measures

1. Rate of return on net assets, i.e. profit after deducting depreciation but before deducting taxation and interest, divided by net assets.
2. Rate of return on gross assets, i.e. total profit, before deducting depreciation, taxation and interest, divided by gross assets.
3. Profitability margin, i.e. operating profit divided by sales.
4. Sales/asset ratio, i.e. sales divided by net assets. The latter is not strictly a profitability measure but a performance measure which may help to explain profitability patterns, particularly when used in conjunction with the profitability margin.

Companies were not required to publish sales or wages figures before the 1967 Companies Act, so that size measures 3 and 4 and profitability and performance measures 3 and 4 are not available for Population 1 (which covers the period 1960–74).

Each of the above measures was calculated on an annual basis and the arithmetic average of the annual values was then calculated over the relevant period.

Table II gives some descriptive measures of each of the above variables calculated across each of Populations 1 and 2. It will be observed that the size measures are all positively skewed: this is indicated by the skewness measure and by the fact that the standard deviation exceeds the mean (none of the size measures can be negative), and confirms the well-known observation that the size distribution of firms is broadly consistent with the lognormal or Pareto patterns (Hart and Prais [5] and Ijiri and Simon [6]). Absolute profit measures (not reported in Table II) also exhibited strong positive skewness, but when these were deflated by size measures to produce profitability ratios, most of the skewness disappeared, although slight positive skewness remains. The main exception to this is the sales/asset ratio which exhibits fairly strong positive skewness. As might be expected, the skewness of all the size measures and the sales/asset ratio is reduced considerably when individual industries are studied, indicating that a major factor is the effect of aggregation across industries.

TABLE II

DESCRIPTIVE STATISTICS OF THE MAIN VARIABLES

	Mean		*Standard Deviation*		*Skewness*	
Variable	*Population 1*	*Population 2*	*Population 1*	*Population 2*	*Population 1*	*Population 2*
Net assets	20,825	24,631	67,561	82,211	11.5	11.4
Gross assets	27,962	33,436	93,862	116,940	12.3	12.9
Sales	NA	52,286	NA	133,814	NA	6.8
Value added	NA	13,246	NA	36,108	NA	9.3
Rate of return on net assets	17.2	18.0	7.4	9.3	0.51	0.40

Rate of return on gross assets	17.0	17.8	6.3	7.8	0.71	0.75
Profitability margin	NA	10.1	NA	5.7	NA	1.35
Sales/asset ratio	NA	2.84	NA	2.38	NA	4.38

Notes

1. Units of measurement: size measures (rows 1–4) are all in £'ooos. Rates of return and profitability margin are in percentage points. Sales/asset ratio is expressed as a ratio. Size measures are averaged over the relevant periods.
2. The skewness measure is based on the third moment about the mean, the precise measure being $\sum_{i=1}^{n} \frac{[(X_i - \bar{X})/S]^3}{n}$ where n is the number of observations, *S* is the standard deviation and $\bar{X}$ is the mean. A negative value of this measure indicates skewness, a zero value perfect symmetry, and a positive value positive skewness, in the case of a continuous single-peaked distribution of the 'bell-shaped' type, but the measure can be unreliable if the distribution is not of this type.
3. NA indicates not available.

IV. SIZE AND AVERAGE PROFITABILITY

The relationship between average profitability and size is of central interest. The measures of profitability available are rate of return on net assets and rate of return on gross assets. The profit margin and the sales/asset ratio are measures which give an insight into the composition of profitability rather than being complete measures of profitability. The rate of return on net assets was selected as being the most satisfactory of the two profitability measures (see Kay [8]), and results using this measure only will be reported here, although the results did not change substantially when the rate of return on gross assets was substituted.[6]

The specification of the relationship between profitability and size which was used for the most comprehensive analysis (including studies across individual industries) was the semi-logarithmic form:

$$P_{i,t} = a + b \cdot \log S_{i,t} + \epsilon_{i,t}$$

where P is a measure of the rate of return
S is a size measure
ϵ is the stochastic error term, with zero mean
a, b are parameters
i refers to the ith form and t to the time period

[6] This was done for all of the 'all industries' analysis, but not for individual industries.

This assumes that *absolute* variations in the rate of return are linearly related to the *proportionate* variations in size. This is intuitively plausible and is also consistent with the observation made earlier that the distribution of size exhibits high positive skewness whereas the distribution of profitability is approximately symmetrical. If there were a linear relationship between absolute variations in profitability and absolute variations in size we should expect that very large companies would typically exhibit drastically higher (in the case of a positive coefficient) or lower profitability than the rest of the company population, which is manifestly not the case (Meeks and Whittington [11]), and, moreover, the distribution of profitability would be highly skewed, which is also not the case.

Although the semi-logarithmic specification was preferred on *a priori* grounds, two alternative specifications, the linear and the quadratic, were also estimated (but only across all industries, not for individual industries). They did not yield such a good fit (as measured by $\bar{r}^2$) as the semi-logarithmic form, and the results were consistent with those for the semi-logarithmic form which are quoted here (e.g. the quadratic form typically yielded positive signs for the coefficients of the linear term and negative signs for the coefficients of the quadratic term).

Table III gives the results of fitting the semi-logarithmic equation across all industries together for each population separately, with rate of return on net assets as the dependent variable, but using alternative measures of size.

In the latter context, it should be noted that there is an important advantage to using a measure of size other than net assets. Since net assets is the denominator of the dependent variable, using it also as the explanatory variable will mean that any error of observation will lead to a downward bias in the estimate of the slope coefficient *b* (i.e. it will be less positive or more negative) because an erroneously observed high rate of return will be associated with an erroneously observed low measure of size. When value added is used as a size measure, there is a potential bias in the opposite direction since the numerator of the rate of return is a major component of value added.

TABLE III

REGRESSION RESULTS, ACROSS ALL INDUSTRIES TOGETHER, WITH RATE OF RETURN ON NET ASSETS AS DEPENDENT VARIABLE, AND LOG_e SIZE AS EXPLANATORY VARIABLE

Size measure	*Population*	*Coefficients*		$\bar{r}^2$
		a	*b*	
Net assets	1	27.1*	1.1*	0.042
		(15.6)	(5.8)	
	2	29.1*	−1.3*	0.032
		(14.3)	(5.5)	
	3	26.7*	−0.9*	0.008
		(9.7)	(3.0	
Gross assets	1	28.1*	−1.2*	0.049
		(15.9)	(6.2)	
	2	30.6*	−1.4*	0.040

		(14.8)	(6.2)	
	3	28.3*	1.1*	0.011
		(10.0)	(3.6)	
Sales	2	23.2*	−0.5*	0.005
		(10.4)	(2.4)	
	3	19.8*	−0.2	0.001
		(6.7)	(0.5)	
Value added	2	22.7*	0.6*	0.005
		(10.9)	(2.3)	
	3	14.9*	0.4	0.000
		(5.4)	(1.2)	

Notes

* Indicates a point estimate significantly different from zero at the 5% level, using a *t*-test. *t*-values appear in brackets.

The regression equation fitted was the semi-logarithmic equation stated in the text.

a is expressed in percentage points, *b* relates $\log_e$ size to rate of return in percentage points.

The results contained in Table III are consistent with this type of bias being important. There is a clear negative relationship between the rate of return and net assets, which is always statistically significant and quantitatively important (e.g. the coefficient −1.1 for Population I implies that doubling firm size would typically be associated with reducing profitability by 0.72 of a percentage point), although the proportion of the variance of rate of return explained by size $(\bar{r}^2)$is low. A similar relationship holds when gross assets is substituted for net assets. However, when sales is substituted, the value of the slope coefficient, *b*, drops by more than one-half, and in one case (Population 3) is not statistically significant. When value added is substituted, the slope coefficient becomes positive, indicating a weak positive association between size and profitability. In view of the discussion of measurement bias, the results using sales as an explanatory variable are probably the least subject to bias (although profits are a component of sales, so that there may be a slight bias in the direction of a positive value of *b*) and the appropriate preliminary conclusion would be that there is relatively little association between profitability and size but that such as there is, it is in a negative direction.

This conclusion was reached on the basis of aggregating all industries, and does not preclude a different result in the case of any individual industry. Since many of the problems, such as that of concentration, which might lead us to study the relationship between profitability and size, relate to individual industries, it is obviously important to disaggregate the analysis by industry. This was done, and the following summarizes the results for Population 2, the longest period for which data are available for sales. The results for the other populations are consistent with these. The pattern which emerges is one of considerable inter-industry variation, but with the majority of slope coefficients negative and not statistically significantly different from zero. When log net assets is the explanatory variable, 20 out of 24 slope coefficients *(b)* are negative and four of these are statistically significant: when log sales is substituted, 17 out of 24 slope coefficients are negative and two of these are statistically significant. This confirms the ‘all industries’ result that sales has a weaker negative association with profitability than does net assets. It should be noted that 13 of the 24 industry slope coefficients for log net assets and 15

out of the 24 for log sales are less (i.e. more negative) than the negative coefficients obtained for the 'all industries' case. The small number of observations in certain individual industries means that we should not attach much weight to the fact that the coefficients for these industries were not statistically significant at the conventional 5% level.

A final variation of the analysis is to correct for possible heteroscedasticity in the relationship between profitability and size. One method of correcting for heteroscedasticity, e.g. used by Samuels and Chesshire [16], in the study of the relationship between growth and size, is to weight each observation by a measure of size. Investigation of the present data, reported in the next section of this paper, suggests that, as might be expected in the light of earlier studies (such as Singh and Whittington [18] and Whittington [20]), the residual variance of profitability did decline with size of firm. This relationship accounted for a small proportion (always less than one-tenth) of the residual variance and it was a weaker relationship than is implied by linear weighting. Hence, this type of weighting may be regarded as an over-correction for heteroscedasticity, and it is therefore particularly reassuring that the results reported in Table IV, using this form of adjustment, confirm those of Table III, which were subject to heteroscedasticity. The point estimates of both the constant term *(a)* and the slope coefficient *(b)* are close to those obtained in Table III, as are the standard errors, and, consequently, the *t*-values. However, since neither set of results embodies a correct adjustment for heteroscedasticity (Table IV over-compensating to produce heteroscedasticity in the opposite direction),[7] the standard errors are probably biased downwards in both cases.

One obvious extension of the analysis of the relationship between profitability and size is to decompose profitability into its components, the profitability margin and the sales/assets ratio:

$$\text{Profitability} \equiv \frac{\text{Profits}}{\text{Assets}} \equiv \frac{\text{Profits}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}}$$

[7] It is interesting to note that multiplying the rate of return by absolute size (as opposed to log size, which is used here) would mean that the dependent variable was the absolute value of profits. One motive for using a profitability ratio rather than absolute profits in the statistical analysis of the relationship between profitability and size is to remove heteroscedasticity from the relationship: the residual variance of profits being likely to increase with size. Further analysis of the data show that such a relationship is, in fact, present.

TABLE IV

REGRESSION RESULTS ACROSS ALL INDUSTRIES TOGETHER, USING WEIGHTED AGGRESSION

Regression equation

$$R_i . \log S_i = a . \log S_i + b . (\log S_i)^2 + \epsilon_i$$

where R is the rate of return on net assets

S is net assets

	Coefficients		
Population	*a*	*b*	$\bar{r}^2$
1	25.9*	−1.0*	0.853
	(16.3)	(5.8)	
2	27.7*	−1.1*	0.805
	(15.4)	(5.7)	
3	27.1*	−1.0*	0.666
	(11.2)	(3.9)	

Notes: See Table III.

We might expect to find important relationships between these two variables and size, even when, as we have found, the relationship between profitability and size is weak or non-existent. For example, large firms may tend to have larger plants (although Prais [15] demonstrates that large firms are typically multiplant concerns) which are devoted to mass-production on a relatively low profit margin (implying a negative association between size and profit margin) but with a high sales/asset ratio (implying a positive association between size and sales/asset ratio).

Tables V and VI present evidence as to the relationship between these two ratios and size. When net assets is our size measure, there is a negligible positive relationship between the profitability margin and size: bearing in mind the positive bias induced by having profits in the numerator of both variables, we can regard the true coefficient as being zero and possibly even negative, and size explains only a small proportion (1.1%) of the variance. This suggests that the earlier negative relationship between profitability and size (measured as $\log_e$ net assets) was due to the lower sales/asset ratio of larger firms. However, we are again confronted with a possible statistical bias: the slope coefficient is subject to downward bias because net assets is (in logarithmic form) the explanatory variable and the denominator of the dependent variable. The potential importance of this type of bias is illustrated by the results of using sales as the size measure. In this case, the relationships are reversed: the profitability margin has a negative association with size and the sales/asset ratio a positive association, and the coefficients are statistically significant in each case. However, these coefficients may be inflated by bias, since the bias is also now in the opposite direction. When the compromise size measure value added is used, both the sales/asset ratio and the profitability margin are virtually independent of size, and this seems to be the most reasonable inference to draw from the results. Even those results which were subject to possible bias were not of great quantitative importance (in terms of the values of the

coefficients, e.g. the highest value, −0.9, implies that doubling sales should typically imply a rise of 0.6 of a percentage point in the profitability margin), and the proportion of the variance explained was very low (the highest value of $\bar{r}^2$ was 0.064, implying that 6.4% of the variance of the sales/asset ratio could be explained by $\log_e$ sales).

Although the results of this section of the analysis are largely negative, no important positive or negative relationships having been revealed, the results have drawn attention to the sensitivity of the results to the choice of size measure. This problem has been recognized for some time (e.g. Johnston [7]), but some investigators such as Bates [1] and Newbould and Wilson[14] have established that there is a strong positive association between alternative measures of firm size. This association does not mean that these measures can be used as proxies for one another without introducing potentially misleading sources of bias in statistical estimates.

TABLE V

REGRESSION OF PROFITABILITY MARGIN ON $\log_e$ SIZE, ACROSS ALL INDUSTRIES

Size measure	*Population*	*Coefficients* *a*	*b*	$\bar{r}^2$
Net assets	2	9.2*	0.1	
		(7.2)	(0.7)	−0.001
	3	8.8*	0.1	
		(6.7)	(0.4)	−0.001
Sales	2	18.5*	−0.9*	
		(137)	(6.3)	0.042
	3	16.6*	−0.7*	
		(11.9)	(5.3)	0.024
Value added	2	10.5*	−0.0	
		(8.1)	(0.2)	−0.001
	3	7.7*	0.2	
		(5.9)	(1.3)	−0.001

Notes: See Table III.

TABLE VI

REGRESSION OF SALES/ASSETS RATIO ON $\log_e$ SIZE, ACROSS ALL INDUSTRIES

Size measure	*Population*	*Coefficients* *a*	*b*	$\bar{r}^2$
Net assets	0	4.6*	−0.2*	
		(8.7)	(3.3)	0.001
	3	5.1*	−0.2*	

		(9.1)	(3.5)	0.010
Sales	2	−1.2*	0.4*	
		(2.1)	(7.3)	0.057
	3	−1.9*	0.5*	
		(3.2)	(8.7)	0.064
Value added	2	3.2*	−0.0	
		(5.9)	(0.6)	−0.001
	3	3.2*	−0.0	
		(5.7)	(0.0)	−0.001

Notes: See Table III.

V. SIZE AND THE DISPERSION OF PROFITABILITY

The relationship between the dispersion of profitability and size is of interest in its own right, not merely as an indicator of the degree of heteroscedasticity affecting the estimation of the relationship between average profitability and size. We might expect large firms to be more diversified, which would, on the familiar 'swings and roundabouts' argument lead to their having relatively stable individual profitability through time and relatively low inter-company dispersion of profitability during any particular period of time. On the other hand, to the extent that diversification led to their profits being derived from a greater variety of activities which persistently earned different rates of return, this might actually lead to a greater inter-firm dispersion amongst large firms which were classified as belonging to the same industry, such a classification being arbitrary for a diversified firm. Thus, we might expect to find less systematic relationship between the dispersion of profitability and size at the industry level than when we pool firms across all industries. Finally, there may be managerial reasons for large firms exhibiting less dispersion of profitability between firms or through time, in so far as they tend to be more bureaucratic, managed by employees rather than owners, with greater risk aversion, and perhaps less entrepreneurial flair but a higher minimum level of competence. Thus, on *a priori* grounds, we would expect the inter-firm dispersion of profitability to decline with firm size, particularly when the firms are pooled together over all industries, and this is consistent with the results of earlier work (e.g. Whittington [20]).

The residuals from the regressions of rate of return on size, described earlier, were investigated using the tests for heteroscedasticity proposed by Glejser [4] and Breusch and Pagan [2]. There was clear evidence that the dispersion of the residuals declined with size, but not to the extent assumed by the weighted regressions reported at the end of the previous section. The Breusch and Pagan test suggested that the null hypothesis of homoscedasticity could be rejected at the 5% level in all cases in which firms were pooled across industries, and also in a minority of cases when the data were disaggregated by industry. The latter result partly confirms the prediction (in the preceding paragraph) that there might be a less systematic relationship on the individual industry level, although it is partly a result of the very small number of observations in certain industries, which makes it less likely that the null hypothesis will be rejected.

We conclude that there is a significant but small degree of heteroscedasticity in the cross-sectional relationship between profitability and size, the variance of residual profitability declining as the size of firm increases. In this sense, large firms tend to be more stable. This seems to apply within individual industries as well as across the whole population, so it is not solely due to the conglomerate nature of large firms, spanning different industries and averaging across them, although it could be due to a similar effect across industrial subgroups within the rather broad industries (the two-digit Standard Industrial Classification) used in this study. Another important dimension of stability is the stability through time of the individual firm and it is to this that we now turn.

VI. SIZE AND THE VARIABILITY OF PROFITABILITY

The variability of its rate of return through time is a measure of the degree of risk attaching to investment in the individual firm. Modern capital market theory (e.g. Sharpe [17]) suggests that the investor has the opportunity to construct a diversified portfolio and will be primarily interested in the relationship between variations in the returns of the individual firm and those obtainable elsewhere in the market (i.e. the so-called 'beta coefficient', relating the returns of the individual firm to those of the market portfolio): any variations in the individual firm's returns which are not correlated with those of other firms are regarded as unsystematic risk, which can be eliminated by choosing a large enough portfolio. However, even in this framework, absolute variability can perform a useful role as an indication to investors of the probability of complete failure of the firm, due to the occurrence of large losses. The probability of failure is, of course, something which managers and other employees of the firm will wish to minimize. The absolute variability of profitability will also be especially important to those investors who do not diversify their portfolios, e.g. because they wish to maintain a controlling stake in the company, and to those employees who receive commissions or bonuses related to profitability.

At the beginning of the previous section various reasons were given for expecting the inter-firm dispersion of profitability to decline as firm size increases. Two of these are also applicable to the relationship between the size of firm and the variability through time of its profitability. Firstly, the 'swings and roundabouts' argument suggests that greater diversification, which is probably associated with greater size, will increase the intertemporal stability of profitability if there is a degree of independence in the returns to the various types of investment: in such a case the firm is investing in a diversified portfolio on the shareholder's behalf, partially relieving him of the need to diversify his own portfolio. Secondly, the argument that larger firms are probably more often managerially controlled will probably lead to a policy of risk-aversion in the selection of investment,[8] because of the desire to avoid complete failure and maintain managerial employment and rewards.

[8] Note that this implies that the risk of individual investments is appraised in terms of their contribution to the firm's portfolio, not in terms of the absolute variability of their returns.

Two types of measure of the inter-temporal variability of rates of return were used: the standard deviation from the firm's average profitability for the period, and the standard deviation of the variation of profitability from a time trend for the period. The two measures imply different concepts of variability, one including changes due to a secular trend, which might not be regarded as involving the same degree of uncertainty as random variation, whereas the other (variation from the trend) excludes such changes. In fact, when both measures were calculated, they gave similar results. A linear time trend was fitted by ordinary least squares. The trend coefficient was important in a considerable number of cases: although its average value was zero, it was significantly greater than zero at the 5% level in 165 companies out of 735 for Population 1, and there must have been a comparable number of cases in which it was significantly negative, to produce the zero average. The deviation from a trend was calculated only for Population 1, which covered the longest period (1960–74) and which was therefore likely to be the most affected by a secular trend.

Table VII gives some results of regressing variability of profitability on size where variability is measured, alternatively, as standard deviation from the mean (section (1)) and from the time trend (section (2)). In all instances there is a negative relationship between size and variability which is statistically significant but which explains a low proportion of the inter-firm variance of the variability measure. Thus size is only one of many factors affecting inter-firm variations in the stability of profitability.

The analysis was also carried out in disaggregated form, at the industry level. The following results were obtained for the case in which variability is measured as deviation of profitability from a time trend, the measure of profitability is rate of return on net

TABLE VII

REGRESSION RESULTS: VARIABILITY OF PROFITABILITY EXPLAINED BY LOG SIZE, ACROSS ALL INDUSTRIES TOGETHER, POPULATION 1, 1967–74

Definition of variables		*Estimated coefficients*		
Profitability	*Size*	*a*	*b*	$\bar{r}^2$
(1) *Variability measured as standard deviation from mean*				
Rate of return on net assets	Net assets	13.2*	−0.8*	0.079
		(14.7)	(8.0)	
Rate of return on gross assets	Net assets	10.7*	−0.7*	0.091
		(15.3)	(8.6)	
(2) *Variability measured as standard deviation from time trend*				
Rate of return on net assets	Net assets	10.9*	−0.7*	0.081
		(14.7)	(8.1)	
Rate of return on gross assets	Net assets	8.4*	−0.5*	0.082
		(14.8)	(8.2)	

Notes: See Table III.

assets, and the size measure is log net assets, for Population 1. The slope coefficient *(b)* is negative in 22 of the 24 industries and is statistically significantly less than zero at the customary 5 % (2½% level if we were to regard this as a single-tailed test) in seven industries. It should also be noted that five of the industries which did not yield significant coefficients contained six or less firms for Population 1, allowing four or less degrees of freedom in the regression. The overall result is, therefore, that the variability of the individual firm's profitability through time decreases as the size of firm increases within the same broad industry group, as well as across all firms. The proportion of variance explained is generally low, indicating that there are other important factors determining the stability of profits, so that small firms do not necessarily have unstable profits if these other factors favour stability. There is a degree of inter-industry variation in the slope coefficient, but the 'all industries' value of −0.7 would be fairly typical (three of the individual industry values are exactly equal to it) and only two of the individual industry coefficients would be statistically significant if we substituted −0.7 for zero as the benchmark for our significance test. If we accept −0.7 as our best estimate, this implies that doubling the size of firm would, on average, tend to be associated with a decline of roughly one half of a percentage point (−0.7×0.69) in the standard deviation of the rate of return measured from a time trend. This is a perceptible benefit of size, but not quantitatively very important.

Table VIII carries the analysis further by exploring the time variability of the components of the rate of return: the profitability margin and the sales/ asset ratio. It seems that it is the greater stability of the profitability margin which gives rise to the relatively stable rates of return of the larger firms. In the case of the regression of the variability of the profitability margin on log size, the slope coefficients are negative and statistically significant in each case. Of the three estimates, we would place least reliance on that which uses sales as the size measure, as this is also the denominator of the

TABLE VIII

REGRESSION RESULTS: VARIABILITY OF PROFITABILITY MARGIN AND SALES/ASSET RATIO EXPLAINED BY LOG_e SIZE, ACROSS ALL INDUSTRIES TOGETHER, POPULATION 2, 1967–74

	Coefficients		
Size measure	*a*	*b*	$\bar{r}^2$
(1) *Dependent variable: standard deviation of profitability margin*			
Net assets	4.4*	−0.2*	0.028
	(10.8)	(5.2)	
Sales	6.1*	−0.4*	0.078
	(14.1)	(8.7)	
Value added	5.0*	−0.3*	0.045
	(12.2)	(6.6)	
(2) *Dependent variable: standard deviation of sales/asset ratio*			
Net assets	60.0*	−1.8	0.000
	(4.2)	(1.1)	

Sales	−45.7*	9.2*	0.037
	(3.0)	(5.9)	
Value added	51.2*	−0.9	−0.001
	(3.5)	(0.5)	

Notes
Sales data were available only from 1968 onwards, so the analysis had to be confined to Population 2. Because of the shortness of the period (seven annual observations) standard deviation from a time trend was not calculated.
The dependent variable is measured in percentage points.
* Indicates statistically significant difference from zero at the 5% level (two-tailed *t*-test).

dependent variable, so that the estimated coefficient is likely to be biased downwards. When the variability of the sales/asset ratio is regressed on log size, the slope coefficient is negative but not statistically significant in the two cases which are most reliable. In the third case, in which sales is the size measure, the coefficient is positive and statistically significant, but this may be a consequence of the upward bias imparted by sales being in the numerator of both the explanatory and the dependent variables.

In conclusion, it seems that the time variability of the rate of return does decline with the size of firm to a perceptible extent, although there are clearly other factors which, taken together, are of much greater importance. The greater stability of the rate of return of larger firms appears to be due to the stability of the profit margin rather than the sales/asset ratio. In other words, larger firms suffer the same fluctuations in capacity utilization which are faced by smaller firms, but the larger firms are relatively successful in maintaining their profit margins constant in the face of such fluctuations. This result is of considerable interest for the formulation of hypotheses relating to industrial pricing.

VII. GENERAL CONCLUSION

It was emphasized earlier that only very limited inferences can be drawn from the simple relationship between profitability and firm size. The results of this study are of use mainly as a description of certain broad relationships which exist between profitability patterns and the size of firms and which require further exploration by means of much more sophisticated models of firm behaviour.

The following broad picture has emerged:

1. Average profitability is largely independent of firm size, but such relationship as there is tends to be negative.
2. The inter-company dispersion of profitability tends to decline with firm size, although the relationship is not a strong one.
3. The variability of profitability through time also declines with firm size, although again the relationship is not particularly strong.

Conclusions 1–3 confirm those of the author's earlier work (Whittington [20]). Larger firms are perhaps less profitable than smaller ones, but this is compensated for by greater stability.

4. Average profitability margins and sales/asset ratios do not, on average, appear to vary systematically with firm size.
5. The profitability margins of large firms tend to be relatively stable through time, whereas their sales/asset ratios do not. Thus, the relative stability through time of the rates of return of large firms is due to the relative stability of their profit margins, rather than the stability of their capacity utilization.
6. In a number of instances, we have found the results to be very sensitive to the measure of size used. This is not surprising, since the dependent variable is typically a ratio which incorporates a size measure in its numerator or its denominator. It is, however, an important demonstration that the existence of a high degree of correlation between alternative size measures does not mean that they can be used as proxies for one another without regard to the possible statistical biases which may result.

With regard to incentives to greater industrial concentration, it is clear that profitability does not, on average, provide an incentive for larger firms to grow at a relatively high rate. Equally, it does not provide them with the means for greater growth, in terms of a high level of profits which might potentially be retained. There does appear to be some reward for size in the form of greater stability of the rate of return through time and in the form of less inter-firm variation of profitability, so that size brings a better prospect that profitability will be adequate. However, these benefits could be reaped by the shareholder, probably with greater effectiveness and more flexibility, by buying a mixed portfolio of shares of smaller firms. The most obvious beneficiaries of the relatively stable performance of larger firms are their managements and employees, who are necessarily committed to one firm, and who are less likely to find themselves involuntarily unemployed in bad times if their firm has a relatively stable performance. This stability appears to be achieved partly by the stability of profit margins of large firms, and this raises the possibility that they may exercise some degree of monopoly power which they are able to exploit to maintain their margins in bad times. However, this is purely speculative and, as was emphasized at the beginning of this paper, the identification of such important phenomena as monopoly profits or economies of scale requires more sophisticated models and more detailed and reliable data.

Finally, there is an interesting complementarity between the above conclusions and those obtained from recent investigations of mergers. Singh [19] found that the main characteristic distinguishing taking-over from taken-over firms was their size, so that size can be regarded as a form of protection for management against take-over. Newbould [13] found that strategic motives, such as control over markets and other environmental factors, seemed to dominate in the take-over decision, and Meeks [12] established that the post-merger profitability of companies was disappointing relative to pre-merger profitability. These results taken together suggest that take-overs and mergers are largely initiated to create or maintain large companies with relatively poor profitability but with stable market environments over which they have some control. This is clearly for the benefit of management rather than shareholders, and is entirely consistent with the observations made earlier, that large firms have relatively mediocre average profitability but greater stability of profitability than small firms.

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THE PROFITABILITY OF RETAINED EARNINGS

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A recent paper by Baumol, Heim, Malkiel and Quandt (1970) (hereafter referred to as BHMQ), estimated the relative rates of return on retained earnings, debt, and equity financing in United States corporations. The present paper summarises some results of my recent study (chapter 5, 1971) which investigates the effect of external financing on the future profitability of British quoted companies. The results of this study, which differs both in methodology and data used, are then compared with the BHMQ results. The comparison yields two important insights into the interpretation of the BHMQ results, whilst confirming the general conclusion that retained earnings seem to be used less profitably than external finance.

I Theoretical Background of the Model

This study, like the BHMQ study, was partly stimulated by Baumol's book *The Stock Market and Economic Efficiency* (1965). The essential object of the exercise is to quantify the effects of stock market discipline, i.e., to discover to what extent, if any, the process of raising finance through the market leads to a more efficient use of funds, in terms of profitability, than internal financing. The answer to this question is clearly relevant to government policies, such as dividend restraint or corporation taxes, which discriminate against the distribution of profits and encourage finance by retained profits, bypassing the stock market.

We should expect the discipline of the market to work in two ways. Firstly, the return *on the new funds raised* should be one which the market regards as satisfactory; otherwise the dividends and interest on the new capital will be paid partly at the expense of the existing shareholders. Secondly, raising external finance will usually be accompanied by encouraging plans and forecasts concerning the *overall* profitability of the company because the subscribers of the finance will have to look to the aggregate profits of the company rather than the profits on the specific funds which they have subscribed, to provide them with dividend or interest payments.

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The first of these effects, the high return on the new funds invested, is derived from assumptions of a broadly neoclassical type. The objective of the firm is assumed to be to maximise the net present value of existing equity. It is assumed that this objective tends, in general, to be achieved, and is not frustrated by the incompetence of management or by mistakes made as a result of uncertainty about the future. This seems to be the type of theory which BHMQ have in mind. If their argument (1970, pp. 354–355 and figure 1) is accepted, a greater amount of incremental investment would tend to be associated with a higher average rate of return on investment and with a greater amount of new external financing. However, the latter result depends upon the assumption that the marginal efficiency of investment schedules have similar shapes for different firms (1970, figure 1) and, perhaps more crucially, on the assumption that expectations are fulfilled. If expectations fail to be fulfilled, then the firms expanding most (and which raise most external finance) will include some which have invested beyond the margin of profitability as a result of overoptimism, and those which expand least (and which rely on internal finance) will include some firms which have not invested up to the margin of profitability, due to excess caution. It is possible, therefore, that the rate of return on new investment may be negatively correlated with the amount of external finance raised, once we introduce uncertainty.

The subsequent empirical study relies on the observation of overall rates of profit of individual firms, i.e., the rate of return on new and existing assets taken together. The idea that new external finance tends to be more profitably used than new internal finance, is taken to imply that a firm raising a greater amount of external finance will tend to have a higher level of overall future profitability than an otherwise similar firm raising less external finance. The words “otherwise similar” in this context imply similar growth rates (in asset terms) and similar profit rates, during the period in which the explanatory variables are observed. The growth rates of the firms compared must be similar; otherwise arguments such as those adduced in the preceding paragraph about the possible relationship between the rate of profit on new investment and the amount of new investment, may apply.[1] The profit rates, in the “starting” period must be the same because they presumably have a bearing upon the likely future profitability of existing assets, and this, together with the return on new assets, will determine overall profitability in the future.

The second way in which market discipline might affect firms making new issues, by requiring a higher overall future return on existing assets in such firms, can be derived from the type of assumptions which are commonly associated with modern “managerial” theories of the firm. It is assumed that there is considerable uncertainty in the minds of potential stock and shareholders as to the probable return on their investment, and that this uncertainty will be alleviated if the firm can produce an encouraging forecast about its overall profitability, rather than merely about the profitability of the new investment

[1] Even then, the argument is not strictly watertight; the firms must be the same size before the same rates of growth imply the same amounts of investment. Alternatively, the extent of profitable investment opportunities could be assumed to be proportional to the size of the firm, in which case, equality of proportionate investment (i.e., growth of assets) is sufficient.

which it is financing. This hypothesis implies that externally financed firms' overall rates of profit will be higher in the future than they were in the past, but that the *extent* of external financing would not necessarily affect the extent of the improvement in the rate of return.

In the subsequent empirical analysis, this type of theory is taken to predict that, as between two otherwise similar firms (where similarity, as described earlier, implies similar profit rates and growth rates in the period in which the explanatory variables are observed) the firm raising external finance will have the higher future profitability. In other words, it is the *event* of raising external finance, rather than the *extent* of the amount raised, which improves future profitability.

One final point which deserves emphasis is that, in speaking of 'discipline' and the 'effects' of going to the stock market, we are describing a process which may well be one of selection rather than causation. The market requires a certain level of future prospects from a firm which applies to it for funds, but this does not necessarily imply that the profitability of such firms is improved as a consequence of going to the market; such firms might have good prospects anyway. On the other hand, it is possible that the need to satisfy the capital market's requirements may encourage firms to search for methods of improving their profitability; a "managerial" approach to the theory of the firm would suggest that the process of raising external finance gives rise to one of the few occasions upon which existing or potential shareholders have real power to influence future management.[2] The purpose of this paper is not to attempt to distinguish between these alternative ways in which the market's discipline might work, but to assess whether the overall consequence of the market's discipline is, in fact, that firms which have been subject to it have higher future profitability than otherwise similar firms which did not go to the market.

II The Data and the Variables

The data and the variables used in the present study are described in more detail by Singh and Whittington (1968), and Whittington (1971). The basic data are the published consolidated accounts of all companies engaged primarily in manufacturing or distribution in the United Kingdom and having debt or equity stocks quoted on a United Kingdom stock exchange. The study covers a total of 1,955 companies which continued an independent existence throughout the period between 1948 and 1960.

The following variables were calculated for each company:

(1) *Profitability.* This consists of profits before taxation, dividends or interest on loan stocks, but after depreciation, divided by the book value of net assets, where net assets are equal to equity *plus* loan stocks *plus* reserves.

[2] Another such occasion, prominent in the work of Marris (1964), is, of course, when a take-over bid is made for the firm.

(2) *Growth.* This consists of the compound annual rate of growth of net assets as defined above. It includes growth which takes place as a result of take-overs.

(3) *External Growth.* This consists of the annual compound rate at which net assets increased as a result of new external finance. This includes external finance issued in the course of take-overs, and increases in minority interests in subsidiary companies.

III The Model and Results

A cross-sectional model was estimated in order to answer two basic questions arising from the earlier theoretical discussion: (1) Does greater external financing seem to be associated with higher future profitability? (2) Do externally financed firms tend to be more profitable in the future than firms relying solely on internal finance?

In terms of the present data, these questions were answered by fitting the following regression equations:

$$P_{i,t} = a + b \cdot E_{i,t-1} + \epsilon_{i,t} \ldots\ldots \tag{1}$$

where

P is profitability
E is external growth rate
ϵ is a random error, with mean zero
i refers to the i^{th} company
t refers to the period 1954–1960
$t-1$ refers to the period 1948–1954
and

$$P_{i,t} = c + d \cdot D_{i,t-1} + \epsilon_{i,t} \ldots\ldots \tag{2}$$

where D is a dummy variable equal to 1 when E exceeds 0.01 (1 per cent per annum), and is otherwise zero.[3]

The results of fitting this equation across all continuing companies (1,955 in number) are given in the first two rows of table 1. The superficial conclusion to be drawn from this is that the effects of external financing are negligible, i.e., that the stock market exerts no discipline. Neither explanatory variable has a regression coefficient which is statistically significant at the 5 per cent level, despite the huge number of observations, and the quantitative impact is small, e.g., the value 0.84 relating to D implies that firms which raised external finance in 1948–1954 had profitability in 1954–1960 which was, on average, only 0.84 percentage points above that of the internally financed firms.

[3] E between zero and 0.01 is often due to an increase in minority interests arising from the retention of profits by subsidiaries. This is clearly not a case in which 'market discipline' could be exercised. A detailed examination of a random sample of 80 companies in which E exceeded 0.01, showed that these companies all made substantial new issues.

However, the specification of the model can be improved. Earlier research by the present author (1968) has shown that past profitability is a strong determinant of future profitability. This is confirmed by line (3) of table 1, which gives the results of the following regression equation.

$$P_{i,t} = e + f \cdot P_{i,t-1} + \epsilon_{i,t}.$$

The value of the coefficient f (0.52), which is statistically significant at the 5 per cent level, suggests that, on average, one half of aboveor below-average profitability in 1948–1954 tended to persist in 1954–1960. For example, firms whose rate of return was 10 percentage points above the average for all firms in 1948–1954 would tend to have a rate of return 5 percentage points above the average in 1954–1960. Similarly, firms whose rates of return were below-average in the earlier period would tend to improve their relative position by being nearer the average in the later period.[4]

Clearly, the past profitability of a firm has important implications for its future profitability which are independent of whether or not it is externally financed, and a properly specified model to test the effects of external financing on future profitability must allow for this. Serious bias may be introduced by the absence of past profitability from equations (1) and (2). For example, if firms which raised external finance tended to have below-average profitability, external financing might appear to be negatively associated with future profitability, if the profitable use of the new external finance led to future profitability being below the average for all firms, but higher than would have been predicted by the very low average past profitability of the externally financed firms.

This potential source of bias was eliminated by adding past profitability as an explanatory variable to equations (1) and (2), respectively. The results are reported in lines (4) and (5) of table 1 and are not promising. External financing still appears to have a negligible effect on future profitability.

The specification of the model can be further elaborated by introducing past growth as an explanatory variable into each of our two basic models, as was suggested in the earlier theoretical discussion. It will be recalled that the rationale for introducing past growth as an explanatory variable was that growth itself may be bad for profitability, at least beyond a certain level. In particular, the process of investing up to the margin may require a profitmaximising firm [5] to lower its overall *rate* of profit in the cause of

[4] The wider implications of this are discussed at length in chapters 4 and 5 of Whittington (1971).

[5] We should note a slight obscurity of terminology. Profitability as measured in this empirical study is not the Marshallian concept of profit. The latter definition would require that we deduct an opportunity cost rate of interest from profits as measured by the accounts. Furthermore, we should note that the rate of return used in this empirical study is that on net worth, rather than that on equity, which would be more appropriate to profit-maximising considerations.

TABLE 1.—REGRESSION RESULTS

Equation Number	Regression Coefficients: Explanatory Variable to Which the Regression Coefficient Relates[a] *G*	*P*	*E*	*D*	*D′*	$\bar{r}^2$
(1)			0.059 (±0.048)			0.000
(2)				0.84 (±0.45)		0.001
(3)		0.52b (±0.02)				0.347
(4)		0.52b (±0.02)	0.005 (±0.038)			0.347
(5)		0.52b (±0.02)		0.53 (±0.36)		0.347
(6)	−0.18b (±0.06)	0.59b (±0.03)	0.177b (±0.070)			0.349
(7)	−0.13b (±0.04)	0.57b (±0.02)		1.40b (±0.46)		0.350
(8)		0.53b (±0.02)			1.23b (±0.46)	0.349
(9)	−0.1 1b (±0.04)	0.59b (±0.02)			1.91[b] (±0.51)	0.351

Notes: Each equation is estimated across a total of 1,955 firms. Profitability in 1954–1960 is always the dependent varible. Each explanatory variable is calculated over the period 1948–1954. The explanatory variables are described in the text. Each equation involved regressing profitability in 1954–1960 on the set of explanatory variables shown, plus a constant term. Only linear equations were estimated. The regression coefficients relating to *D* and *D′* are expressed in percentage point's of profitability for 1954–1960.

[a] *G*=growth, *P*=profitability, *E*=esternal growth, *D*=external growth demmy, *D′*=external growth and low profitability demmy.

[b] Indicates a regression coefficient which is statistically signifantly different from zero at the 5 per cent level.

maximising total profit.[6] External financing may tend to be associated with very high levels of growth and may therefore "receive the blame' for the effect of high growth in lowering the future rate of profit. By introducing growth as an explanatory variable, we hope to identify the *independent* influence of external financing on future profitability.

[6] Other reasons for high growth rates causing lower profitability are discussed extensively by Penrose (1959). The tendency for profitability to decline as growth rises above a certain level is often described as "The Penrose Effect." However, this relationship is concerned with the effect of current growth on current profitability. Here we are concerned with the longer-term effects of growth.

At this stage, it is worth drawing attention to table 2, which gives the matrix of zero-order correlation coefficients between the explanatory variables. It will be observed that, although there is a considerable amount of positive correlation between certain pairs of variables, this does not occur to such an extent that the estimation problem of multicollinearity is likely to arise. The correlation coefficient is never greater than 0.71 (r^2=0.5), indicating that at least half of the variance of any explanatory variable is incapable of being explained by linear regression on any other explanatory variable. Each explanatory variable therefore exhibits an important degree of independent variation.

TABLE 2.—MATRIX OF CORRELATIONS BETWEEN THE EXPLANATORY VARIABLES USED IN THE REGRESSION ANALYSIS

Variable	*G*	*P*	*E*	*D*	*D′*
Growth, *G*	1.0	0.64	0.67	0.49	0.14
Profitability, *P*	0.64	1.0	0.04	0.03	−0.28
External Growth Rate, *E*	0.67	0.04	1.0	0.71	0.46
External Growth Dummy, *D*	0.49	0.03	0.71	1.0	0.67
'External Growth and Low Profitability' Dummy, *D′*	0.14	−0.28	0.46	0.67	1.0

Note: The number in each cell is the value of the simple (zero-order) correlation coefficient, *r,* between the relevant pair of variables. The matrix of coefficients is, of course, symm metrical about the principal diagonal.

AVERAGE VALUES OF THE VARIABLES

Variable	*G*	*P*	*E*	*D*	*D′*
Average value (in percentage points)	7.4	19.3	1.9	32.5	17.8

Note: Each variables is observed across 1,955 companies, during the period 1948–1954.

The results of introducing past growth as an explanatory variable are reported in equations (6) and (7) of table 1. They show that, when the independent influence of past growth and past profitability are removed, external financing, measured either way, has a statistically significant positive influence on future profitability. The value of the coefficient relating external financing to future growth is higher in each case. In the case of the dummy variable, *D* in equation (7), the value of the coefficient (1.40) implies that the average firm which raised external finance in 1948–1954 had profitability in 1954–1960 which was 1.4 percentage points higher than that of firms which did not raise external finance but which had similar rates of profitability and growth in 1948–1954. The value of the coefficient pertaining to the external growth rate, *E,* in equation (6) of table 1 is 0.177, which implies that 10 percentage points higher-than-average external growth would tend to be associated with 1.77 percentage points higher-than-average future profitability, amongst firms with identical past profitability and growth.

A comparison of the results of equations (6) and (7) suggests that the latter is a more accurate specification, since the coefficient of determination $(\bar{r}^2)$is slightly higher in this case. In other words, the fact that a firm raised new finance (represented by the dummy variable *D*=1 in equation (7)) provides a slightly better explanation of its subsequent profitability than the actual extent of the external finance raised (represented by the value

of *E* in equation (6)). We have, of course, fitted only linear equations, and there may be a powerful but nonlinear relationship between the extent of external financing and future profitability. Nevertheless, the result suggests that the discipline of the market arises out of the actual *event* of going to the market rather than on the *extent* of the finance raised. This seems to be more consistent with the second type of market discipline described earlier (encouraging plans and forecasts relating to the firm's *overall* profitability) rather than the first (a high rate of return *on the funds actually raised*).

A final refinement of the analysis is contained in equations (8) and (9) of table 1. This introduces a new dummy variable D' which is equal to one when the firm resorted to substantial external finance in 1948–1954 (i.e., $D = 1$) and, in the same period, had profitability below the average for all firms. In other circumstances, D' is equal to zero.

The rationale of this new variable is that a company which was already achieving aboveaverage profitability could be regarded as be-ing satisfactory from the market's point of view if it continued to have above-average profitability. A firm which had a very high historical *rate* of profit would probably have to lower its future rate of profit if it were to fulfil the classical *total* profit-maximising criterion by investing up to the margin. We should therefore expect that the discipline of the stock market, if it were effective, would necessarily be reflected in higher future profitability only amongst those firms which had below-average past profitability.[7] The dummy variable D' attempts to estimate the extent of this effect by isolating those externally financed firms whose past profitability was below the average for all firms.

Equation (8) shows that, when the new variable D' is used in conjunction with past profitability as an explanation of future profitability, the new variable performs better than did either of the earlier external financing variables, *E* and *D* (equations (4) and (5), respectively). The parameter is significantly greater than zero, at the 5 per cent level, and its value suggests that the externally financed firms with below-average past profitability had an average future profitability 1.23 percentage points higher than similar firms (in terms of past profitability) which relied on internal finance. Thus, market discipline does appear to affect this important group of firms, even before account is taken of the independent influence of past growth on future profitability.

The result is even stronger when past growth is added to the explanatory equation (equation (9)). This would be expected in view of the earlier theoretical discussion and empirical results, which suggested a positive association between external financing and growth and a negative association between growth and future profitability. The average future profitability of externally financed firms with below-average past profitability is now 1.91 percentage points higher than that of otherwise similar firms (in terms of past growth and past profitability) which relied on internal finance. The goodness of fit of this equation (expressed in the value of $\bar{r}^2$) is marginally better than that obtained in any of the eight preceding equations. The fact that external financing has its greatest impact amongst firms with belowaverage past profitability suggests that the discipline of the

[7]Assuming, of course, that the market requires that new investment shall yield at least the average rate of return.

market is of a type which eradicates low profitability rather than making high profitability higher. This is consistent with the types of market discipline discussed earlier.

IV Empirical Conclusions

The main empirical conclusion of this study is that the discipline of the stock market tends to have a definite but rather small impact on the future rate of return of firms, particularly amongst firms whose past rates of return were below-average.

The impact would have appeared to be quantitatively much larger had the difference in future profit rates been attributed solely to the new external funds raised (as is done in the BHMQ study, comparison with which is made in the next section). However, a secondary conclusion of this study suggested that this is not a realistic way of assessing the impact of market discipline; the *event* of going to the market proved to be of more explanatory significance (in terms of the goodness of fit, $\bar{r}^2$) than the *extent* of external financing, i.e., the dummy variable *D* was usually a rather more powerful explanatory variable (and never a less powerful one) than the external growth variable, *E*.

There are, of course, a number of potential biases in the data, which are discussed at greater length by Whittington (1971) (particularly in chapter 5). The most important of these is that our growth, profitability and external financing variables all include the effects of take-overs. Since there is some tendency for taking-over firms to have higher rates of return, in terms of book values, than taken-over firms,[8] the subsequent consolidation of the taken-over firm into the accounts of the holding company will tend to introduce a downward bias into relative future profitability as measured in the consolidated accounts. A further downward bias will be introduced if revaluation of assets tends to occur in conjunction with take-overs. Since many take-overs are associated with new issues of external finance (a share-for-share exchange is regarded as a new issue of external finance by the holding company), these two sources of downward bias may affect externally financed firms much more frequently than the others.

Finally, our specification of the variables and the model has been arbitrary and more extensive research, involving different combinations of models and variables, might yield different results. For example, the rate of return could be measured as a return on equity rather than on net assets and other time lags than the six-year one used above could be used. However, it should be noted that the BHMQ results, which were more exhaustive in this sense, did not seem to be very sensitive to the particular variables used or to the time lag employed.

[8]See A.Singh (1971).

V Comparison with BHMQ

The broad conclusion that the stock market *docs* discipline firms holds for both this study and the BHMQ study. Having regard to the differences in data (this study refers to United Kingdom firms, whereas BHMQ studied United States firms) and in the form of the basic model, this result is one of reassuring consistency. However the present study has provided at least two insights into how the discipline of the market works and, consequently, into the meaning of the BHMQ results.

The first important insight into the BHMQ results is that the present study has suggested that the *fact* of raising external finance is more important than the *amount* raised. This suggests that the BHMQ approach of estimating a notional rate of return on external finance may be misleading, because the process of going to the market appears, typically, to give rise to an improvement in the overall profitability of the firm, independently of the amount of external finance raised. The additional profits may well come from the better use of existing capital rather than from the highly profitable use of the new capital raised.

This brings us to the second insight into the BHMQ results which can be obtained from our analysis. BHMQ were concerned to relate the absolute amounts of finance raised from various sources to the absolute amount of incremental profits in the succeeding period. This assumes that incremental profits are attributable to incremental capital and, therefore, that the rate of return on existing capital remains constant. Our model was specified in terms of the overall rate of return rather than the absolute amount of incremental profits and was able, therefore, to allow for the fact that the past level of overall profitability raises certain presuppositions as to the future level of overall profitability (equation (3) onwards). It seems that the profitability of the individual firms tends to move towards the mean for all firms (equation (3)), i.e., above-average profitability and below-average profitability both tend to disappear.[9] The latter result raises the possibility of a downward bias in the BHMQ estimate of the rate of return on new retentions. Evidence already published by Singh and Whittington (1968) suggests that the retention ratio is probably slightly higher in firms having a higher profit rate. Thus, the more profitable firms will tend to have a greater absolute amount of retentions,[10] provided that they are not, on average, smaller than the less profitable firms.[11] In the future, the more profitable firms will tend to decline in profitability relative to the less profitable firms, because the profitability of both groups will tend, on average, towards the industry mean. The firms with above-average profitability will therefore

[9] This result confirms the results of Stigler (1963) for United States firms.
[10] This will occur even if the retention ratio is invariant to the rate of profit.
[11] Average profitability is, in fact, independent of firm size. See Whittington (1971), chapter 3.

exhibit two characteristics: above-average retentions (in absolute terms) and a tendency for the overall rate of return to decline. The declining rate of return will not necessarily be due to the unprofitable use of new investment, but an analysis such as that of BHMQ attributes it solely to this. In fact, the declining profit rate may be due to a variety of causes, having a bearing on the profitability of all the assets of the firm, not merely that of its newly invested assets. For example, the loss or decline of any trading advantage which had given rise to above-average profitability in the past would account for the relapse to average profitability.[12]

However, this aspect of BHMQ's explanation of changes in the rate of return probably causes a bias which works systematically against the rate of return on retained profits, because it has been found [13] that a greater proportion of growth is internally financed amongst the more profitable firms. Perhaps surprisingly, there is no evidence that the firms raising external finance have particularly high past profitability.[14] This does not mean that the stock market is not doing its job properly; one of the important functions of the market is to provide finance to companies with good future prospects but poor current profits which are inadequate for the generation of internal finance. However, it does mean, in the present context, that there is potentially an important downward bias in BHMQ's estimate of the profitability of retention finance. This bias arises because high profitability will tend to be associated with a high proportion of retention finance and with lower future profitability, but the high retentions do not necessarily *cause* the lower future profitability.

Our analysis was not subject to this bias and, in its earlier forms (equations (4) and (5)) suggested that external financing has a trivial effect on future profitability. The apparent effect of external financing on future profitability only became really important (equations (6), (7) and (9)) when past growth was added to the explanatory equation. Growth appears to have a negative independent influence on future profitability [15] and it is positively correlated with external financing. Thus, when growth is omitted from the explanatory equation (as in equations (1), (2), (4) and (5)) the apparent influence of external financing on future profitability is biased downwards. It therefore seems reasonable to introduce past growth into the explanatory equation (as in equations (6), (7) and (9)). What we are doing then is removing the linear influence of growth on future profitability and estimating the independent effect of external financing on future profitability, as between firms having equal past profitability and growth.

[12] This is discussed at greater length by Whittington (1971), chapters 4 and 5.
[13] See, for example, Singh and Whittington (1968), chapter 3.
[14] See Whittington (1971), table 5.9.
[15] It will be recalled that this was attributed earlier to the fact that firms which grow rapidly are more likely to invest up to, or beyond, the margin of profitability.

On the other hand, it could be argued that the method of financing is not separable from the effects of the growth which it makes possible; if external finance is typically used to finance growth which lowers average profitability then it is used relatively unprofitably, even if it is not as unprofitable as the rarer event of a similar growth rate being financed internally. This is the philosophy of the BHMQ study, which does not make any allowance for the independent influence of growth on future profitability.[16] If such an allowance *were* made, then the profitability of external finance relative to that of internal finance might be increased. This downward bias (if it can be regarded as a bias) in BHMQ's estimate of the relative profitability of external financing may offset the upward bias described earlier. This may explain why the BHMQ estimates can be made to appear to be remarkably consistent with ours.

This appearance of consistency can be obtained by following BHMQ, ignoring our earlier conclusions, and attributing the difference in future profitability of externally financed firms solely to the new external finance raised. The average increase in net assets between 1948–1954 and 1954–1960 was roughly 50 per cent, i.e., roughly one third of net assets in 1954–1960 would represent capital raised in the preceding six years. Of this it is reasonable to assume that, amongst the externally financed firms, less than one half of the new capital would be raised externally.[17] Thus, we are attributing the above-average profitability of externally financed firms in 1954–1960 to the greater profitability to be 1.4 percentage points (as in equation (7)) and attribute this solely to external finance, this means that the excess return on external finance was (roughly) 8.4 percentage points (i.e., 6× 1.4 percentage points). This is consistent with the order of magnitude of the differential rates of return on external finance estimated by BHMQ, particularly when it is remembered that our estimate does not separate external finance into debt and equity (which BHMQ found to give a higher yield than debt). However, for the reasons advanced earlier, this consistency is merely superficial.

VI Conclusion

Our results for the United Kingdom, like those of BHMQ for the United States, suggest that the discipline of the stock market does appear to have some effect in improving the profitability of the firm.

The question which is left open by our analysis is the extent of this effect. We have reason to believe that the extent of the effect does not depend upon the amount of new finance raised and that BHMQ's estimates of the differential rate of return on equity financing may therefore give a misleading impression. The policy prescription derivable from this *result* is that the profitability of firms might be improved if more firms had

[16] This is, of course, consistent with the BHMQ assumptions, implicit in BHMQ (1971), figure 1, that all firms invest up to the margin of profitability. In this case, those firms with the more profitable opportunities will invest most, and the rate of return on incremental investment, with which BHMQ are concerned, may, as they suggest, be actually higher amongst those firms which expand most.

[17] See Singh and Whittington (1968), table 2.8.a.

resort to the capital market, but not if the firms which already have resort to the market raised larger amounts.[18]

We have also questioned BHMQ's quantitative estimates because of their implicit assumption that the profitability of existing capital will remain constant in the future. This probably leads them to underestimate the profitability of internal financing.

Finally, our own estimates of the favourable effect of external financing on future profitability depend to an important extent on separating the effects of growth (measured in terms of net assets) from the effects of the method of finance used. The BHMQ analysis did not make such a distinction.

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[18] There is a certain ambiguity here because, as stated earlier, the market may not *affect* the future profitability of firms; it may merely *select* the firms with the best prospects. In this case, encouraging more firms to go to the market would not have any effect on future profitability.

DIRECTORS' PAY, GROWTH AND PROFITABILITY

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THE last 15 years have witnessed a series of theoretical works that have sought to replace the traditional motive of company directors, maximization of profit, with the maximization of some form of growth.[1] In support of this new maximand, several writers maintain that increases in size present overwhelmingly greater material incentives to directors than do increases in profitability. Several analysts have reviewed the evidence for this contention, using correlation or regression techniques to estimate the respective influence of size and profitability on pay. Studies before 1970 obtained results that were surprisingly decisive by the standards of applied economics, and reported in favour of the 'managerial theorists" arguments with remarkable unanimity.[2] The relation between size and pay was found to be positive and passed the usual statistical significance tests with flying colours, whereas that between profitability and pay earned only scorn: the estimated coefficient was not significantly different from zero even at the permissive 5% level.

In 1970 the harmony was disturbed by Lewellen and Huntsman [4], who declared, on the basis of new estimates, that '…reported profits are substantially more important in the determination of executive compensation than are sales—indeed sales seem to be quite

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[1] For example, Baumol [2], Penrose [11], Marris [9], Marris and Wood [10], etc.

[2] Roberts [12] concludes that the 'relationship (of executive compensation) to the level of profit is superficial and disappears when the influence of size upon both compensation and profit is taken into account'. Marris [9] concurred with Roberts in holding that 'profitability had no apparent effect on salaries'. And McGuire, Chiu and Elbing [8] found 'that sales and executive compensation are significantly correlated in five of the seven cases given; while profits and executive compensation are not significantly correlated'.

irrelevant…'[3] This paper, using hitherto unavailable data for a very large sample of U.K. companies,[4] reconciles these apparently conflicting statistical results; and, in interpreting them, rejects both extreme positions.

I. THE MODEL

The managerial theorists contend firstly that, above a certain growth rate, increases in a company's growth rate are possible only at the expense of the profit rate; and that market forces leave directors some discretion in their choice of growth/profitability combination.[5] This opens the way for a conflict between the interests of directors and those of shareholders (if the latter are served only by profit maximization). Secondly, these theorists allege that, in decisions on directors' pay, a far higher premium is placed on growth than on profitability. This means that the salary system, far from resolving the conflict of interest by bribing directors to pursue shareholders' objectives, will instead induce directors to trade profitability for growth.

The claim that pay is more dependent on growth than on profitability has been investigated here by estimating for cross-section data the model:

$$\text{directors' pay} = a + b.\log \text{size} + c.\ \text{rate of return} \qquad (1)$$

Underlying the model is the assumption that, over the whole range of sizes and profit rates, any constant *absolute* difference in profitability will be associated with a constant *absolute* difference in directors' pay; and, over the whole range of sizes, *any proportionate* difference in size will be associated with a constant *absolute* difference in directors' pay. This formulation of the relationship between size and directors' pay is that which is most consistent with the view that directors are likely to be paid according to the

If the cross-section relationship (1) represents the payment rates applicable to the average firm, the estimated slope coefficients can be used to infer the relative rewards directors might expect from alternative policies with various growth and profitability implications, although as we shall demonstrate, the process of inference involves important simplifying assumptions.

[3] In one respect, Lewellen and Huntsman's paper could boast superiority over both the earlier work (see footnote 2) and this study; data were available for forms of income other than the salary, fees and bonuses relied upon here (for instance for stock options which are often thought to be more sensitive to profitability). In the light of Lewellen and Huntsman's findings, neglect of these other components would not, however, seem to restrict conclusions based on the limited measure: typically, the broader definition of income proved to be no better explained by profitability than the narrow variant.

[4] Only since the 1967 Companies Act have U.K. companies been required to disclose information about individual directors' pay; such data were only accessible to us for all companies from 1969.

[5] This formulation follows Marris [9] in particular.

proportionate growth rather than the absolute growth of their firms: thus £100,000 of extra size will add more to the pay of the directors of a £1 million firm than to that of the directors of a £10 million firm.[6]

II. THE ESTIMATED RELATIONSHIPS

The model was estimated for the years 1969, 1970 and 1971 using a variety of pay and size measures. However, at this stage the results of only one variant, common in the literature, are reported: pay is defined as that of the highest paid director, sales are used as the size measure, and the current year's rate of return is employed. The results for other variants of the model referred to in Appendix III, do not prompt a radically different conclusion from that reported here, and the choice of the specific model shown in the text does not yield conclusions specially favourable to our interpretation.

At first sight the results presented in Table I might seem roughly to confirm the standard conclusions.[7] In terms of both statistical and economic significance, size appears to trump profitability. The reliability of *b* (as reflected in its t value) is much greater than that of *c*. In economic terms, the model predicts that a shift from the average to the top 5% of the respective distributions[8] would, in 1969, have increased salary by approximately £10,000 p.a. in the case of size, as against only approximately £2000 p.a. for profitability. Consequently, the conclusion of Roberts [12] [13], echoed by Marris [9] and by McGuire, Chiu and Elbing [8], that, compared with size, profitability has little or no effect on salaries, might not seem to call for drastic revision: profitability could be promoted to a somewhat more important minor part, but with size retaining the lead role.

One step implicit in the managerial theorists' case here, however, is a dubious one. They evidently argue that since the premium on size outweighs that on profitability, so the premium on changes in size, that is growth, will be paramount. This move can be challenged because, although the range of experience represented in the cross-section observations may be attainable by the individual firm in the case of profitability, it surely is not in the case of size. While very swift progress from the lower to the upper tail of the profitability distribution (and vice versa) is not uncommon (see Whittington [17], p. 86), a comparable drastic shift within the size distribution in the space of a few years is most unlikely. To make the transition from smallest to largest of those companies used in this

[6] This form of relationship is plausible in view of the shape of the frequency distributions for the different variables: the size distributions are strongly positively skewed, while only a slight positive skewness is exhibited by pay or profitability.

[7] Roberts [12] [13] and McGuire, Chiu and Elbing [8] used correlation analysis, and the rough similarity of our results to theirs is confirmed by the simple correlations referred to in Appendix III.

[8] Taken as the mean of the variable plus two standard deviations, on the assumption that the distribution of the variable is normal.

TABLE I

THE REGRESSION OF DIRECTORS' PAY ON LOG SIZE AND PROFITABILITY

	Constant term	*Regression coefficients*		
Year	*a*	*b*	*c*	R^2
j=1969	−23896	3820	97	0.345
	(−14.6)	(22.8)	(5.1)	
j=1970	−23698	3872	68	0.375
	(−15.3)	(24.5)	(3.9)	
j=1971	–24025	4002	46	0.395
	(−15.6)	(25.6)	(2.8)	

$D_{ij}=a+b.\log S_{ij}+c.R_{ij}+e_{ij}$

D_{ij}=salary, including bonuses, of highest paid director (£) for the ith company for year *j*.

S=sales (£000)

R=rate of return (%)

e=stochastic error term

Source: Published accounts of 1008 major U.K. quoted companies which continued in existence from 1967 to 1971 (see Appendix for further details). Note: The *t* value of each coefficient is reported in brackets under that coefficient. All the coefficients are significantly different from zero at the 1% level. The constant term is expressed in £*s* of directors' pay and the other coefficients in £s pay per unit change in the relevant variable. In 1969, for example, a unit difference in the natural log of size was associated with a difference of £3820 in pay, while a difference of one percentage point in the rate of return was associated with a difference of £97 in pay.

Certain extreme values were omitted before estimating this and subsequent models.

study would imply a 750-fold increase in size; and since actual annual growth rates much above 20% are unusual,[9] such a change would typically take many years. Accordingly, the exercise carried out above which purports to evaluate the impact on salary of the two explanatory variables, by comparing 'equivalent' shifts within their distributions, produces misleading results.

The relevant exercise, for inferring the consequences of changes through time from the static model and comparing the incentive to grow with that for raising profitability, would instead confine predictions of pay increases to those associated with the feasible growth and profitability achievements of the individual firm.[10] Table II has been prepared on this basis, focusing on the range of growth rates actually experienced over time, rather than

[9] Singh and Whittington [16] document extensively the actual growth rates achieved by U.K.. companies. Constraints on the growth of firms are imposed both by internal difficulties (see especially Penrose on the problems of expanding the management team), and by factors external to the firm, such as the growth of a company's market or the national economy (on the latter, see Rowthorn [14]).

[10] Better still for this purpose, the relationships would be estimated directly from observations of actual changes through time. This has been attempted (see below), but the 'static' results have still been afforded pride of place firstly because the time period for the dynamic exercise is necessarily so short, and secondly so that the results may be directly reconciled with earlier work which has concentrated on static relationships.

on the arbitrary dispersion of size observations at a single point in time. It draws on the regression slopes reported in Table I to present the additional pay the director might be expected to receive for raising the growth rate or profitability from the mediocre to the outstanding, that is by increasing either performance measure from its respective mean to two standard deviations above the mean. In the case of profitability, this calculation merely involves the application of the estimated coefficient *c* to the relevant change in profitability. In the case of growth, the calculation is almost as simple because the logarithm of the growth multiple ([1+*g*], where *g* is proportionate growth) is the change in the logarithm of size: the logarithm of the relevant growth multiple is therefore applied to the estimated coefficient *b*.[11]

In view of the established interpretation, the results shown in Table II are quite startling: the profitability premium exceeds that for growth in two of the three years, while in the third, the benefits for profitability are not drastically less than those for growth.[12]

TABLE II

THE PREMIUM ON GROWTH AND PROFITABILITY

		Performance variable	
Year	*Achievement*	*Growth of sales*	*Profitability*
1969	A	344	1484
	B	1413	2406
1970	A	348	1040
	B	1433	1687
1971	A	360	704
	B	1481	1141

A: Additional payment to the highest paid director for raising the performance variable from zero to its mean (£).

B: Additional payment to the highest paid director for raising the performance variable from its mean to two standard deviations above its mean (£).

Source: Derived from the regression estimates reported in Table I by the method described in the text.

[11] The average and standard deviation of annual growth rates are those of U.K. quoted companies for the period 1964–69 which are available from another study. For consistency, the profit rate statistics are taken from the same group, though in fact they are very similar to those for the sample used in the regressions.

As these growth estimates include the contribution of inflation to nominal growth, whilst the static cross-section estimates are necessarily in constant prices, they over-estimate the feasible real growth of companies, and hence cause the premiums on growth in Table II to be inflated.

[12] It might be objected that a director's salary boost for moving to a much bigger company would still far exceed that for attaining the maximum possible profitability in his present firm. However, though this might be a significant factor in explaining directors' personal strategies, it is irrelevant to the question of how motivation impinges on the company's policy: someone has to choose for the company between different profitability and growth combinations, and the possibility of changing to a company of vastly bigger size, though perhaps available to its directors, is not open to the company. In fact, executive mobility has been found to be low (see Roberts [12] [13]): it may well not loom large in directors' personal strategies.

Of course, all that these calculations assess is the economic significance of the regression coefficients. By contrast, earlier analysts have relied heavily on the relative statistical reliability of their estimates in discriminating between the potential influences on directors' pay, and finding in favour of growth. It is certain, however, that the regression of pay on *growth*, by restricting attention to the zone of observations adjacent to an individual firm's position in the *size* distribution and attainable by that firm would diminish the relative reliability of the growth coefficient, *b* (as reflected in its *t* value), compared to that which is obtained by regressing pay on size.[13]

pay=a+b.log size

were estimated for two samples, the first being that on which our regressions have been performed, and the second similar in all respects except that the range of the regressor size was drastically reduced. Thus, given:

$$t_b = \frac{\hat{b}\sqrt{\Sigma x_i^2}}{V}$$

b (the estimated regression coefficient), V^2 (the residual variance) and the size of the sample are common to both samples. The range of x_i (size of the ith company minus mean size) is the only difference. Necessarily, the sample with the restricted range of sizes (smaller $\sqrt{\Sigma x_i^2}$) has the lower value for t_b. See Wonnacott and Wonnacott [19], p. 23, for a fuller argument.

The extent of this effect is uncertain, and there are further consequences of the transition from the use of size to the use of growth as a regressor which are discussed below. It is therefore misleading to rely on the relative statistical reliability of the estimates of the effect of size on pay in drawing inferences for the effects of growth.

III. THE 'DYNAMIC' EXTENSION

The question of how pay is affected by *growth* can be investigated more directly by estimating (again in cross-section) a model complementary to model 1 above:

Δ directors' pay=a+b.Δ log size+c.Δ rate of return (2)

It is surprising that previous studies have all preferred to infer the effects of growth from those of size, rather than attempting direct estimation.

[13] Suppose, for the sake of argument, that the model,

Table III presents the results of estimating model (2) where the changes are those recorded between 1969 and 1971 in the particular variables used for Table I.[14] The new results confirm our reservations about the inferences for the effects of growth which can be drawn from model 1. The movement of pay with profitability through time (reflected in *c*) is consistent with the relation across firms observed for the static model; yet that of pay with changes in size (reflected in *b*) is much reduced in comparison with model 1.

Again, the economic significance of the two slope coefficients is illustrated by comparing the predicted rewards for outstanding as opposed to mediocre growth or profitability performance: the comparison is presented in Table IV, the counterpart of the 'static' Table II. It can be seen that the previous conclusions are reinforced: considering comparable achievements in terms of growth or profitability within the period, the premium on profitability is indeed at least as great as that for growth—in this dynamic case it is in fact almost four times greater. Moreover, the relatively superior statistical reliability of *b* observed for the static case disappears when the changes in size are automatically constrained, in the dynamic case, to those actually attained by companies.[15]

Though, in terms of both economic and statistical significance, the dynamic results appear to support the interpretation given for the static model, too precise a construction should not be placed on the comparisons of estimates obtained for models 1 and 2: the link between the two is not without difficulties. Model 2 was designed as an analogue of model 1, obtained simply by subtracting the static equation for each company at the beginning of a period why the size or reliability of the estimated coefficients in the static and dynamic cases may not correspond precisely:

(i) Even if the underlying real relationship is constant, the coefficients relating the nominal values of the variables will change with inflation (see Appendix IV): so *a*, *b* and *c* may differ in the static equations at times $j-1$ and j.

There are, however, three reasons in addition to that discussed earlier[16]

(ii) It seems likely that, in so far as the error term represents the relative generosity of the pay policy of the individual firm, e_{ij} will be positively correlated with e_{ij-1}, since there is no reason to expect that companies which initially pay above or below the norm described by the regression will cease to do so.[17] This would mean a lower residual

[14] So that the regression estimates were more directly comparable with the static version 1, despite the high rate of inflation at this time, A directors' pay was expressed in constant prices (see the general discussion of the impact of inflation in Appendix IV). Again, variants of the model with different measures of pay and size were estimated (see Appendix III).

[15] As predicted in the discussion above of the influence of the regressor's range on the coefficient's t value.

[16] See the final paragraph of section II, and footnote 13.

[17] This problem could be dealt with by estimating an error component version of model (1) from pooled cross-section and time series data. Such a model might explicitly recognize that the error term has several components, e.g. (1) a 'time' component, (2) a component unique to each individual firm, and (3) a component unique to the individual industry (see footnote 27). The estimation of such a model from our present data would, however, pose a considerable computing task. Moreover, it would require an assumption that the population slope coefficients do not change from year to year—an assumption which is likely to be violated under inflation. Some adjustment of the data to allow for inflation would certainly be necessary (see Appendix IVa). Error component problems are discussed in the context of similar data by Kuh [3], Chapters 4 and 6. A rigorous discussion of the theoretical problem will be found in Balestra and Nerlove [1].

variance for the dynamic than for the static model, with correspondingly higher *t* values for all the individual coefficients.

TABLE III

THE REGRESSION OF CHANGE IN DIRECTORS' PAY ON LOG GROWTH AND CHANGE IN RATE OF RETURN

Constant term	*Regression coefficients*		
a	*b*	*c*	R^2
−626	1601	108	0.09
(−3.6)	(3.0	(8.7)	

$\Delta D_{ij}=a+b.\Delta\log S_{ij}+ c.\Delta R_{ij}+e_{ij}$
i=*i*th company.
j=the period 1969 to 1971 (differences, Δ, are 1971 flows, less 1969 flows)
R=rate of return (%)
D=salary of highest paid director in 1971 prices (£)
S=sales (£000)
e=stochastic error term
Source: As in Table I.
The *t* value of each coefficient is reported in brackets under that coefficient. All the coefficients are significantly different from zero at the 1% level. A unit change in the natural log of size was associated with a rise of £1601 in pay, while a rise of one percentage point in the rate of return was associated with an increase of £108 in pay.

TABLE IV

THE PREMIUM ON GROWTH AND PROFITABILITY

		Performance variable	
Period	*Achievement*	*Growth of sales*	*Profitability*
1969–71	A	144	1652
	B	592	2679

A: Additional payment (£) for raising the performance variable from zero to its mean.
B: Additional payment (£) for raising the performance variable from its mean to two standard deviations above its mean.
Source: Derived from the regression estimates reported in Table III.

from that at the end of the period:

$D_{ij}=a+b.\log S_{ij}+c.R_{ij}+e_{ij}$
minus $D_{ij}-1=a+b.\log S_{ij-1}+c.R_{ij-1}+e_{ij-1}$

gives the dynamic equation:

$$D_{ij}-D_{ij-1}=(a-a)+b.(\log S_{ij}-\log S_{ij-1}) +c.(R_{ij}-R_{ij-1})+(e_{ij}-e_{ij-1})$$

(iii) There is a strong theoretical argument for expecting the observed values of *b* and *c* to change over time, and to differ for dynamic and static regressions, even in a regime of constant prices. Analogously with the movement of consumption or dividend distributions[18] in permanent income theories, pay may well adjust to size and profitability changes only with a lag. And indeed, as this argument suggests, average profitability for the three years ending in year *j* does explain pay in year *j* better than does profitability in year *j* alone. Accordingly, even if the underlying 'ideal' relationship were constant, the relationships observed at particular times (or over any period) might represent various stages of (or movements in) an unfulfilled adjustment process, and, simply because of lags, might differ both from the ideal and among themselves.

In summary, for all these reasons, even with a constant structural relationship, estimates of essentially the same model at different times and through time may differ considerably.

IV. THE LEWELLEN AND HUNTSMAN RESTORATION OF PROFITABILITY

Lewellen and Huntsman propose initially a model similar to that adopted above to discriminate between the influence of profits and sales on pay. As a starting-point for their argument they propose the specification:

$$D_{ij}=a+b.S_{ij}+c.P_{ij}+e_{ij} \qquad (3)$$

where *S* is sales, *P* is profits, and the other variables are as defined above. Noting, however, that this specification poses the statistical problems of multicollinearity

[18] See Lintner [7] in particular.

(avoided in our formulation by the use of the rate of return in place of total profits, which removes the 'size of firm' element from profitability) and heteroscedasticity,[19] they attempt to sidestep these difficulties by employing an amended specification:

$$\frac{D_{ij}}{A_{ij}} = \frac{a}{A_{ij}} + b \cdot \frac{S_{ij}}{A_{ij}} + c \cdot \frac{P_{ij}}{A_{ij}} + \frac{e_{ij}}{A_{ij}} \qquad (4)$$

where A is assets and P/A is the rate of return, R. It is this stage of their work which prompts the 'reversal' of earlier conclusions; but its economic rationale is open to question: model 4 actually eliminates the influence of size (represented by assets) on pay, the main concern of earlier work, asking only what is the influence of the profit rate and the sales-asset ratio on directors' pay. This is quite different from the question posed by earlier writers: and it is not surprising, therefore, that Lewellen and Huntsman arrive at an apparently different conclusion from that of earlier writers.

Size (as represented by assets) is absent from equation (4), but might be reinstated by inserting a constant term (since $A_{ij}/A_{ij}=1$). Lewellen and Huntsman report that they suppressed the constant term because, when it was present, it was not statistically significant. However, lack of statistical significance does not necessarily imply lack of quantitative importance. Furthermore, if our specification (equation (1) above) is correct, there is a curvilinear (logarithmic) relationship between size and pay: this relationship might not be adequately tested by fitting the linear approximation embodied in the constant term ($\log A_{ij}/A_{ij}$ being the correct specification).[20]

To illustrate this objection, and the fact that the conclusions both of earlier writers and of Lewellen and Huntsman may be derived from the same data, an extension of model 1 above has been estimated:

$$D_{ij} = a + b \cdot \log A_{ij} + c \cdot R_{ij} + d \cdot \frac{S_{ij}}{A_{ij}} + e_{ij} \qquad (5)$$

For comparability with Lewellen and Huntsman's model this formulation discriminates between the profit rate and sales-asset ratio as explanations of pay; but, in addition, it yields an estimate of the impact on pay of assets. The regression results, presented in Table V, echo and counterpose the figures of both sides in the debate. True, as Lewellen and Huntsman argue, the influence of the sales-asset ratio is very weak compared with that of profitability. As the table shows, in one year of the three reported, d was not

[19] Heteroscedasticity is not a serious problem in large sample studies, since its effect is to reduce the efficiency of the estimates rather than imparting a bias: we do not therefore consider it to be a serious drawback of our own analysis. Our estimates, despite heteroscedasticity, are still unbiased and consistent, and we have more than 1000 observations, so that the lack of efficiency of our estimates is not serious.

[20] This criticism of Lewellen and Huntsman is made by Yarrow [20], p. 159.

TABLE V

THE INFLUENCE ON PAY OF SIZE, PROFITABILITY AND SALES INTENSITY

	Constant term	*Regression coefficients*			
Year	*a*	*b*	*c*	*d*	R^2
j=1969	−25771	4233	127	101	0.40
	(−16.6)	(25.9)	(6.8)	(1.0)	
j=1970	−24755	4218	79	224	0.42
	(−16.8)	(27.0)	(4.7)	(2.3)	
j=1971	−24891	4295	57	375	0.43
	(−16.8)	(27.5)	(3.5)	(3.6)	

$$D_{ij}=a+b.\log A_{ij}+c.R_{ij}+d.\frac{S_{ij}}{A_{ij}}+e_{ij}$$

D_{ij}=pay of highest paid director (£) for the ith company for year *j*
A=total assets (£000)
R=rate of return (%)
S=total sales (£000)
e=stochastic error term
Source: As Table I.
All the coefficients except *d* in 1969 are significantly different from zero at the 1% level. The constant term is expressed in £s of directors' pay, and the other coefficients in £s of pay per unit change in the relevant variable. In 1969, for example, a unit difference in the natural log of size was associated with a difference of £4233 in pay; a difference of one percentage point in the rate of return with a difference of £127 in pay; a difference of one in the sales-assets ratio with a difference of £101 in pay.

significantly different from zero at the 1% level,[21] and in another year barely so; whilst, in 1969, moving from the mean to two standard deviations above the mean of the sales-asset ratio implies an increase in pay of only £400. As against this, in line with the results of earlier writers, the economic and statistical significance of size is decisively reaffirmed. This fact, crucial for the managerial theories, is thus compatible with the estimates of Lewellen and Huntsman, despite their claims to the contrary.

V. THE RESULTS IN PERSPECTIVE

Notwithstanding the exercise performed by Lewellen and Huntsman, size is confirmed as being of overwhelming importance in the explanation of the level of directors' pay. However, the usual inference of earlier writers, that the pay incentive offered for growth will outstrip that for profitability, has been qualified: when just the consequences of the limited range of policies open to the firm in any one year are considered, it emerges that growth pays no better than profitability.

[21] The 1% level is used, rather than the more common and less stringent 5% level, because our large number of observations means that the chance of a point estimate being accepted is greater (the standard error being lower) than in the smaller samples which are typically used.

However, even this conclusion has to be set in perspective. Though the comparison of increases in growth and increases in profitability in Tables II and IV is appropriate to the managerial theories of motivation, there remains an asymmetry between the growth and profitability premiums reported.

For while the profitability payment is received in subsequent years only so long as that element of performance is maintained, the influence of growth on pay has a cumulative or 'ratchet' effect: on just the weak assumption that the current year's closing size is maintained (that is, even allowing a zero growth rate in subsequent years), the growth premium is paid not just in the year in which any growth is achieved, but for ever after. Consequently, the relative importance of the pay-off for growth or profitability hinges on the director's time horizon; the stream of benefits arising from additional growth in the current year may yet far outweigh the immediate 'opportunity cost' in terms of profitability forgone.

Nevertheless, it may still be contended that the influence of profitability on the average level of directors' pay is non-trivial either in itself,[22] or in relation to the corresponding influence of growth, in rebuttal of the claim in earlier studies that 'profitability had no apparent effect on salaries'.[23] [24]

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[22] The predicted reward for shifting from average profitability to two standard deviations above average was, in 1969, 18.2% of the average pay of highest paid directors; for shifting from zero profitability to two standard deviations above average it was 29.5% of the average.

[23] Marris [9], p. 84.

[24] Of course, these conclusions relate to only one of several elements in managerial reward. Lewellen [5] [6] has argued that other components of directors' income, notably stock options and income from shareholdings, increase their concern to maximize those variables such as profitability, dividends and share price which are of interest to shareholders. The Lewellen and Huntsman results did not suggest that the substitution of managerial compensation for salary payments in our analysis would have led to different conclusions as to the relative rewards of profitability and growth. However, we have no direct evidence as to how our results would be affected by the inclusion of ownership income, as defined in Lewellen's later work [6]. Again, the consequences of different policies for directors' security of tenure may seriously impinge on their action, though the implications for the growth-profitability trade off are not unambiguous. The threat to tenure could come directly from profit-oriented shareholders; as against this, both stability of performance (documented by Singh and Whittington [16] and Whittington [17]) and immunity to take-over (documented by Singh [15] and Whittington [18]) increase with size, and might be expected to prompt a preference for growth. Finally, a host of less tangible pressures and incentives influence directors: these are considered at length in Marris [9]. It should be noted that these factors will not all favour increased size: for instance, greater size can bring with it greater responsibility.

APPENDIX

I. THE DATA

The data used in this study are the published accounts of quoted companies operating primarily in manufacturing and distribution within the United Kingdom. The accounts were collected and written in standardized form to magnetic tape by the Statistics Division of the Department of Trade and Industry (S.D.D.T.I.). The data are a continuation of the series used in Singh and Whittington [16] and Whittington [17] except that certain smaller companies are excluded for the period of the study.[25] The data and the weaknesses inherent in the conventional (modified historic cost) form of financial accounting, on which they are based, are discussed in these publications.

II. THE VARIABLES

a. *Directors' Salaries*

Two limitations are imposed by the availability of data. Firstly, only directors' pay, and not that of other senior managers is considered. Secondly, our measures include only payments in the form of salaries, fees and bonuses, and not stock options or benefits from the ownership of shares. Two measures of salary have been used in the tests. On the one hand, that of the highest paid director typically represents the highest to which any employee of the company can aspire; and it has been used in the earlier work of both Roberts [12] [13] and McGuire, Chiu and Elbing [8]. On the other hand, the average salary of directors' summarizes the rewards of the top management group. However, as payments to part-time directors are included in this average, difficulties arise in comparing the payment level of companies with different proportions of part-time directors.[26]

[25] Those with net assets below £2 million or gross profits below £200,000 in 1968.

[26] A third available measure, the chairman's salary, was not included, because acute difficulties arise in comparing companies where the chairman is the chief executive with those where he is only a part-time employee. Commonly, where the chairman is also chief executive, he will also be the highest paid director.

b. *Size*

Results using three size measures were estimated. The capital measure, total assets at net book value, is sensitive to the vagaries of accounting measurement. The sales measure is relatively free of these measurement problems, though it may exaggerate the importance of firms in certain industries, such as wholesale distribution, which have an unusually high ratio of sales to either assets or value added.[27] The third measure, value added, has its attractions as a measure of the company's contribution to National Income. However, we face limitations in attempting to approximate a true measure of value added by adding total wages to total profits since U.K. companies are only required to disclose payments to U.K. employees.

Since none of the size measures is clearly optimal, results using all three were estimated. The results using sales are reported in the text since they occupy pride of place in the literature.[28]

c. *Profitability*

Our measure of pre-tax profitability shows the rate of return on the long-term capital in the business. It too is subject to the limitations of accounting measurement.[29]

III. VARIANTS OF THE MAIN RESULTS

Tables presenting the results of the exercises reported in Tables I to IV, but carried out using alternative measures of pay and size are available from the authors. Additional tables give the mean, standard deviation and skewness moment for each variable and simple correlation coefficients for each pair of variables.

[27] If pay is also independently influenced by industry, then, when sales are used as the size measure, correlation between sales and industry might cause the industry influence to be wrongly attributed to size. Even in the absence of such a correlation, our model will have excluded an important explanatory variable if pay is systematically related to industry (see footnote 17). Industry differences in pay have not been examined here. Yarrow's [20] work suggests that this may be an important omission.

[28] A fourth size measure, profits, is available. But as our purpose has been to discriminate between the influence of size and profitability, using a measure which combines both elements could lead to confusion.

[29] A fuller definition and discussion of this variable is presented in Singh and Whittington [16].

IV. THE IMPACT OF INFLATION ON THE REGRESSION ESTIMATES

a. *The Static Model*

Suppose that in two successive years the real values of pay, size and profitability are unchanged, but inflation of *x*% takes place in the interval. Assume that the recorded value of profitability is unchanged, with both numerator and denominator increasing by the same proportion, while pay and size both increase by *x*%. Then, in model 1, the coefficient relating pay to size will be higher in the second year, and the intercept lower.[30] This is because the inflationary increase in log size would be uniform for all opening sizes, whilst the inflationary increase in pay would be positively related to opening size (being a proportion of opening pay which is itself positively associated with size). This prediction is borne out by the successively larger coefficients relating pay to sales and to value added.[31]

b. *The Dynamic Model*

Similarly, in estimating model 2 for two situations, one a regime of rising and the other of constant prices, but both featuring the same real changes for each company, comparable conclusions emerge. For the 'inflated' data, the constant term will be not zero but positive by an amount which expresses the average inflation increment of a director whose company's real size and performance do not change. In addition, the slope coefficients, *b* and *c*, will be greater. This reflects the fact that any real increment earned by virtue of increased size or profitability will be inflated by a uniform percentage. Finally, the dispersion of individual observations about the average relationship will again be greater. Accordingly, for model 2, the change in directors' pay has been expressed in constant prices for comparability with the constant price static model 1.[32] The change in log size is not adjusted for inflation, since a uniform rate of inflation across all firms will imply that

[30] Moreover, the dispersion of individual observations about the average will be greater. For any combination of size and profitability there may be a number of companies each with different levels of directors' pay. On the assumption of uniform proportionate pay increases the divergence between above and below average payments will be greater after inflation.

[31] Though this is not so for assets, whose value changes less predictably with inflation because of accounting conventions. This suggests that inflation may also distort the profit rate; see footnote 33.

[32] It is assumed that companies do not suffer from money illusion and adjust real pay in response to real changes in the explanatory variables.

the change in log size is increased by a uniform amount for all firms. In consequence, the slope coefficient, *b*, will be free of the effects of inflation, but the constant term will be lower than in a constant price system. If the numerator and denominator of profitability are inflated in equal proportions, the change in profitability will be unaffected by inflation.[33]

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[33] This assumption may be unreasonable since denominator and numerator are affected differently by inflation. On the one hand, fixed assets are valued at inflated current prices only when they are replaced or (occasionally) revalued; on the other hand, profits are inflated by the inclusion of stock appreciation and the charging of depreciation on a (relatively low) historic cost basis.

Section II
Specification of empirical models

A COMMENT ON THE EFFICIENT MARKETS INTERPRETATION OF A RELATIVE DECLINE MODEL

GEOFFREY WHITTINGTON*

The paper by Peasnell and Skerratt (PS) (4) provides an interesting discussion of several aspects of the recent paper by Jones, Tweedie and Whittington (2)[1]. Some of their points are extensions or amplifications of points made implicitly or explicitly in the original paper and are not controversial. The purpose of this note is to deal with their central point: the efficient markets interpretation of the empirical results, and the reasons why this interpretation was ignored in the original paper. There are three main reasons for this.

Firstly, as PS concede, the Efficient Markets Hypothesis (EMH) is strictly untestable, since it holds that *no* model can beat the market. In the semi-strong form favoured by PS, this means that no model using publicly available information can beat the market. Since there is an infinite number of possible models (bearing in mind the large number of possible explanatory variables, the even larger number of possible combinations of these, and the endless subtleties possible in specifying the functional form of their effects), testing the effectiveness of one, rather simple, model can hardly be regarded as "*a fairly stringent test* of the semi-strong version of the EMH" (PS, my emphasis). A practical analogy would be a race in which one contestant (the Relative Decline Model) withdrew, from a very large field. This would not normally be regarded as being "fairly stringent" evidence that a specific member of the surviving field (the EMH) would win.[2]

Secondly, the classical statistical methods of hypothesis testing used in our paper are not symmetrical as between the alternative hypothesis (H1) and the null hypothesis (H_o), which is usually the hypothesis that the value of the variable or parameter under observation is really zero. The tests are, in fact, heavily weighted towards rejecting the alternative hypothesis (non-zero value, H1), because the so-called "level of significance" is usually stringent. A 5 per cent level of significance, as used in our paper, implies that we regard the observed parameter value as "not significantly different from zero" (where H_o is that the value is zero) if there is a greater than 5 per cent (1 in 20) chance that the true value is zero. This places very heavy emphasis on minimising the probability of committing the so-called "Type 1 error": rejecting the null hypothesis (H_o) when it is true. Obviously, the more we try to minimise Type 1 error the more likely we are to increase the probability of "Type 2 error": rejecting the alternative hypothesis when it is true,[3] (or, strictly, the possibility of accepting Ho when it is false).

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In the context of the Regression Portfolio, the alternative hypothesis (H_1) was that the regression coefficients of the model were significantly different from zero, i.e. H_o was that the coefficients would have the zero value implied by the EMH. Thus, using the conventional 5 per cent significance level, we were weighting our test against the acceptance of the hypothesis, H_1. This is emphatically *not* evidence that we should positively accept the null hypothesis, H_o, i.e. the failure of H1 to pass our stringent significance test means merely that we cannot reject H_o, not that we should accept it. If the EMH were subject to a similarly stringent test (i.e. if it were to become the alternative hypothesis) in competition with a new null hypothesis (e.g. that each of the Regression Portfolio coefficients had the lowest value which was considered a quantitatively important diversion from the EMH) it would probably fail the test, given the observed values of the standard errors. The 5 per cent confidence interval about a regression coefficient is ±1.96 times its standard error, and this contains all the null hypotheses which would not be rejected at the 5 per cent significant level. Since our standard errors are large, the confidence intervals are wide, and so is the range of acceptable null hypotheses, market efficiency being only one of many possibilities.

It should be emphasised (as in our original paper) that the limited number of observations in our example, and the crudity of our model (e.g. the arbitrary five-year period chosen) inevitably increase the standard errors of our estimates relative to what would be expected from a more extensive and sophisticated study. This reinforces the stringency of the significance test and, in these circumstances, it is important to note that several of the regression Portfolio coefficients relating to future income performance did pass the significance test (see particularly Table 3 of our original paper) in competition with the null (EMH) hypothesis.

Thus, it is possible to agree with PS's judgment on the stringency of significance testing: "scientific theories are not rejected in cavalier fashion, but only on the basis of almost incontrovertible evidence". The point of disagreement is what we would accept as the "scientific theory" to which we cling until "almost incontrovertible evidence" appears: we might say that the Regression Portfolio, or some variant of it, cannot be rejected on the available evidence, whereas PS would prefer to maintain that the EMH holds. This leads to the third reason for ignoring the EMH in the original paper, the fact that, unlike PS, we did not agree that "the EMH in its weak and semi-strong forms is highly plausible".

The EMH is certainly *fashionable*, but, in view of the aforementioned difficulties of refuting strongly held theories by statistical testing, it is important that we should constantly question the *plausibility* of fashionable ideas. In its weak form (that market prices cannot be predicted from their past movements), the EMH is quite plausible, especially in view of the vast amount of statistical testing which has been done (albeit that randomness cannot rigorously be "proved" to exist) and the fact that chartist techniques are so widely known that we would expect any information which they offer to be disseminated and acted upon very rapidly. The semi-strong form is a different matter. In a sense, it could be regarded as a tautology: if it merely defines "publicly available information" as "that which the market discounts", then we can say that it is plausible that "the market discounts that information which it discounts when it becomes available". However, if, by "all publicly available information" we mean all information which is relevant to the future financial performance of a company, irrespective of

whether the market recognises it as such or has a correct model of how to use it, it is much less plausible that the market discounts all such information correctly[4] as soon as it becomes available. The latter interpretation of the semi-strong EMH seems to be favoured by PS ("…the stock market is efficient, in the sense of being a speedy *and unbiased* processor of information…" (my emphasis)). It is an interpreation which entails an element of *economic* efficiency (predicting the "true" value of a share as accurately as is possible) as well as *technical* efficiency (responding speedily to new information), and if the market were efficient in this sense there would be no scope for improving the techniques of fundamental analysis, or for the successful working of any model of the Regression Portfolio type.

This inevitably calls to mind a celebrated and much-quoted passage from Keynes' *General Theory* (3) (Chapter 12) in which he emphasises the importance for the stock exchange investor of anticipating the future behaviour of other stock exchange investors, rather than the intrinsic worth of shares: "For it is not sensible to pay 25 for an investment of which you believe the prospective yield to justify a value of 30, if you also believe that the market will value it at 20 three months hence" (Keynes (3), p. 155). Such a situation is consistent with the tautological form of semi-strong efficiency described above, in which the market reacts speedily to such information as it chooses in the manner in which it chooses, but does not use this information to great effect in anticipating the future financial performance of the individual firm. The results of testing the Regression Portfolio are also very broadly consistent with such a view, although they certainly do not constitute a stringent test of it. It is notable that, as stated above, statistically significant regression coefficients *were* obtained for the explanation of future income, i.e. the Regression Portfolio could "beat the market"[5] in the anticipation of an important aspect of changes in the market's own evaluation of shares.[6]

In such a situation we might hope, with Baumol (1), that "true value will out" in the long run. However, an investment strategy based upon an anticipation of financial performance superior to that of the rest of the market may be successful in capital performance terms only in the long run, and over any period of time capital performance will be subject to the vagaries of market fashion. The stronger the latter effect, the lower the profitability of investment strategies which "beat the market" in the sense of anticipating fundamental performance characteristics, and the more likely are such strategies to be undiscovered or unexploited.

In conclusion, the argument can be summarised as follows:

(1) Even if the Regression Portfolio results are taken as a strong refutation of the effectiveness of the model, this can hardly be regarded as "a fairly stringent test" of the semi-strong EMH, as many other plausible models remain untested. The most that could be claimed would be consistency with the semi-strong EMH.

(2) In fact, the stringent Type 1 error criterion used in our significance testing procedure, combined with the limitations of the data and the specification of the model, means that the tests were weighted against the acceptance of the Regression Portfolio hypothesis. The results of this testing procedure do not permit us to assume that we should accept the null hypothesis which would be consistent with a semi-strong form of the EMH.

(3) The semi-strong EMH does not appear to be "highly plausible" (and therefore a hypothesis to be maintained in the absence of "almost incontrovertible" evidence in

refutation) if it is interpreted as meaning that the market uses publicly available information in the most efficient possible manner for predicting the future financial performance of individual companies, in the manner attempted by fundamental analysts. Much more research is needed into the question of the predictive content of share prices, and the original Jones, Tweedie and Whittington paper was intended as a small contribution to this: it would not, however, claim to be "a fairly stringent test" of the semi-strong EMH.

NOTES

[1]Our geographical dispersion has prevented the co-authors of the original paper from collaborating in this brief note, but they are in agreement with its main arguments. I am also indebted to Ken Peasnell and Len Skerratt for constructive criticism of the argument, although they would not agree with all of the conclusions.

[2] It is instructive to explore the situation in which this *would* be the case, i.e. when there were two "favourites", one of which withdrew. The existence of "favourites" implies prior evidence to justify this ranking: PS do not advance such evidence for the EMH, although the original Jones, Tweedie and Whittington paper did advance evidence for favouring the Relative Decline Model. Note, however, that the analogy of the race is imperfect in this context, as there does not have to be a single "winner": more than one model could "beat the market" if the EMH did not hold.

[3]Although the usual statistical tests do, in appropriate conditions, have the efficient property that Type 2 error is minimised *subject to the level of Type 1 error* which is allowed.

[4]"Correctly" should be taken to mean "in an unbiased manner" rather than "with absolute precision". The market may over-react to some information and under-react to others, but it will be "efficient" if it is right "on average" and if there is no further *ex ante* information which enables us to distinguish over-reaction from under-reaction.

[5] This judgment is, of course, subject to the reservations expressed earlier about the statistical testing process.

[6] Take-overs also spoiled the relationship, but it could be argued that the market has at least a permissive role in take-overs, so that these are another aspect of future market behaviour,

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On the Use of the Accounting Rate of Return in Empirical Research

Geoffrey Whittington*

Introduction

Accountants are acutely aware that, despite the proliferation of Accounting Standards, published financial statements contain a good deal of subjective judgment and variety of practice, which make them not strictly comparable between the same company for different years (time series analysis) or between different companies for the same year (cross-sectional analysis). Furthermore, the recent debate on accounting in a period of rapid inflation has served to emphasise that accounting measures of value and income are very different from those of the economist, and a series of academic papers, Harcourt [1965] and Solomon [1966] being seminal works, has demonstrated that there can be important divergences between the Accounting Rate of Return (ARR)[1] and the Internal Rate of Return (IRR) on investment, the latter being the more relevant return for the appraisal of economic performance. In these circumstances, it is not surprising that many accountants are sceptical of the value of using the ARR, calculated from published accounts, in empirical research, particularly in economics,[2] but also in the area of accounting and finance.

In this paper, we shall be concerned with the measurement of economic performance *ex post*, i.e. with the comparison of the observed ARR for a year, or the average for a number of years, with the IRR. The latter is defined as that rate of discount which will give a zero initial Net Present Value of the lifetime cash flows of a project or (in the case of the whole firm) a group of projects. The calculation of an *ex post* IRR for comparison with an ARR calculated from financial reports has a serious practical drawback in the case of a continuing firm: IRR requires estimates of all future cash flows, which will be extremely subjective in a world of uncertainty. It is this practical obstacle to calculating IRR or any other measure of economic income (explored comprehensively by Kaldor [1955], pp. 62–64), which makes ARR, despite its possible deficiencies, a popular practical alternative for appraising the *ex post* profitability of companies, e.g. in monopoly investigations. In the literature investigating the relationship between ARR and IRR (e.g. the papers by Harcourt and Solomon) it is customary to make 'golden age'

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[1]Sometimes referred to as the Book Yield.

[2] A comprehensive survey of the possible mis-use of book yields (in practice, such as monopoly policy, as well as in empirical research) was provided by R.C.Morris [1971].

assumptions of complete certainty about the future, so that *ex ante* and *ex post* IRRs are identical (expectations are always fulfilled). It might reasonably be argued that this biases the case against ARR, since we are comparing a practical measure (ARR) with a theoretical ideal which is impractical (IRR under conditions of certainty). It should also be noted that the IRR is not always an ideal measure of economic performance even under conditions of certainty, e.g. the IRR assumption of constant discount rate throughout the lifetime of the investment may be inappropriate when interest rates change through time, and maximising a rate of return, such as IRR, is identically equivalent to maximising the absolute amount of profit only when the amount of capital investment is assumed to be fixed. However, in the subsequent argument, we shall accept the framework which is conventional in the current literature and compare ARR with an unambiguous IRR, calculated under conditions of certainty, which is assumed to be an ideal measure of economic performance.

The purpose of this paper is not to deny the justification for scepticism about some uses of ARR but to define those uses in which the deficiencies of ARR are relatively unimportant and to identify the specific sources of deficiencies in ARR, so that they can be corrected or allowed for in uses in which they are potentially important. Section II is devoted to the first task, of suggesting uses in which ARR, with all its deficiencies, may be of some relevance. Although this section is couched in terms of using ARR as a proxy for IRR, it is, in fact, a general statement about the use of proxy variables, which may be of some use in other accounting applications. Section III concentrates on the second task of identifying the sources of its deficiencies, particularly in circumstances in which ARR is used as a proxy for IRR. Both of these tasks are important, because the ARR is widely available in published financial statements and it is therefore widely used. Although the user of ARR in Harcourt's words 'does so at his own peril', it seems likely that the absence of better information will force him to continue to use ARR, and it is better to define the nature of the peril and draw up safety rules, rather than to forbid the use of ARR.

Circumstances in which Accounting Rate of Return may be a satisfactory measure

The most obvious type of situation in which the use of Accounting Rate of Return is legitimate is the tautological one in which the relevant variable *is* ARR rather than IRR or some other variable which has ideal theoretical properties. Although the possibility of such a situation is obvious, it may be less obvious that it is likely to occur very often. In reality, because, as emphasised above, ARR is so readily available, whereas information with more desirable theoretical properties is not, ARR (or its components, accounting profit and book value of assets) may often be the relevant variable in explaining how people actually behave. If the object of an empirical study is positive (i.e. explaining actual behaviour) rather than normative (i.e. defining optimal behaviour) ARR may be superior to IRR or other measures merely because, in a world of uncertainty and imperfect information, it is the rule of thumb to which decision-makers cling.

A good example of the use of ARR in this way is by Myron J.Gordon in his well-known share valuation model (M.J.Gordon [1962]), in which the ARR is used as a

variable which explains share valuation, on the grounds that investors will use it in their projection of future earnings and dividends. Another example is its use by Singh [1971 and 1975] to explain the incidence of take overs: it is a plausible hypothesis to suggest that companies with low ARRs have a relatively high probability of being taken over, because their management is perceived as being inefficient (albeit on the basis of a fallible rule of thumb) by shareholders and bidders. The ARR is the relevant variable to use in testing this hypothesis.[3] An application in the broader area of the economics of the firm, which is quite common (e.g. Lewellen [1968] and Lewellen and Huntsman [1970] using US data, and Cosh [1975] and Meeks and Whittington [1975] using UK data) is as a factor determining the pay of top managers. Many other applications can be found.

A related application in which ARR is used as an explanatory variable is in the area of forecasting. If forecasting is done on the basis of a properly specified behavioural model which makes use of ARR, this is merely an extension into the future of the type of positive model described in the previous paragraph. Examples of such work are Weaver and Hall's [1971] model for predicting share prices (in which the use of ARR is suggested, but not tested), and Jones, Tweedie and Whittington's [1976] model for selecting highyielding shares. In the case of naive forecasting, the sole justification for including any explanatory variable, such as ARR, is that it has predictive power, and it is not necessary to specify the detailed underlying causal relationships. An example of such an exercise (which does not make use of ARR, although it might well have done so) is Coen, Gomme and Kendall (1969).[4]

In addition to the cases in which ARR is the variable which the model requires, there may also be circumstances in which ARR is a suitable proxy for IRR. There are three main sets of extenuating circumstances which can eliminate, or at least reduce, the errors arising from using ARR as a proxy for IRR:

(1) *Unsystematic Error*

If we wish to use ARR as a substitute for IRR, or some other index of economic effectiveness, de-

[3]It does not, however, follow that normative inferences can necessarily be derived from the results, e.g. we can say that the hypothesis does not hold (as is, in fact, the case), using ARR, but we cannot necessarily infer that this implies that 'inefficient' companies do not suffer a high incidence of takeover. The latter statement depends on the extent to which ARR reflects IRR or some other 'economic' measure.

[4]This should not be taken to imply that naive forecasting is itself a particularly satisfactory procedure: there must always be some scepticism as to the future stability of a relationship which has no clear theoretical justification. See, for example, the critical discussion at the end of the paper by Coen, Gomme and Kendall.

viations between ARR and the true measure are misleading only if they lead to a systematic bias. For example, if we are concerned with the influence of firm size on profitability, we would probably wish ideally to regress IRR on a size measure. In

practice, IRR is not available, so we may wish to use ARR as a proxy.[5] In such a case, the substitution of ARR will be misleading only if the difference between ARR and IRR is systematically correlated with the explanatory variable. For example, if the effect of accounting practices is such that ARR typically exceeds IRR for firms above a certain size and this excess tends to increase consistently with firm size, the apparent relative profitability (measured as ARR) of large firms will be overstated, and the regression coefficient of Profitability on Size will be biased upwards by the substitution of ARR for IRR. If, on the other hand, the difference between ARR and IRR is uncorrelated with size, the regression coefficient will be unbiased, although random variations between ARR and IRR may add to the degree of stochastic 'noise' in the estimation process, reducing the degree of statistical accuracy of the estimates.[6]

More formally, we may state the argument, in terms of the above example, as follows:

We assume that ARR and IRR are linearly related, with a stochastic disturbance term:

$$A_i = c + d.I_i + \mu_i \tag{1}$$

where

A is *ARR*

I is *IRR*

μ is a stochastic error term with zero mean, and cov $(\mu_i I_i)=0$

i refers to the i^{th} firm

c, d are parameters

We wish to estimate the relationship between IRR and Size, which is of the form:

$$I_i = \alpha + \beta.S_i + \epsilon_i \tag{2}$$

where

S is Size

ϵ_i is a stochastic error term with zero mean, and cov $\epsilon_i S_i = 0$

α, β are parameters

If we instead use ARR as an observable proxy for IRR, we have:

[5]This has been done by a number of investigations such as Steckler [1963] in the USA and Samuels and Smythe [1965] and Singh and Whittington [1968] in the UK.

[6]In fact, it is possible to think of plausible reasons why the error introduced by using ARR should be correlated with Size, particularly as Size will often be the denominator of ARR, but this is outside the scope of the present paper. The problem would be avoided if Size were measured in terms of Sales, or some other variable not contained in ARR. The regression of Profitability on Size is only one of many possible applications in which ARR may be used as a proxy for IRR. It is chosen here as an illustration because of its simplicity and its popularity in empirical research. There is, in addition, the familiar 'errors in variables' problem if the measurement of Size is subject to error. For the purposes of this section of the paper, it is assumed that Size (or whatever other explanatory variable is used) is not subject to error.

$$A_i = a + b.S_i + e_i \tag{3}$$

which, substituting (1) above, is equivalent to:

$$(c + d.I_i + \mu_i) = a + b.S_i + e_i \tag{4}$$

If we make the following assumptions:

(i) cov $(e_i S_i) = 0$
(ii) cov $(\mu_i S_i) = 0$
(iii) $c = 0$
(iv) $d = 1$

(4) now becomes:

$$I_i = a + b.S_i + (e_i - \mu_i) \tag{5}$$

Now b is an unbiased estimator of β and a of α, since the error term is a random variable (the sum of two random variables) and is independent of S_i.[7] Obviously, (5) may have a higher residual variance than if we were able directly to test the fundamental relationship (2) (i.e. it is possible that $\text{Var}\ (e_i - \mu_i) > \text{Var}\ \epsilon_i$) but this does not bias the resulting parameter estimate, although it does prevent us from putting a precise confidence interval about the estimate unless we can somehow deduce the properties of μ_i.[8]

It is important to emphasise the fact that random errors need not bias results. Many accountants resort instinctively to arguments of an anecdotal nature, referring to individual observations (…a firm I know of valued its stock in such and such a fashion…how would that affect your statistical analysis?). Such arguments need be taken seriously only if they indicate a systematic bias in the relationships being examined: otherwise they are merely partial explanations of why we need an error term, i.e. why the observed relationship between the dependent variable and the explanatory variables is not exact.

[7] Assuming that S_i is not itself subject to error. If this assumption does not hold b will be biased downwards.

[8] The simplest assumption is $\mu_i = 0$ for all i: this is a convenient assumption, since $(e_i - \mu_i)$ now becomes e_i. Note that $\mu_i \neq 0$ does not necessarily mean that the variance of the true residual, $(e_i - \mu_i)$ in (5), is greater than the variance of the observed residual, e_i in (3), as cov $(e_i \mu_i)$ is not necessarily $\leq$zero.

(2) *ARR as a Comparative Measure*

It is apparent from the above discussion of the relationship between profitability and size that, for some purposes, we do not require that ARR be equal to IRR even on average. For example, if we are comparing Profitability and Size across firms, provided that *deviations* of ARR *from its average* are equal to deviations of IRR from its average, ARR will be a perfect surrogate for IRR in a cross-sectional comparison.[9] If there are random divergences between the two sets of deviations from average (as described above) the use of ARR as a surrogate will still yield an unbiased estimate of the effects of Size on IRR, provided that there is, on average, a one-for-one correspondence between the two sets of deviations.[10]

More formally, this can be stated, in terms of our earlier example, as follows. If we are interested only in the coefficient β, then the estimate of this in (5) is unaffected even if $c \neq 0$, i.e. if there is a non-zero constant term in the relationship between ARR and IRR. The effect of such a constant term is merely to bias the constant term in (5) as an estimate of α. We now have:

$$I_i=(a-c)+b.S_i+(ei-\mu_i) \qquad (6)$$

Furthermore, for many purposes, we do not even require a one-for-one correspondence: this is necessary for the use of ARR to give an estimate in terms of *units* of IRR, but we may be interested only in the *direction* of the effect. In the latter case, it is sufficient that ARR is correlated with IRR (provided, of course, that the residual is independent of the explanatory variable used in the analysis). For example, in terms of our Profitability-Size example, we may wish to know whether 'true' profitability (IRR) increases with Size but we may not be interested in the exact extent of the relationship (i.e. the percentage points increase in IRR for a £1 million increase in the Size measure). In such a case ARR is an adequate substitute for IRR for the purpose in hand provided (a) that it is correlated with IRR,[11] and (b) that the variance of ARR which is unexplained by IRR is uncorrelated with the explanatory variable used in the analysis (in our example, Size).

[9]The same would be true of a time-series comparison, although serial correlation of errors may be a serious problem in such a case.

[10]This is a consequence of the fact that a regression coefficient measures the relationship between deviations from the individual averages of a pair of variables.

[11]As shown later the correlation may be positive or negative, although, in the latter case, we must reverse the sign of the coefficient estimated using ARR, to assess the effect on IRR.

Again, this proposition can be more formally stated, within the framework of our chosen example, as follows. If $d \neq 1$ (in (1)) but also $d \neq 0$, we can still deduce the sign of β (in (2)) from the sign of b (in (3)). Substituting our new assumption about the value of y, equation (6) now becomes:

$$I_i = \frac{(a - c)}{d} + \frac{b}{d} \cdot S_i + \frac{(e_i - \mu_i)}{d} \qquad (7)$$

b is still an unbiased estimator of β. Unfortunately, we are unlikely to know the precise value of d, which would enable us to derive b, but we may be able to make an assumption as to the sign of d. In this case, we can deduce the sign of b, but not its precise value, e.g. if $d>0$ and $b/d>0$, then $b>0$.

(3) *Adjustments to Remove the Effect of Errors in Accounting Data*

There are certain situations in which accounting data are subject to obvious biases. One example is where one company takes over another company of comparable size: in such a situation the subsequent accounting rate of return will be affected crucially by the accounting practices employed to describe the take over, e.g. whether a 'purchase' or 'pooling' approach is adopted to the acquired firm.[12] When such events can be detected, the empirical research worker can attempt to deal with them by appropriate adjustments to the ARR data.[13] If such adjustments are not possible, it may be appropriate to apply the draconian measure of omitting entirely those observations which are affected by mergers and take overs, provided that this does not lead to an important bias in the sample selection process.

An alternative method of adjustment is possible when the sources of bias in ARR are known. In such a case, the sources of bias can be explicitly included in the analysis, so that the variations in ARR which they cause can be attributed to them rather than to the other explanatory variables. For example, growth of assets is a wellknown potential source of bias in ARR. In a period of inflation, the higher the recent rate of growth, the higher the relative valuation in the denominator of ARR and the higher the relative valuation upon which the depreciation charge is based, in calculating the numerator.[14] These two biases reinforce one another, one decreasing the numerator (profit) and the other increasing the denominator (capital employed). Thus, other things being equal, rapidly growing companies will tend to have a lower ARR because of the measurement problem, not because their IRR is relatively low. By introducing recent growth as an

[12]For an excellent critique of US practice in this respect, see Reinhardt [1972], pp. 9–15.
[13]An interesting example is Meeks [1977], a study of post-merger performance, in which post-merger ARR is related to an estimate of the pre-merger ARR which is a weighted average of the ARRs of the parties to the merger.
[14]Reducing-balance depreciation can create a similar bias even in the absence of inflation.

example of this is Whittington [1972], a cross-sectional analysis which attempts to relate future profitability (measured as ARR) to various sources of finance. Past growth and past profitability (ARR) are also included as explanatory variables, partly because of their explanatory variable, we might hope to attribute at least some of this effect[15] to its true source. An possible influence on the measurement of future profitability in terms of ARR as well as because of their possible causal influence on true profitability (IRR). Obviously, in such an analysis, it is impossible to estimate the extent to which the apparent influence of past ARR and growth is due to real causal factors, rather than measurement bias, but at least it can be hoped that they capture most of the measurement bias, leaving the estimates of the influence of different sources relatively free of such bias.

Deficiencies of ARR as a proxy for IRR

In this section we are concerned with the known sources of discrepancy between ARR and IRR, i.e. with the factors determining the parameters of equation (1).

The two pioneering papers, by Harcourt [1965] and Solomon [1966],[16] calculated the divergences between ARR and IRR both for individual projects and for balanced stocks of projects on alternative assumptions about depreciation policy, asset life, and growth of asset stock. In addition, Harcourt investigated alternative quasi-rent patterns to the 'one-hoss shay' rectangular pattern, and Solomon investigated the effect of price level changes. They found important discrepancies between ARR and IRR due to the fact that the accountant's measure of depreciation does not necessarily follow the pattern of economic depreciation implied by IRR (valuing the asset as the net present value of its future receipts, discounted at the IRR). They both concluded that ARR is not an accurate measure of IRR and, furthermore, failed to find a systematic pattern in the discrepancy which might have allowed a correction to be made.

From the point of view of empirical work of a statistical nature, the conclusions of Solomon and Harcourt are not as depressing as their authors found them. Their discovery of an arbitrary and apparently unsystematic discrepancy between ARR and IRR explains the need for an error term in equation (1). We would prefer this term to be as small as possible, but it need not bias our estimates of the coefficients. These authors were, of course, worried about the use of ARR as a proxy for IRR in a wide range of applications such as the regulation of public utility prices (Solomon) or the comparison of the performance of a particular industry over specific periods of time (Harcourt): in such cases, it might not be sufficient to be right 'on average'.

[15]This statement is put in a relatively weak form because we need to know the precise functional form which the bias takes in order to eliminate it completely: the bias is not necessarily a simple linear function of growth measured over an arbitrarily chosen period. Furthermore, when growth is itself measured in terms of assets or profits reported in company accounts, it may be subject to some of the same measurement errors as ARR.

[16]Solomon published some of his results in 1961 as testimony to the Federal Power Commission. See Solomon [1971].

Later work by Livingstone and Salamon [1970], Solomon [1971], Stauffer [1971], Bhaskar [1972] and Gordon [1974] extended the earlier work, but the only important generalisation was that the IRR and ARR are equal for a firm in steady state growth at a rate g which equals the IRR (a 'golden rule' situation).[17] However, Gordon (analytically) and Bhaskar (by deterministic simulation) show that the discrepancies between ARR and IRR are minimised if the accountant chooses a depreciation method which approximates the economic depreciation implicit in IRR.

The paper by Bhaskar also contains an interesting probabilistic simulation exercise, in which alternative sets of data are generated from a common basic model (a small firm with a balanced stock of 'one-hoss shay' assets) by making the quasi-rents and asset lives vary in a stochastic manner. A cross-sectional regression of the same form as equation (1) was estimated across the resulting data, and it was found that the constant term was always negative ($c<0$) and the slope coefficient (d) greater than unity. In terms of the earlier analysis, this would imply that, in using ARR as a surrogate for IRR in empirical work, we can deduce the direction of the influence of the explanatory variable on IRR but not its extent. However, this result may be sensitive to the assumptions of the common underlying model, such as no growth and a constant expected value of quasi-rents.

A recent paper by Kay [1976] has provided a much more general analysis of the relationship between ARR[18] and IRR. By dealing with continuous time, rather than discrete time, Kay is able to use more powerful analytical techniques, and obtains a number of useful generalisations:[19]

(i) If ARR on a project is constant over the project's life, it is equal to IRR.

Apart from the consequence for empirical work that stability of ARR over time suggests that it is a reasonably good proxy for IRR, this has a particularly interesting implication for government regulation of prices: when government regulation is based on the achievement of a constant ARR, this will also lead to the achievement of an IRR identical with that ARR.

(ii) Every sequence of ARRs defines a valuation function under which the present value of the cash flows of the project is zero.

In other words, if the cash flows of a project (both inflows and outflows) are discounted back to its starting point, using the ARR obtaining in each period as the discount rate for that period, the same result would be obtained by discounting at the constant IRR throughout the life of the project. The case of constant ARR ((i) above) is a

[17]Another result of this work was to reveal that ARR should be measured net of depreciation in order to approximate IRR best.

[18]Measured net of depreciation.

[19]Not all of these claim to be original, some having been derived by earlier writers, such as Vatter [1966].

special case of this general relationship. Where ARR is not constant, the problem becomes one of finding an appropriate averaging device which will yield IRR, or a close approximation to it. It transpires that the simple unweighted average ARR of a project is not a good device for this purpose. Intuition would suggest that this is because a simple average gives the same weight to later ARRs (which occur further in the future and are therefore less valuable) as earlier ARRs (which occur sooner and are therefore more valuable). That this is, in fact, the deficiency in simple averaging of ARRs is confirmed by Kay's third generalisation:

(iii) If the value of capital employed is discounted at IRR, the weighted average ARR is equal to IRR.

In other words, periodic ARRs are averaged, using as weights the average book values of assets employed for the appropriate periods, and discounted back to the start of the project at IRR. Since IRR in these circumstances is equal to the resulting weighted average ARR, Kay is able to propose a method of adjusting a series of observed ARRs and book values to yield IRR. In the example which he chooses, that of an aggregate of continuing companies (in fact, all of the larger companies in UK manufacturing industry), he has to accept the accountant's book values of initial and terminal values as being equivalent to the economist's values (present values of future flows, discounted at IRR), and this is a general restriction of the usefulness of his method in empirical studies of continuing companies.[20] Obviously, in estimating the IRR of an individual project, with limited life, from observed lifetime accounting data, the Kay method does not suffer from this restriction and is very powerful, as it does not depend upon any particular depreciation scheme being used by the accountant.

Further analysis of the Kay adjustment reveals that it is not likely to be of much importance when there is no time trend in ARR. When ARR declines with time, a simple average ARR will be below IRR, and, conversely, when ARR rises through time, its simple average will be above IRR. This follows intuitively from the fact that the adjustment is essentially a weighting process, the weighting declining with time: e.g. if ARR does not vary systematically through time, the weighted average is not likely to differ greatly from a simple average. The latter result is of importance for empirical work which studies whole firms which are aggregations of different projects and which are therefore likely to exhibit more stable rates of return than individual projects. One special case of aggregation, which had been explored by earlier writers, is steady-state growth, for which Kay derives his next generalisation:

(iv) For a firm in steady-state growth at rate n, the ARR is constant and the book value of capital grows at n.

For a continuing firm, constancy of ARR does not (as for a finite project) necessarily imply that ARR=IRR, unless the accountant's initial and terminal values for the observed period coincide with those of the economist. However, on the 'golden rule' path, where n=IRR, we have the situation described earlier, in which ARR=IRR, because the growth of the discrepancy between the accountant's book value and economic value (which takes place at rate n) is exactly offset by the effect of discounting (at IRR=n). The general

[20]It might be argued that Current Cost Accounting could improve the applicability of his methods, since CCA balance sheet values might be better surrogates for economic value than are the historic cost values used at present.

steady-state relationship between the ARR *(a)*, IRR *(r)*, growth rate (n), economist's value of the firm *(W)* and book value *(V)* is contained in Kay's fifth generalisation:

(v) For a firm in steady-state growth relationship $(n-a)/(n-r)=W/V$ holds.

On the plausible (but not inevitable) assumption that $r \geq n$ (IRR exceeds growth rate) and that $W \geq V$ (the accountant values assets at less than the economist's value, because of the doctrine of conservatism), then $a \geq r$, i.e. the ARR will be greater than IRR. The nearer are the two sets of values (W and V) then the nearer are the two rate of return measures.

Kay goes on to derive propositions about management policies based upon accountants' profit measures. These are interesting but do not have an immediate bearing on the matter in hand: the use of ARR as a proxy for IRR in empirical studies. For our present purposes, it is sufficient to summarise Kay's results as follows:

(1) There is a general analytical relationship between ARR and IRR. IRR can be derived as an appropriately weighted average of ARRs.

(2) For an individual project, this weighted average may be calculated exactly, but for a continuing firm, errors may remain because of the discrepancy between accounting and economic values of assets at the beginning and the end of the period.

(3) If a simple unweighted average of a project's ARR is taken, this will be a good proxy for IRR when there is no time trend in ARR, and a perfect one when ARR is constant. When ARR declines through time, the simple average will under-estimate IRR; when ARR rises, the simple average will over-estimate IRR.

(4) In the case of a firm in balanced growth, ARR=IRR where the growth rate=ARR (and therefore=IRR). In cases where the rate of growth is less than IRR, it is reasonable to assume that ARR≥IRR, because of the accountant's conservative tendency to undervalue assets.

(5) We might reasonably expect that for a firm as opposed to a project, the process of aggregating a number of projects of different ages, length of life, etc., would lead to relative stability of ARR and thus to relatively small divergences between average ARR and IRR. We might also expect that the process of averaging over a longer period of years will diminish the effect of the discrepancies between the economist's and the accountant's valuations of opening and closing assets. Unless these discrepancies grow proportionately with time, their importance will be reduced because they will be quantitatively smaller relative to the flows, as the period for measuring the flows increases.

Conclusion

We have argued (in Section II) that there are circumstances in which ARR might actually be preferable to IRR in empirical research, because of its ability to explain actual behaviour. It was also argued that, in cases in which IRR is the ideal variable which is required, ARR can serve as an unbiased proxy, provided that certain statistical independence conditions are fulfilled. Furthermore, it was argued that, in the latter context, statistical biases might be eliminated by appropriate construction of the model or adjustments to the data.

We next (in Section III) surveyed the considerable literature on the relationship between ARR and IRR. It is clear that there can be considerable divergences between the two measures and that any correspondence between them in practice is likely to be a statistical average relationship rather than an exact one. However, it is also clear that the two measures do have an analytical relationship to one another and that, in certain circumstances, there can be an exact correspondence. In empirical work, we shall have more confidence in using ARR as a proxy for IRR when we have a large number of observations (to minimise the effects of random variations), a long observation period for measuring ARR (to average out the inevitable arbitrary year-to-year fluctuations resulting from accounting measurement), a large aggregate of projects (such as a whole firm) over which ARR is measured (to average out the peculiarities of individual projects), no obvious trend in ARR, and similar rates of growth. We should beware of making comparisons across small numbers of observations (such as comparing a pair of companies), measuring ARR for short periods (such as a single year) or single projects, or across firms with widely divergent rates of growth, and should avoid using unweighted average ARR when there is a clear time trend in the ratio. We should also beware of comparisons across companies with characteristics such as vastly different rates of growth, or belonging to different industries (with assets of different length of life, etc.) which are likely to lead to different degrees of discrepancy between the accountant's book value of assets and economic value.[21] However, we should also be aware that such factors will not necessarily invalidate an empirical study, if the discrepancies between IRR and ARR are not correlated with the explanatory variables used in the study.

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AUTHOR'S NOTE (1986)

Following the publication of this paper, correspondence with Professor Skerratt revealed a degree of sloppiness in the econometric argument of pp. 203–4 of the paper. The main results stated in the paper do hold, but the distinction between the population models (equations (1) to (7)) and estimates of those models is not clearly made. Also there is an error on p. 204 in that it is b/d in equation (7) (not b), which is equivalent to β.

The following note represents our mutually agreed view of how the exposition of pp. 203–4 should have been expressed.

ON THE USE OF THE ACCOUNTING RATE OF RETURN IN EMPIRICAL RESEARCH: A CORRECTION

by L.C.L.SKERRATT, UNIVERSITY OF DURHAM and G.WHITTINGTON, UNIVERSITY OF BRISTOL

Whittington (1979) in equations (1) through (7) discusses the extent to which ARR can proxy for IRR. Although the thrust of the argument is not in doubt, the logic of the exposition requires clarification, since there is some confusion between the true (population) parameters of an economic model and the regression sample estimates of those true parameters. The revised exposition is as follows:

Suppose that equations (1) and (2) are the true unobservable relationships between A, I and S. 157

$$A_i=c+d.I_i+\mu_i \qquad (1)$$

$$I_i=\alpha+\beta.S_i=\varepsilon_i \qquad (2)$$

where

A is ARR
I is IRR
S is size
μ_i and ε_i are random errors.

If I cannot be easily measured, then A may be used in specifying the relationship between return and size, as in equation (3).

$$A_i=a+b\ S_i+e_i \qquad (3)$$

It can easily be shown that for c=0 and d=1, b is identical to β, the coefficient on size in the equation of theoretical interest.

PROOF:
From equations (1) and (3)

$$c=dI_i+\mu_i=a+b\ S_i+e_i$$
$$I_i=a+b\ S_i+(e_i-\mu_i) \qquad (4)$$

Taking expectations of (2) and (4)

$$\alpha+\beta E(S_i)=a+bE(S_i) \tag{5}$$

Since the parameters α, β, a and b are independent of $E(S_i)$, then equation (5) requires

$$a=\alpha \tag{6}$$

$$b=\beta \tag{7}$$

Consequently, unbiased estimates of the parameters of equation (3) will provide unbiased estimates of the parameters of equation (2).

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However, nothing comes without cost and there is a drawback of estimating equation (3) rather than equation (2). From equations (2), (4), (6) and (7) it follows that

$$e_i=\varepsilon_i+\mu_i \tag{8}$$

In the likely case of zero covariance between μi and εi (the error with which ARR proxies IRR is independent of the error with which size can explain IRR) then $Var(e_i)>Var(\varepsilon_i)$. This means that the precision with which b can be estimated from equation (3) is likely to be less than estimating directly from equation (2). Consequently, the chances of a type II error are increased.

The above approach can also be employed to analyse the cases of $c\neq0$ and $d\neq0$ (p. 204 of the original paper). In the former, then equation (6) needs to be revised,

$$a=\alpha+c \tag{6a}$$

but equation (7) still holds.

Therefore, equation (3) will still capture the influence of size on IRR.

When, in addition, $d\neq0$, i.e. there is a scaling problem in calculating a proxy for IRR, then

$$a=\alpha+c \tag{6b}$$

$$b=\beta.d \tag{7a}$$

That is, the sign of β can be inferred from b if the sign of d is known. However, from equations (2), (4), (6b) and (7a), it follows that

$$e_i = dE_i + \mu_i \tag{8a}$$

and, consequently, the precision of the estimate of b is reduced.

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9
THE ECONOMIC RATE OF RETURN AND THE ACCOUNTANT

Geoff Whittington

INTRODUCTION

The economist is most likely to associate Geoff Harcourt's name with the capital theory controversies and the development of post-Keynesian economics. The contents of the present volumes provide ample evidence of his contributions in these fields. However, he has also made an extremely important contribution to bridging the gap between economists and accountants in the related areas of income measurement and the measurement of the rate of return.

In the area of income measurement, Geoff Harcourt's contribution most cited in the accounting literature is *Readings in the Concept and Measurement of Income,* edited jointly with an accountant, Bob Parker (1969). Unlike many collections of readings, this served a really creative purpose by introducing accountants to some of the key economic writings relevant to their own discipline (the reverse flow, from accounting to economics, has, unfortunately, been less strongly apparent). Moreover, the editors' jointly written Introduction provided a synthesis of economic and accounting perspectives which became a standard source of reference in the accounting literature for many years after it was written: for this reason, it was reproduced without amendment in the successor volume (Parker, Harcourt and Whittington 1986).

With regard to the measurement of the rate of return, Geoff Harcourt made a seminal contribution through his paper The accountant in a Golden Age' (1965). This explored the relationship between the internal rate of return (IRR) measure favoured by economists, and the accounting rate of return (ARR) produced by accountants and often used in empirical work by economists. The conclusions, based upon a much more thorough and systematic study than had previously appeared in the literature, were extremely pessimistic. As is so often the case, similar work was conducted at the same time on an entirely independent basis (by Ezra Solomon in the USA) and its results were published shortly after the Harcourt paper (Solomon 1966), whose results they confirmed. The papers by Harcourt (1965) and Solomon (1966) are now the standard original references in a literature on the significance of accounting rates of return, which has flourished during the three decades following their publication.

The purpose of the present paper is to trace the course of that debate, In view of Geoff Harcourt's contributions to the history of ideas, it is hoped that it is a fitting tribute to him to trace the history of one of his own ideas.[1]

THE ACCOUNTANT IN A GOLDEN AGE

Harcourt (1965) proposed

> to examine how accurate is the accountant's measure of the rate of profit under Golden Age conditions where uncertainty is absent, expectations are fulfilled, and the rate of profit has an unambiguous meaning. The following question is asked: would the answer obtained by using the accountant's rate of profit correspond with what is known, under the assumed conditions, to be the right answer, namely, that the *ex post* rate of return equals the *ex ante* one.
>
> (*Ibid.:* 66)

In other words, the accountant's calculation of the rate of return (ARR) was to be compared to the economist's measure of the internal rate of return on investment (IRR), using identical raw data.

The method used to assess the correspondence between the ARR and the IRR was computer simulation. Two basic cases were considered: a balanced stock of machines and a steadily growing stock of machines. In each case, there was a variant which allowed for the accumulation of financial assets, making four cases in all. For each of these cases, four different time patterns of cash flows (quasi-rents) from machines were assumed: constant (a 'one hoss shay' pattern), falling, rising, and rising followed by falling. For each of the resulting sub-cases, two different accounting depreciation methods were tested: straight line and reducing balance. For each of the resulting sub-cases, the IRR was compared with the ARR, assuming various different rates of profit (IRR), lengths of life of machines and (where relevant) rates of growth of investment.

The results of the simulations, which were summarized in both tabular and diagrammatic form, showed, in- many cases, large divergences between the ARR and the IRR. It had been hoped to identify rules of thumb to adjust for the main errors arising from such factors as quasi-rent pattern or growth rate, but 'it is obvious from the calculations that the relationships involved are too complicated to allow this' (*ibid.:* 80). The paper concluded

> that, as an indication of the realized rate of return the accountant's rate of profit is greatly influenced by irrelevant factors, even under ideal conditions. Any 'man of words' (or 'deeds' for that matter) who compares rates of profit of different industries, or of the same industry in different countries, and draws inferences from their magnitudes as to the relative profitability of investments in different uses or countries, does so at his peril.
>
> (*Ibid.:* 80)

SOLOMON, VATTER AND THE EARLY AMERICAN DEBATE

Ezra Solomon's paper. 'Return on Investment: the Relation of Book-Yield to True Yield' was published in an American Accounting Association (AAA) volume in 1966. Solomon had given a paper on the subject as early as 1963 (see footnote to Solomon 1966:232), so that it is clear that Solomon and Harcourt had worked simultaneously in time, but entirely independently, on the same topic. Solomon's paper also followed the method of simulation, but it used a narrower range of alternative assumptions, e.g. a true yield (IRR) of 10% per annum was always assumed. However, four key parameters were varied in the examples: length of project life, cash flow pattern, accounting depreciation policy, and growth rate of the company. The principal conclusion of the study was the same as that of the Harcourt study: 'the ratio of net income to net book assets is not a reliable measure of the return on investment' (*ibid.:* 243). However, Solomon was a little more positive in his view that adjusted ARRs might be useful: 'while we have as yet no precise basis for making these necessary adjustments, the use of models does provide an approximate basis for doing so' (*ibid.:* 243–4). A degree of optimism about the possibility of developing such adjustments was expressed also in Zeff's 'Discussion Comments' on the Solomon paper.

One distinctive feature of the Solomon paper is that he demonstrated analytically that there is a precise correspondence between the ARR and the IRR for a company in balanced growth (i.e. adding similar investments at a steady rate) where the growth rate is equal to the IRR (*ibid.:* 242).

Solomon's paper was published by an academic accounting body (the AAA) and it evoked an early response for an eminent accounting academic, Vatter (1966). The essence of Vatter's critique was to question the validity of the IRR as a standard of comparison for the ARR: 'a mere comparison of two calculations does not establish the inaccuracy or incompetency of one of them' (Vatter 1966:684). Vatter pointed out that the IRR is essentially an *average* yield over the life of a project, not the yield over a sub-period of the project's life. The rate is an annual rate only because we choose to state it that way; it really applies to the entire term' (*ibid.:* 685). He also demonstrated that book yields (ARRs) could be forced, on an annual basis, to be always equal to the IRR if annuity depreciation (based on discounting) were used, but he also pointed out that variable annual ARRs could also be interpreted as (annually variable) discount rates which, like the IRR, would produce zero initial present value of cash flows received over the full life of an investment (*ibid.:* 689–90). This observation provided the essential insight upon which Kay's 1976 analysis (discussed in the next section of this paper) was based. Vatter also questioned the validity of the IRR as a standard for comparison, on the ground that it did not necessarily reflect the opportunity cost of capital (the so-called 'reinvestment' issue). Thus, by questioning the appropriateness of the IRR as a standard, Vatter provided a critique which was to play an important part in the subsequent literature.

Vatter's critique did not, however, have an immediate impact. In 1970 Solomon published a paper which substantially reiterated his 1966 analysis, and in the same year Livingstone and Salamon published the results of a simulation study which was very

much in the spirit of Harcourt (1965), but extending the range of assumptions beyond those considered by Harcourt or by Solomon (Livingstone and Salamon 1970:202). Their results broadly confirmed those of the earlier studies and failed to detect any simple adjustments which would enable ARR to be reconciled with IRR, apart from the special case in which the growth rate is equal to the IRR (which implies that IRR=ARR, so that no adjustment is required).

Stauffer (1971) adopted a more analytical approach to the problem, using mathematical analysis rather than computer simulation, and he extended the range of variables considered, particularly by introducing taxation. However, his conclusions were essentially consistent with those of Solomon, whose work he cited, and Harcourt, whose work he did not cite, and the final sentence of this paper summarizes the predominant view in the academic literature of the time: 'It is clear that further theoretical and empirical research is needed before rates of return can be computed reliably, and interpreted with certainty' (Stauffer 1971:468).

KAY'S RIPOSTE (1976)

The further work which Stauffer called for was not long in coming, although it came in a British journal, *Oxford Economic Papers,* as a follow-up to Harcourt's paper which had been published in the same journal.

The title of Kay's 1976 paper—'Accountants, too, could be happy in a Golden Age'—suggests its theme: that there is an underlying analytical relationship between the ARR[2] and the IRR. Kay defined this relationship mathematically and suggested-an empirical method for reconciling computed ARRs with IRR. He was thus carrying forward the task which earlier authors had set.

Kay's analysis builds upon the observation by Vatter (1966) that the IRR is really an average return calculated over the full life of an investment project. He demonstrated precisely that the IRR can be derived as a weighted average of (variable) annual ARRs over the lifetime of a project, irrespective of the accounting conventions used to calculate ARR. This strikingly general result arises from the 'cash to cash' nature of a single investment project: over the project's lifetime the difference between the total of cash outlays and cash inflows will determine total accounting profit, irrespective of the accounting measurement methods employed, with the one proviso that the accounts should be articulated, i.e. all gains and losses affecting the balance sheet should flow through the profit and loss account.[3]

The crucial weakness of Kay's analysis was that the formal results hold with complete accuracy only for a full 'cash to cash' situation, i.e. when the full lifetime cash flows of the reporting entity are known. This is plausible for a single investment project, but much less so for a whole firm, which may be viewed as a collection of investment projects of different maturity dates which will be replaced by other investments when they mature, if the business is a 'going concern'. The accountant's typical task is to report periodic profits for a continuing business, so that he has available neither the opening cash outlays nor the terminal cash flows which would be necessary to compile a full accounting history of the firm and obtain the precise estimates of IRR from the accounts which could be derived using the Kay formulae. Kay advocated two means of alleviating this

difficulty. First, estimates should be made over as long a period as possible: 'The accountant's rate of profit, measured over a period of years, will be an acceptable measure of the true rate of return: it is over a single year that it may prove seriously misleading' (Kay 1976:459). Second, the problem of the initial and terminal positions is assumed away by using the accountant's book values as proxies for the economic (discounted cash flow) values which are strictly required: The discussion above assumes that the economist accepts the accountant's estimate of the initial and terminal capital stock' (*ibid.:* 453–4).

These assumptions were criticized by Wright (1978), in a robust defence of the Harcourt analysis: 'Alas, we have not escaped from Harcourt's discouraging conclusion' (Wright 1978:467–8). Kay's (1978) response was that the differences were ones of emphasis rather than logical or factual accuracy: he was concerned to dispel the belief that accounting data had no relevance to economic returns. His later work (Kay and Mayer (1986) and Edwards, Kay and Mayer (1987)), was a much more positive response to Wright's critique.

THE FISHER AND McGOWAN DEBATE IN THE USA

In 1983, in apparent ignorance of the work of both Harcourt (1965) and Kay (1976), Franklin Fisher and John McGowan published an important paper on the subject in the *American Economic Review*. The importance of the paper derived not from the originality of its results (most of which had appeared in the earlier literature), but from its appearance in a leading world economics journal (which guaranteed a series of comments published over the next five years) and its specific orientation towards the assessment of monopoly profits.

The paper arose from Fisher's testimony for IBM in the *US v. IBM* monopoly case (Fisher and McGowan 1983:82). The title—'On the misuse of accounting rates of return to infer monopoly profits'—summarizes the theme admirably. The authors' reason for reaching the conclusion that accounting rates of return cannot be used to infer monopoly profits was that 'accounting rates of return, even if properly and consistently measured, provide almost no information about economic rates of return' (Fisher and McGowan 1983:82). This assertion was supported, in an appendix, by mathematical proofs which confirmed the earlier US studies of Solomon (1966 and 1970), Livingstone and Salamon (1970), and Stauffer (1971). The text contained numerical illustrations. In a later comment, Fisher (1984:510) remarked that the failure of Fisher and McGowan to cite Harcourt (1965) 'was particularly unfortunate because of all the literature, Harcourt's valuable article is perhaps the one most closely related to our own work'. Fisher was less charitable to Kay (1976), dismissing his contribution by citing Wright (1978).

The debate in the *American Economic Review*, following Fisher and McGowan's paper, comprised nine notes and comments published between 1984 and 1989. Many were concerned with points of detail or with the measurement of monopoly power, rather than with the relationship between the ARR and the IRR. Two issues which did emerge concerning the latter relationship, and which are still live research issues, are the correlation between the ARR and the IRR and the cash recovery rate approach to measuring the IRR.

The correlation between ARR and IRR was discussed by Long and Ravenscraft (1984) in the Fisher and McGowan debate. It had been discussed earlier by Whittington (1979) in a UK accounting journal, but this, like the other papers in the UK literature, does not seem to have reached the USA. The essential point is that, if ARR is correlated with IRR, albeit subject to error, it can be used in statistical analysis as a proxy for IRR, provided the error is unbiased or any bias can be eliminated by the use of control variables. Empirical tests of the correlation between IRR and ARR and the potential bias arising in empirical studies of concentration and profits are provided by Salamon (1988) and Connolly and Hirschey (1988).

The cash recovery rate (CRR) approach owes its origins to Ijiri (1978). The idea is, essentially, to estimate the IRR from the firm's ability to generate cash, given certain assumptions about project life and the cash flow pattern of projects. This concept was introduced into the Fisher and McGowan debate by Salamon (1985 and 1989) and Buijink and Jegers (1989). A summary of the development of the concept is given by Stark (1987), and a new definition of CRR is proposed by Griner and Stark (1988 and 1991). Brief (1985) provides a critique of the earlier literature, and Hubbard and Jensen (1991) a more recent critique. The essential difficulty facing this approach is that it requires assumptions which are strong enough to infer future cash flows.

The CRR proposal and the other literature reviewed hitherto was all set in the context of the original problem set by Harcourt (1965) and Solomon (1966), which was to infer the value of IRR as the ideal economic rate of return. The next significant contribution to the debate, by Edwards, Kay and Mayer (1987) was to question this assumption.

EDWARDS, KAY AND MAYER

In 1987, Edwards, Kay and Mayer (EKM) published their book, *The Economic Analysis of Accounting Profitability.* This took the earlier debate, starting with Harcourt (1965) as background and repeated the analysis of Kay (1976). It then provided a radical alternative to Kay's earlier analysis. The theoretical framework of this new approach had already been published in a short paper by Kay and Mayer (1986).

At the heart of the new approach were two concepts not previously developed (although they had been suggested) in the literature:

1 that the IRR might not be the ideal economic measure it had previously been assumed to be (this had, as we have already seen, been raised by Vatter as early as 1966); and
2 that the ARR might be a better measure of economic performance if the opening and closing values were measured on current cost ('value to the business') principles, which might produce a better proxy for economic values than depreciated historical cost (this idea was implicit in much of the long debate on price change accounting, but was proposed in the ARR/IRR debate by Whittington (1979:206)).

The first of these new concepts led EKM to consider explicitly the rate of return over a *segment* of a firm's life, thus acknowledging explicitly the accountant's typical problem of measuring returns in a continuing business. They were also accepting Vatter's interpretation of the IRR as an average rate of return over the full (flotation to liquidation) life of a business which would have no particular relevance to performance

over a segment (such as an individual) of a firm's life. They therefore re-defined their ideal economic standard as the cost of capital of the firm, ρ, over the segment for which performance was being assessed, which could be as short as an individual year. They then assessed the validity of a specific accounting measure of the rate of return a (which they described as ARR, although, as already noted, it was not the ARR concept used in the earlier literature) by comparing it with the cost of capital. They demonstrated, in both *ex ante* and *ex post* situations, that the comparison of a with ρ gave the correct signals (in terms of the discounted cash flow capital budgeting model) as to the economic profitability of the firm over the segment. EKM's interpretation concentrated on applications to competition policy (presumably as a response to the Fisher and McGowan debate), but the significance of their analysis is wider, e.g. it could equally well be applied to shareholders' assessments of performance.

The second of the new concepts, the use of 'value to the business' (VTB) as a valuation method for accounting, was a crucial component of EKM's new proposal for the accounting rate of return (which, to avoid confusion with the broader traditional ARR concept, will be denoted by α). Value to the business is based on the following algorithm for valuing assets and liabilities:

$$V_t = \min[RC_t, RA_t]$$

where $RA_t = \max[PV_t, NRV_t]$

and

V=value to the business
RC=replacement cost
RA=recoverable amount
NRV=net realizable value (from sale)
PV=present value of future cash flows (from continued ownership)
t is a point in time.

Thus, in a typical 'going concern' business, assets will be valued at replacement cost, unless replacement would not be justified, in which case recoverable amount is the relevant value. This method of valuation has a long history in the accounting literature (see, for example, the review of the subject in Whittington (1983)), and can be regarded as the current cost equivalent of the accountant's traditional rule 'cost or market value, whichever is the lower'.

EKM's new α measure of the accounting rate of return over a segment of a firm's life was calculated as the return arising from comparing the value of net assets on a VTB basis at the end of the segment, plus net cash outflows to providers of capital during the segment, with the VTB value of net assets at the start of the segment. The validity of α as an economic performance measure was assessed not, as in the previous literature, by its conformity with a measure of IRR, but by the correctness of the decisions which could be reached by comparing α with the cost of capital ρ, on the assumption that $\alpha > \rho$ implied good performance (or, in the *ex ante* case, prospects) and $\alpha < \rho$ implied bad performance (or prospects). In other words, α was used as a ***substitute*** for IRR in the appraisal process and was not being assessed for exact correspondence with IRR. The resulting analysis

demonstrated that, with minor exceptions, α performed well in giving appropriate signals, consistent with the capital budgeting model.

DEVELOPMENTS FOLLOWING EDWARDS, KAY AND MAYER

The Edwards, Kay and Mayer analysis was an important contribution to the continuing debate on the economic interpretation of accounting numbers. Unlike the Fisher and McGowan paper, it was not followed by a spate of critical comments, and it seems virtually to have been ignored in the USA. The only comment of any substance (apart from book reviews) which followed its publication was by Grinyer and Walker (1990), and this was essentially supportive: it demonstrated that the EKM results could be extended to a world of uncertainty by using certainty equivalents.

The main reason why EKM did not evoke a wider response was probably the decline of interest in current cost accounting as the inflation rate slackened during the 1980s. EKM's system depended crucially on the VTB valuation principle, and this was the basis of current cost accounting. There were some theoretical issues surrounding VTB which posed problems, notably the aggregation problem: the sum of the VTBs of individual assets would not necessarily equal the sum of the VTBs of the assets assessed on a more aggregative basis (e.g. at the level of the whole productive unit rather than the individual machine) and this in turn would not necessarily equal the VTB of all of the assets valued together (at the level of the whole business), so that VTB was not an unambiguous concept. However, the main objections were practical: VTB involved comparison of no less than three alternative values (RC, NRV and PV) and each of these was potentially subjective and costly to estimate. In the 1970s, at a time when prices had been changing rapidly, business had been interested in current valuation methods in accounts, because they offered clear benefits of more accurate reporting of economic realities, and less clear, but possibly more important, benefits of relief from taxation and price controls. In the 1980s, lower rates of price change made the benefits less obvious, and experience of applying VTB methods in the USA (from 1979 onwards) and in the UK (from 1980 onwards) made the costs and difficulties more obvious. Thus, by the time EKM published their proposals (1987), the practical prospect of their solution (VTB) being applied was already receding rapidly.

APPLICATION IN THE PUBLIC SECTOR AND UTILITY REGULATION

There was one exception to this general rule: this was the public sector. In 1986, the Byatt Report, addressed to the UK Treasury, advocated a VTB-based accounting system very similar to that of EKM. The recommendation was directed specifically at nationalized industries, but it was claimed that the arguments in favour of it (which were consistent with those of EKM) could also be applied in the private sector. This report was influential not only in encouraging nationalized industries to adopt current cost accounting but also. subsequently, in encouraging regulators of the privatized utilities to adopt it for the purpose of setting price caps. These included British Gas, British Airports

(BAA plc), the regional electricity companies and the water companies (of which Mr Byatt became the regulator).

In the privatized utilities, the use of VTB-based accounts to determine economic rates of return for setting regulatory price caps is currently standard practice and therefore an important policy issue. Unfortunately, there are some serious problems in the process (which are reviewed in Whittington (1994)), not least of which is the potential circularity of the PV element in VTB: if PV is the value to emerge from the algorithm as VTB, this cannot be used as a basis for price setting because it will be determined *by* price (through the effect on future cash flows). Another serious difficulty in the case of utilities, which have large, long-lived fixed investment, is the problem of determining replacement costs when technology is changing.

AN OVERVIEW

It should be apparent that the debate initiated by Harcourt (1965) has been substantial and continues to be important. It is far from being resolved, but it has led to important insights into the relationship between accounting numbers and economic decisions. The issues are of considerable intellectual interest, but they are also of great practical importance for the functioning of market economies in general, and for the work of regulators in particular.

An interesting insight provided by the history of this debate is that, although it is often believed that there is a lack of communication between economists and accountants, this gap was spanned in this particular instance. A less obvious gap, which was not always spanned, is that between the USA and the UK literature. An example of this is Fisher and McGowan's initial (1983) failure to cite Harcourt (1965) or Kay (1976). The subsequent neglect in the USA of Edwards, Kay and Mayer is another illustration of the fact that the USA and the UK are divided, not only by a common language, but also by a separate literature.

NOTES

1 A useful supplement to this is the collection of papers edited by Brief (1986) which contains the most important papers published on the subject before 1983. It does not, however, cover the Fisher and McGowan or Edwards, Kay and Mayer debates.

2 Kay adopted the term accounting rate of profit (ARP) for what had been previously known in the literature as ARR. He later compounded this change by using ARR for a different concept (Kay and Mayer 1986).

3 Another contribution in a similar vein was by Peasnell (1982). This uses discrete, rather than continuous, mathematics and uses examples more attuned to the language of accountants, to whom it is addressed, but it uses a similar theoretical framework to that of Kay and derives some of the same results.

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SOME BASIC PROPERTIES OF ACCOUNTING RATIOS

Geoffrey Whittington*

Introduction

Almost every text-book on accounting has a section describing the use of accounting ratios in the interpretation of financial accounts or management accounting data. The discussion typically concentrates on the detailed definition of ratios and the relevance of alternative definitions to different uses rather than on the reasons for using ratios in preference to other statistical devices.[1] There is also a growing body of empirical literature which studies the statistical distributions of, inter-relationship between, and predictive content of accounting ratios,[2] but in this literature also, it is customary to assume that the ratio is the appropriate statistical form for summarising the data, without explaining what assumptions are necessary for this to be the case.

The object of this paper is to deal with the latter issue, and, in the process, to provide some insight into the assumptions, limitations and uses of accounting ratios. It is not claimed that anything which follows is original from the standpoint of the statistical literature, but this literature seems to be either ignored or taken as read in the accounting literature, with the result that readers and perhaps even authors are not always aware of the assumptions implicit in ratio analysis.

The Basic Assumption

The basic assumption of ratio analysis is that of *proportionality*, i.e. it is assumed that a proportionate relationship exists, or ought to exist, between the two variables whose ratio is calculated. Three such relationships are illustrated in Diagram 1. Each relationship is linear with no constant term. Line A represents a ratio of 2:1, line B represents a ratio of 1:1, and C represents a ratio of 1:2. The ratio is, of course, the tangent of the angle which the line bears to the horizontal axis.

One traditional use of ratios by accountants is to compare a ratio with some standard to say whether it is high or low. Thus, if Y represents a measure of current assets and X a

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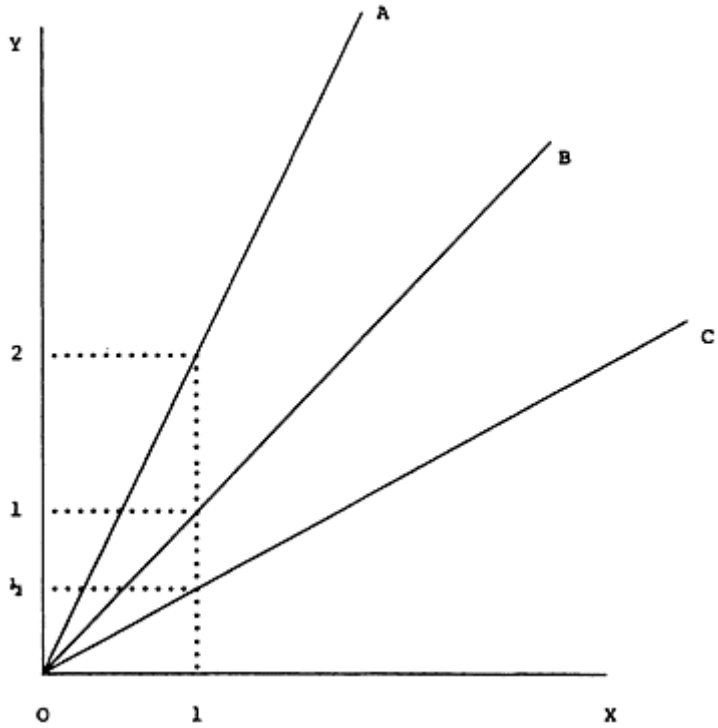
DIAGRAM 1

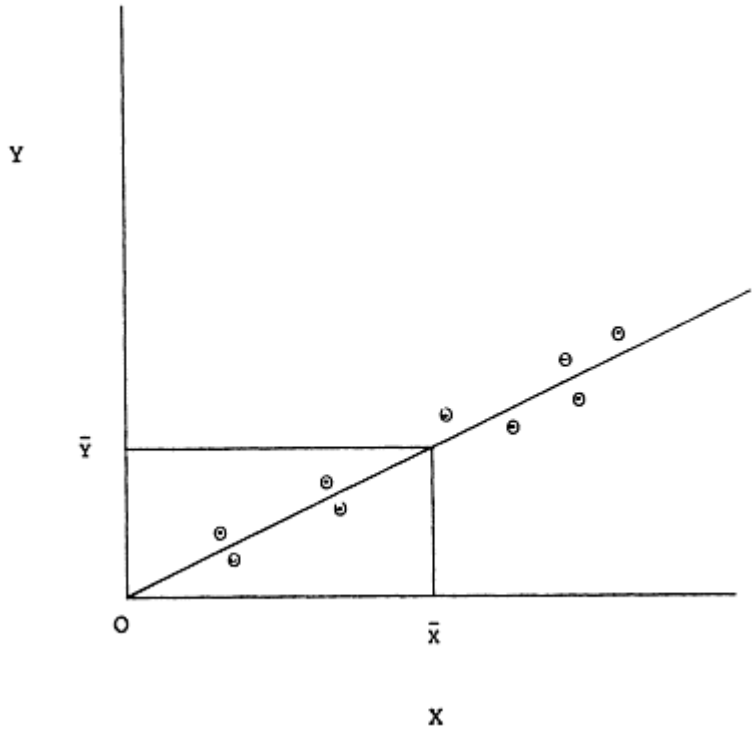


measure of current liabilities, the ratio Y/X is a measure of liquidity. If a ratio of one is set, represented by B, as the standard, A is regarded as high and C as low. (Traditional accounting folklore is, in fact, more cautious, two being a popular standard). This is the normative use of ratios, in which the ratio summarises the relationship between Y and X in a single number which can then be compared with a standard. The standard may have a theoretical foundation or it may be based on past experience of the firm being studied, or on a comparison with other firms. A pioneering empirical study relevant to the use of industry averages as norms for financial ratios is Lev (12), which studies the mean reverting properties of ratios across firms within particular industries. Lev's results could be taken as evidence that ratio standards are often based on comparisons with other firms in the industry.

There is, however, an alternative use of ratios, which has become increasingly common in relation to both financial accounting and management accounting data. This is the estimation of a functional relationship, usually for the purposes of prediction. For example, an investment analyst might seek to predict the future profits of a firm by estimating future sales and multiplying these by a ratio, the profit margin (i.e. the profit/sales ratio), to give a predicted profit figure. He might estimate the future dividend by multiplying his forecast profit figure by yet another ratio, the payout ratio.[3] Equally, cost accountants have traditionally used ratios to estimate the costs likely to be incurred by various activities.

This second use of ratios relies on the statistical properties of ratios for the purpose of estimating a functional relationship from sample data. In fact, the properties of ratios in this respect are quite powerful, provided that the relationship to be estimated is a proportionate one, i.e. a linear function with no constant term, as depicted in Diagram 1. In this situation, the relationship estimated by calculating a ratio will be the same as that obtained by regression analysis: a computationally more complex technique, which can be shown, on certain assumptions, to yield the best statistical estimate of a linear relationship.[4] This is illustrated in Diagram 2.

DIAGRAM 2



This diagram represents a series of joint observations of the variables Y and X, each observation being marked by a circled point. For example, Y might be Profits and X might be Sales. Each observation would then represent a joint observation of profits and sales for a particular period, if the data are a time series for an individual firm, or for a particular firm if the data are a cross-section of firms for a single time period. Estimation of the line of best fit by regress. ion analysis would result in the line passing through the point $\overline{YX}$ which represents the joint means of the two variables: this is a general property of regression analysis. Since, by assumption, there is no constant term in the relationship, the line would also pass through the origin, O. These two constraints are sufficient to describe fully the relationship which linear regression analysis will yield, since two points are sufficient to fix the direction of a straight line.

However, the calculation of the ratio $\bar{Y}/\bar{X}$ will also lead to the estimation of a line which will pass through both the origin and the joint mean $\bar{X}\bar{Y}$. Thus, in this special case of a linear proportionate relationship, the calculation of a simple ratio $\Sigma Y/\Sigma X$ will yield an identical result to the estimation of a regression coefficient.[5]

Alternative Functional Forms

In an empirical relationship between a pair of accounting variables, two of the conditions necessary for proportionality are quite likely to be violated. Firstly, there may be a constant term in a relationship, e.g. an element of a firm's profit may be unrelated to the sales element, so that the profit/sales ratio is not an adequate description of the relationship between profit and sales. Secondly, the functional form of the relationship may be non-linear.[6] Thus, for example, a firm which was experiencing decreasing returns to scale, or which was facing a saturated market, might not be expected to yield a constant increment to profit for each £ added to sales: again the profit/sales ratio would not be an adequate description of the relationship between profit and sales.

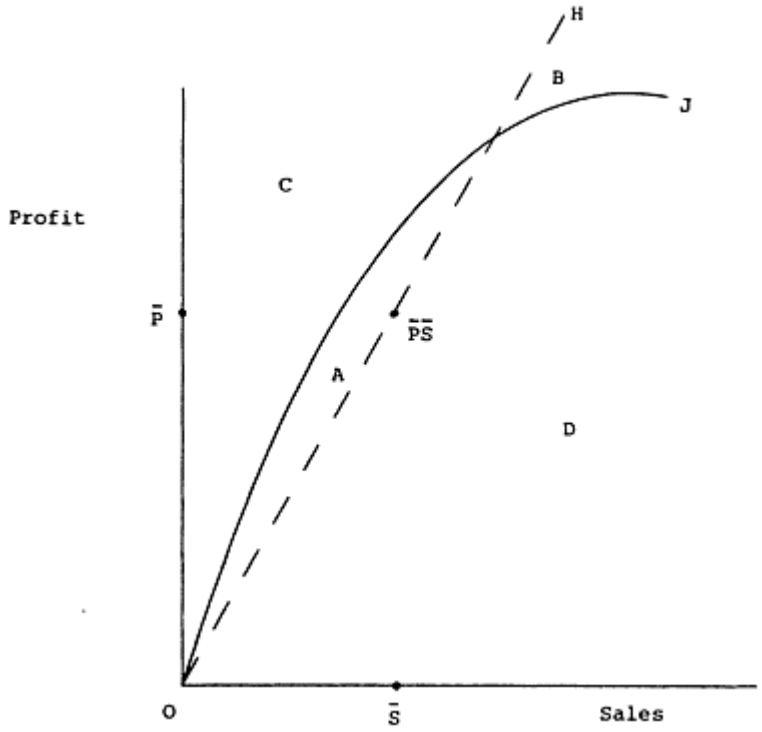
If these two conditions are violated, regression analysis provides a much more powerful and flexible means of estimating the functional relationship between a pair of variables. Historically, the use of regression analysis was impeded by the relative complexity of the calculations involved, but now that computer science has developed to a stage where pocket calculators can perform regression analysis, this is no longer a serious objection. Moreover, the relatively complicated calculations of regression analysis produce, as a by-product, a number of valuable statistics (such as the correlation coefficient and the standard errors of the estimated regression coefficients) which enable us to test hypotheses and attach confidence intervals to the estimates. A further advantage of regression analysis in the estimation of relationships between variables is that it can incorporate multiple explanatory variables.[7]

Thus, it seems that, for estimating empirical relationships from sample data, regression analysis should be used in preference to ratio analysis, except in cases where there are strong grounds for assuming proportionality, or when a very "rough and ready" preliminary survey is being made. However, it is less clear that ratios are inadequate for the primary purpose attributed to them earlier: the assessment of performance. For example, in assessing performance in terms of profitability, a standard may be set for the accounting rate of return, the ratio of a Profit measure to an Asset measure (ignoring here the well-known deficiencies of conventional ex post accounting data for the assessment of economic performance). If a company's rate of return is higher than this standard, the assets employed are said to be used profitably, if the rate of return is below the standard, the assets are used unprofitably. Profit per unit of assets employed is, by assumption, the standard employed, and it is a ratio, i.e. in this case proportionality seems to be the natural assumption for standard-setting purposes.

Even in the latter case, there is scope for dropping the proportionality assumption on occasion and using regression analysis for standard-setting. Suppose, for example, one is examining the gross profit margin, as measured from the financial accounts. A standard could be set for the Proft/Sales ratio and the observed ratio in relation to the standard assessed. On the other hand, it may be that high sales can be obtained only through

having a low profit margin. This would imply a non-linear relationship between profit and sales, of the type shown in Diagram 3, i.e. with incremental profit per £ of Sales declining as Sales increase.[8]

DIAGRAM 3



The stippled line OH represents a standard set by traditional ratio analysis. A common method of setting this standard would be to look at the average performance of other firms (in a cross-sectional comparison) or average past performance of the firm being studied (in a time series comparison): hence OH passes through the joint mean $\overline{\bar{P}\bar{S}}$. The continuous curved line OJ represents the empirical relationship between the two variables which might be estimated by regression analysis. Ratio analysis would classify any observation to the left of OH as a satisfactory performance, whereas regression analysis would classify anything to the left of OJ as satisfactory.[9] Areas A and B are those in which the two methods would give conflicting results: observations in area A would be rejected by a regression standard but accepted by a ratio standard, whereas the reverse would be true of observations in area B.

In this situation, if the actual performance of the other firms as an appropriate benchmark for comparison is accepted, the regression standard shows whether profitability is satisfactory for the level of sales at which the firm is operating.[10] Of course, the level of sales may not be one which is particularly good for profitability: there is therefore still scope for the ratio standard, which makes no concessions to such factors.

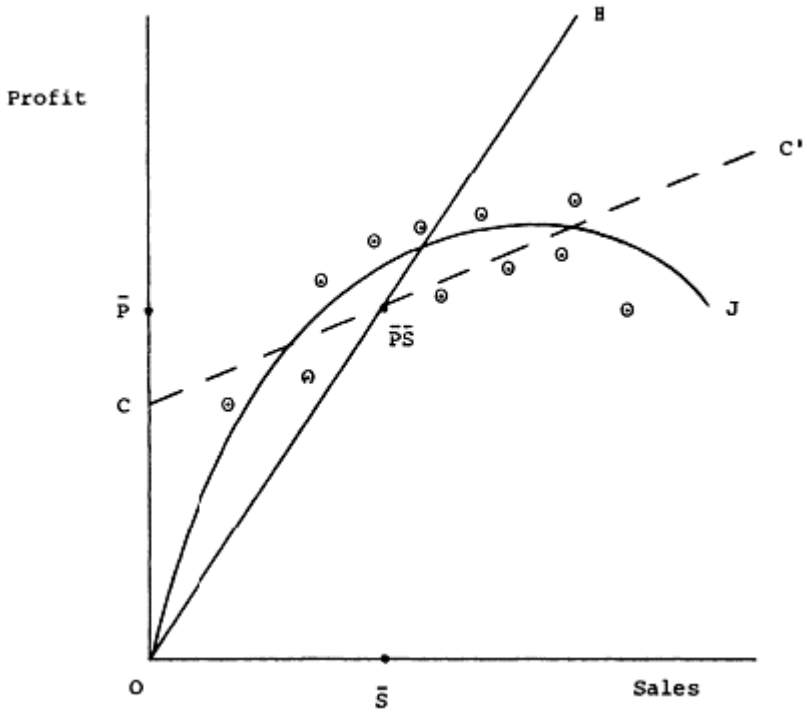
Thus, the two types of standard are complementary rather than competitive. They each attempt to answer an important but separate question.

The Role of the Constant Term

It was assumed for the purposes of Diagram 3 that there was no constant term in the estimated relationship. It was also assumed that the estimation process could be carried out in cross-section or time-series. The two assumptions are related, because the constant term could have a rather different interpretation in cross-section from that in time-series.[11] If sales were the only source of gross profits, it would be reasonable to assume that zero Sales would imply zero profits. However, it is possible that sources of income not related to Sales, such as rents received, might appear in the measured gross profit figures. In this case, in a time-series analysis for an individual firm, the estimated constant term would represent an estimate of the average amount of such sales-unrelated income for that firm. In cross-section, such an interpretation could not be placed on the constant term: it would now represent an estimate of the average amount of sales-unrelated income for the average firm, provided the further assumption is made that "sales-unrelated income" is strictly independent of sales, i.e. has a zero covariance with sales, across firms. If a crosssectional estimate including a constant term were used as a standard for comparison, the risk would be run that an individual firm would be judged apparently on its Profit/Sales performance but in fact on its sales-unrelated income: a firm with above-average sales-unrelated income would always appear to be doing relatively well, and vice versa. In time series, the years when salesunrelated income was high would always appear to be years of relatively good performance and vice versa, but this is unlikely to be such a serious problem, since variables such as sales-unrelated income are likely to vary more across firms within years than across years within firms.

Although the Profit/Sales relationship has been used for illustrative purposes, the problem of interpreting the constant term in cross-section and in time-series is a general one. The problem is compounded by the fact that the constant term often acts as a "catch all" term which partly reflects specification errors. For example, suppose that the curved line OJ in Diagram 3 represented the true relationship between the variables, i.e. the true constant term is zero. Now assume that, because of ignorance or limited computing capacity, it is wished to estimate only a linear relationship. If a constant term is put in the relationship, a better approximation to the true relationship across the observed data (reflected in a higher $\bar{R}^2$ and a statistically significant estimated value of the constant term in regression analysis) will be obtained than if a ratio estimate had been used. This is illustrated in Diagram 4.

DIAGRAM 4



OJ represents the true relationship, OH represents the ratio estimate, and CC′ represents a linear regression estimate which includes a constant term OC. The constant term serves the purpose of enabling the line CC′ to move to a height where it fits the observed data (represented by circled points) better. It does not serve the purpose of providing a good estimate of the profit which would typically be earned by a firm which had zero sales, but this is unimportant because extremely low, or zero, levels of sales never actually occur.

This does, however, illustrate one serious limitation of regression estimates, or indeed of any other estimates based on sample data: the estimates are valid only over the ranges of the explanatory variables actually observed. Extrapolation of the relationship outside this range is a matter of assumption and has no basis in the estimation process. However, this applies equally to ratio estimates: in fact, in the case illustrated, the ratio OH is accurate at a zero value of Sales but is less accurate than the constant term estimate CC′ at very high levels of sales, which are more likely to be of practical importance.

At this point it is appropriate to point out that the thoughtful use of regression analysis to estimate relationships, whether for ex post appraisal or for forecasting purposes, will lead to further problems.[12] For example, in the time series case, a more sophisticated analysis would drop the “snapshot” assumption implicit in the ratio approach and allow for time lags, and this in turn might raise estimation problems arising from auto-correlation in the error term. One might also wish to allow explicitly for time trends, or for the effects of inflation, and there might also be problems arising from changes in the

underlying structural relationships, e.g. when a firm merges with another. However, all these problems are common to the ratio approach as well as the regression approach. Both approaches are obviously less sophisticated than econometric model-building. On the other hand, they are simpler and more flexible than the latter approach: they allow scope for the user of information to add his own adjustments based on intuition and judgment.

Ratios as a Method of Deflation

One common reason for using ratios, which has not been explicitly discussed so far, is as a method of reducing variables to similar scale. The most obvious example of this is in comparing firms of different sizes. In such a case, one might wish to compare an attribute across firms whilst ignoring the effect of the Rate of Return, rather than the absolute amount of profit, for inter-firm comparison. Another example is the use of growth *rates* rather than absolute amounts of growth. In both of these cases, the denominator acts as a size deflator, to remove the effects of scale from the comparison. Ratios are an appropriate tool for this purpose, provided that it is appropriate to assume a linear proportionate relationship between the size measure (the denominator) and the variable being compared (the numerator).

Ratios of this type are often used as variables in a regression analysis estimating the relationship between variables such as Profitability and Growth, (e.g. Singh and Whittington, (16)) in which case, the cross-sectional regression equation might be of the form:

$$G_{it} = a + b.R_{it} + \epsilon_{it}$$

Where: a, b are regression coefficients

ϵ is the stochastic error term
i denotes an individual firm
t is a time subscript representing an accounting period
G is Growth Rate, defined as $\frac{\Delta A}{A}$, where A is a measure of Asset size
R is a Rate of Return, defined as $\frac{P}{A}$

If this relationship is multiplied through by the size measure, A, the result is;

$$\Delta A_{it} = a.A_{it} + b.P_{it} + A_{it} \cdot \epsilon_{it}$$

If the mean of ϵ and its covariance with A are assumed to be zero, one might wonder why it is necessary to calculate ratios, rather than estimating the second, undeflated, relationship. The answer lies in the problem of heteroscedasticity, i.e. the variance of $A_{it} \cdot \epsilon_{it}$ may not be independent of explanatory variable A_{it}. The estimation properties of

the first equation are superior provided that the variance of the stochastic error $(A_{it} \cdot \epsilon_{it})$ in absolute Growth (ΔA_{it}) is proportionate to size (A_{it}) in a ratio relationship: the effect of dividing by Size is then to remove the excessive weight given to the larger error variance of large firms. The removal of heteroscedasticity is a major reason for using ratios in econometric work. A well-known example in the area of finance is the share valuation model of the type estimated by Fisher (6).

There are problems in using ratios in this manner. It has long been known that the division of two uncorrelated variables by a third variable can lead to a spurious correlation between the resulting ratios (Pearson, (14)). The latter relationship is spurious in the sense that it does not reflect the true correlation between the numerators of the two variables: if the complete ratios are the variables of central interest, the correlation would not be regarded as being spurious. This problem is discussed in the context of economic variables in Kuh and Meyer (11). However, even in the latter situation, the correlation of ratios can lead to biased results if the component which is common to both ratios is subject to measurement error (Briggs, (3) and (4)). Both of these problems can arise in correlations where the variables being correlated have a common component: it is not necessary for the common component to be the denominator of both variables or for both variables to be in ratio form, i.e. X/Z could be correlated with Y/Z, with Z/Y or with Z and similar problems would arise, although the bias would vary in extent and direction in each case. Some special problems in interpreting the correlations between X/Y and Y and between X/Y and X, when the two might lead to contradictory results for purely statistical reasons, were explored by Johnston (9).

Thus, the statistical properties of ratios are not unambiguously desirable if it is desired to correlate two ratios with a common component. It is therefore important to establish the motive for using ratios, i.e. whether it is a matter of pure deflation or whether the true specification of the variable of central interest is in the form of a ratio. In the former case, the advantages of deflation (e.g. possible elimination or reduction of heteroscedasticity in a regression analysis) should be weighed against the risk of introducing biases due to the correlation of ratio variables which have a common component. In the case where the variables of central interest are of a ratio form, it is still important to consider the extent to which bias might result from errors of measurement in any component which is common to variables being correlated.

Some Suggestions for Empirical Testing

Two uses of ratios have been identified. The normative use is for the measurement of performance in relation to a standard, and the positive use is in estimating empirical relationships for forecasting purposes. It was argued that, in some circumstances, regression analysis could be a more appropriate analytical tool for either purpose. In particular, regression analysis is not constrained to the estimation of a linear relationship passing through the origin. Ratios also have a special use for size deflation purposes in certain situations, although this may lead to statistical bias in correlation analysis, in some circumstances. Whether these matters are of practical importance must be determined by empirical testing.

The most obvious area of empirical research to emerge from the earlier discussion is to compare ratio estimates with regression estimates for certain relationships to which ratios are commonly applied, in order to establish whether there are statistically significant deviations from the linear proportionate relationship assumed by ratio analysis. An appropriate starting point would be to explore profitability ratios, which are probably the most widely used accounting ratios. Some preliminary empirical work of this type is reported in the next section. A second, but related, area for empirical research is the use of ratios for size deflation. This arises naturally out of the first area of study. For example, it is likely that the relationship between Profit and Sales will be affected by heteroscedasticity, which may possibly be dealt with by some form of ratio deflation. A particularly interesting problem requiring further investigation is the relationship between Size and Profitability. This raises the estimation problem explored by Johnston (9).

A third area, which is again related to the first, is to consider whether conventional ratios can be adapted to yield more useful estimates. For example, promising results have been obtained from the cross-sectional comparison of liquidity ratios by eliminating the average value (estimated from a historic time series) for each individual company (Whittington (20)). This type of approach could be used to give an approximate method of allowing a constant term to enter into the ratio calculation for the individual company. Another approach might be to use difference estimates as an alternative to ratios where it is desired to describe a relationship between two variables and it is expected that there is a non-zero constant term in the true relationship.

Some Illustrative Results

As a preliminary step towards a programme of empirical work, the following simple empirical test was carried out, using accounting data for United Kingdom quoted companies contained in the Edinburgh/Cambridge data bank, for the period 1960–74.[13] Cross-sectional regression analysis was carried out, to decompose firstly the rate of return on net assets (by regressing pre-tax profits on net assets) and secondly the ratio of operating profit to sales (by regressing operating profit on sales). In each case, three separate functional forms were estimated: firstly, the simple proportionate relationship consistent with ratio analysis (see note (5) and diagram 1); secondly, a linear relationship with a constant term (as in diagram 2); and thirdly, a quadratic term was added (as in note (7)) to test a very simple form of non-linear relationship.

The results of estimating the proportionate relationships showed a high degree of association (indicated by $\bar{R}^2$ in the regression, which was greater than 0.7 in each case, and a high value of the 't' statistic associated with the estimated coefficient) in each case. Adding a constant term usually yielded a statistically significant (at the customary five per cent level) estimate[14], which suggested that the ratio specification was inappropriate. Adding the quadratic term yielded a significant coefficient attaching to this term, which suggested that a quadratic specification was superior to either of the linear ones[15], but the introduction of the quadratic term led to the constant term losing its statistical significance. This suggests that the constant term in the linear case was performing the rôle described in diagram 4 above.

It might seem from these results that, in both instances, the ratio specification should be rejected in favour of a quadratic relationship. However, there are four important qualifications to this:

(1) The difference between the ratio estimate and the quadratic form was not always important quantitatively, despite its statistical significance. This was particularly true of the profits/net assets case.
(2) Estimation across different periods and across separate sub-populations for individual industries suggested that neither of the two more elaborate forms was very stable over time or across different populations, e.g. the sign attaching to the quadratic term was not always the same.
(3) Tests on the residual variance from the regressions suggested that this was heteroscedastic, increasing with the size of the explanatory variable. This was to be expected: it has already been explained in the section on Ratios as a Method of Deflation above that the removal of heteroscedasticity is one common motive for using the ratio form.[16] However, the presence of heteroscedasticity means that the standard errors of the coefficients are biased downwards, so that the results of the t-test are unreliable.
(4) It is quite possible that the explanatory variables (net assets in the first case, and sales in the second) are subject to measurement error. In this case, there is an "errors in variables" problem, and the regression coefficient estimates are biased.

Conclusion

The empirical results described above are illustrative rather than decisive, but they demonstrate that there is important work to be done in testing empirically the appropriateness of the assumptions of ratio analysis. Of course, this is not to say that ratio analysis must stand or fall by empirical testing alone: the discussion earlier in the paper explained that there is an important normative rôle for ratios, irrespective of their validity as estimates of empirical functional relationships. However, that discussion also examined the basic assumptions of ratios which should be consistent with the objectives of any use to which they are put, including normative uses.

NOTES

[1] An honourable exception is Ramamoorthy, Ch. 4 (15), which describes very clearly the difference between a ratio approach and a regression approach to forecasting. Notable pioneering work on financial ratios has been that by Horrigan (7) and (8).

[2] An active area of empirical research in recent years has been the value of ratios in predicting company failure, e.g. Beaver (1). A recent study of this type is Walker, Stowe and Moriarty (18). A study which concentrates on the comparison of distributions of ratios for different periods and industries, is Bird and McHugh (2). A useful taxonomy of ratios and survey of empirical studies which use them is provided by Courtis (5).

[3] This example is, of course, extremely simplistic, ignoring many of the factors taken into account by practising investment analysts. For an example of a more sophisticated approach see Weaver (19).

[4] The assumptions necessary for regression analysis to yield the Best Linear Unbiased Estimate, and the precise implications of this property, are spelled out in any good statistics or econometrics text-book, such as that by Wonnacott and Wonnacott (21). A troublesome problem in the use of accounting data is likely to be that of "errors in variables", i.e. the explanatory variable may be subject to measurement error.

[5] It is a simple matter to demonstrate this algebraically. The least squares regression estimates of the constant term $\hat{\alpha}$ and the regression coefficient, $\hat{\beta}$ are related as follows:

$$\hat{\alpha} = \bar{Y} - \hat{\beta}\,\bar{X}$$

where $\bar{Y}$ is the mean of the explanatory variable and $\bar{X}$ the mean of the dependent variable. Setting $\hat{\alpha} = O$, then

$$\hat{\beta} = \frac{\bar{Y}}{\bar{X}} = \frac{\sum_{i=o}^{n} Y_i/n}{\sum_{i=o}^{n} X_i/n}$$

Note, however, that it is important to calculate the ratio of the average rather than the average of the ratios, since in general:

$$\frac{\sum_{i=o}^{n} Y_i/n}{\sum_{i=o}^{n} Y_i/n} \neq \frac{\sum_{i=o}^{n} (Y/X)_i}{n}$$

[6] This paper will consider only non-linearity in the variables. Non-linearity in the parameters, which may occur in relationships with multiple explanatory variables, causes regression analysis to break down, and iterative methods of estimation have to be used.

[7] The estimation of non-linear relationships often takes the form of a multiple regression equation, e.g. one might estimate the quadratic relationship:

$$Y = a + b.X + c.X^2 + \epsilon$$

where a, b, c are parameters

ϵ is the stochastic error term

Y, X are variables

In this case, the multiple explanatory variables are X and X.

[8] It should be emphasised that this is a very simple form of non-linear relationship, and that an infinite range of more complicated alternatives is possible.

[9] A similar analysis in the context of evaluating share prices in terms of earnings will be found in Weaver (19). An audit application, using Deloitte, Haskins and Sells' STAR program is described by Stewart (17).

[10] There are, however, some dificult statistical problems which might arise. For an example of how regression analysis can be applied to the estimation of cost functions see Johnston (10).

[11] It should also be noted that the regression coefficient (ie. the slope coefficient) is likely, in practice, to be different in cross-section and in time-series: it is unlikely that the same structural relationship will hold both across all firms during one time period and for the same firm across different time periods.

12 Unless one is merely interested in naive statistical forecasting, which involves finding the set of variables which gives the best fit (highest R^2) to past data, rather than giving an accurate estimate of the causal relationships between the variables.

[13] The data are described in Meeks and Whittington (13). There were 735 companies in the population for the period 1960–74.

[14] The constant term was positive in the case of the profits/net assets relationship and negative in the case of the operating profit/sales relationship.

[15] The coefficient of the quadratic term was negative in the profits/net assets case (suggesting a downward curve as in diagrams 3 and 4) and positive in the operating profit/sales case (suggesting upward curvature).

[16] In the case of rate of return on net assets, previous work by the present author (e.g. Singh and Whittington (16), suggests that the ratio involves an over-correction, since the variance of the rate of return declines with company size (measured as net assets).

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The Components of Accounting Ratios as Co-integrated Variables

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1. INTRODUCTION

We concluded an earlier empirical study of accounting ratios (Tippett and Whittington, 1995) with the conjecture that the relationship between the numerator and the denominator of an accounting ratio might be one of co-integration, when the variables are expressed in logarithms. If this were the case, accounting ratios could be interpreted as a means of eliminating non-stationarity from accounting variables. Since stationarity is a desirable statistical property in time series analysis, such a result might add to the established list of reasons for choosing the ratio form for the statistical analysis of accounting variables (as discussed, for example, in Lev and Sunder, 1979; Whittington, 1980; Barnes, 1987; and Tippett, 1990).

Non-stationarity is a problem of time series models rather than cross-sectional models. Such models are being used increasingly in empirical accounting research, and researchers are generally aware of the associated dangers of non-stationarity (e.g. O'Hanlon, 1996; and Myers, 1999). These dangers, which involve misleading results for the standard regression model and its associated tests,

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can often be avoided by differencing the data, at some loss of information, or by the more elaborate process of establishing a cointegrating relationship between two time series. The conjecture tested in this paper is that the relatively simple computation of a traditional accounting ratio in logarithmic form may capture a cointegrating relationship which results in the ratio having the desirable statistical property of stationarity, even when its components (the numerator and the denominator) are non-stationary. We test the co-integration conjecture using the same variables and same data source as in Tippett and Whittington (1995), but with the advantage of an additional five annual observations in each time series.

The paper proceeds as follows. In the next section we discuss stationarity, non-stationarity and co-integration: this makes no claim to originality, other than as an introduction to applying the concepts to accounting ratios. In later sections, we describe the testing strategy and the data, and the results are then presented and discussed. In a concluding section, we discuss the significance of our results for the use of accounting ratios, and for our previous study.

2. NON-STATIONARITY AND CO-INTEGRATION

In the past two decades, econometricians have become aware of the problems of estimating time series relationships when the variables concerned are non-stationary. In such circumstances, the standard diagnostic tests of ordinary least squares regression analysis may yield misleading results (Nelson and Plosser, 1982).[1]

A *stationary* variable is one whose value is not permanently affected by the error terms contained in previous observations. A simple example of a stationary process is a so-called 'white noise' process:

$$y_t=\varepsilon_t \tag{1}$$

where t is an index of time, y is the dependent variable and ε is a serially uncorrelated random variable with zero mean and constant variance $\text{var}(\varepsilon_t)=\sigma^2$. It may be stationary about a time trend in which case we have:

$$y_t=\beta_t+\varepsilon_t \tag{2}$$

where β is the coefficient which characterises the trend in time. In both the above cases y_t is independent of the values, ε_{t-1}, ε_{t-2}, ε_{t-3},——, in earlier periods.

A *non-stationary* variable is one whose current value is permanently affected by the error terms contained in previous observations. The classic example is the random walk:

$$y_t = y_{t-1} + \varepsilon_t. \tag{3}$$

Note that this process also implies $y_{t-1}=y_{t-2}+\varepsilon_{t-1}$ and so, recursive substitution shows that y_t may be re-stated as:

$$y_t = y_{t-n} + \sum_{j=0}^{n-1} \varepsilon_{t-j} \tag{4}$$

where y_{t-n} is the 'initial condition' or value at which the process started n periods ago. This clearly shows the cumulative effect of the error terms leading to the non-stationarity in y_t. It is this accumulation of error terms which creates difficulties in using regression analysis to relate non-stationary variables.

We can also add a 'drift' term to (3) to allow for a tendency for the variable to rise (or, if it is negative, decline):

$$y_t = \mu + y_{t-1} + \varepsilon_t \tag{5}$$

where μ is the drift factor. This stochastic drift is different in nature from the deterministic trend in (2) above, because its past values influence y_t through their influence on y_{t-1} rather than directly.

The simple models considered in (1) and (3) above are a special case of the more general stochastic process:

$$y_t = \alpha y_{t-1} + \varepsilon_t \tag{6}$$

where α is sometimes known as a 'speed of adjustment' coefficient.

If $0 \geq \alpha < 1$, the process is stationary, and
if $\alpha \geq 1$, the process is non-stationary.

In the pure 'white noise' example (1), $\alpha=0$. When $\alpha=1$ as in (3), the series is described as integrated of order one, or I(1), because differencing it once renders the series stationary:

$$y_t - y_{t-1} = \varepsilon_t. \tag{7}$$

Thus a test for integration of order one is to estimate (7) with an additional y_{t-1} term on the right hand side only. If we are unable to reject the hypothesis that the coefficient on this additional explanatory variable (y_{t-1}) is zero, then (7) (the unit root specification) cannot be rejected. This is the basic structure of the Dickey-Fuller regressions estimated later in the paper.

However, when $0<|\alpha|<1$, the time series is stationary before differencing, because the effect of past errors is not permanent. In this case, recursive substitution shows that (6) becomes:

$$y_t = \alpha^n y_{t-n} + \sum_{j=0}^{n-1} \alpha^j \varepsilon_{t-j}. \tag{8}$$

As $n\to\infty$, so $\alpha^n\to 0$, and the effect of past errors dies out rather than accumulating, as in an integrated series. Now, it is conventional practice to assume that the error term, ε_t is serially uncorrelated with a mean of zero and constant variance, $\mathrm{Var}(\varepsilon_t)=\sigma^2$. It then follows that the variance of y_t will be:

$$\mathrm{Var}\left(\sum_{j=0}^{\infty} \alpha^j \varepsilon_{t-j}\right) = \sigma^2 \sum_{j=0}^{\infty} \alpha^{2j} = \frac{\sigma^2}{1-\alpha^2}$$ (Cox and Miller, 1965, p. 279).

Note that the variance converges if $0<\alpha<1$, but diverges if $\alpha\geq 1$. In the case of economic variables it is commonly assumed that higher orders of integration ($\alpha>1$) are rare, especially when (as in the present study) the variables are expressed in logarithmic form, because they lead to potentially explosive behaviour,[2] but $\alpha=1$, as in the random walk model, is considered to be quite common. Thus, it is customary to test for first order integration, 1(1), with that as the maintained hypothesis, i.e. we test the hypothesis of $\alpha<1$, with $\alpha=1$ as the null hypothesis. Thus the standard statistical tests (such as that of Dickey and Fuller, 1979) place the burden of proof on rejecting the null hypothesis of non-stationarity.

If non-stationarity of the 1(1) variety is found to exist, an obvious method of removing it (and avoiding the associated econometric pathology as explained, for example, by Nelson and Kang 1984) for the purposes of time series analysis is to difference the data. First differences of an 1(1) series are stationary. However, an alternative approach which uses the information available in absolute values rather than differences is possible where two variables are co-integrated (Engle and Granger, 1987). Co-integration can arise when there is a relationship between two variables such that they cannot drift widely apart. The specific condition for a co-integrated relationship is that the residual from the regression of one of the variables on the other is itself stationary. In such a case, the presence of both

variablesin a time series regression will avoid the problems associated with the non-stationarity of one of them.[3]

The implication of co-integration for accounting ratios, as suggested by Tippett and Whittington (1995), follows directly from this. Accounting ratios are commonly believed to be comprised of variables which are related in such a way that they cannot drift too widely apart. Lev and Sunder (1979) and Whittington (1980) have characterised ratios as assuming a linear proportionate (i.e. with no constant term) relationship between the numerator *(y)* and the denominator *(x)*. If this is a correct specification of the relationship, it seems possible that variations in the value of the ratio can be expected to have similar properties to the residuals from a co-integrating regression. This characterisation of ratios is particularly appropriate when the variables are expressed in logarithmic form, so that the ratio can be expressed as a difference of logarithms (see equations (11) and (14) below). In these circumstances it is possible that a ratio, *r*, will be stationary even if its numerator *y* and its denominator *x* are non-stationary. If this were the case, it would reinforce the statistical case for using ratios rather than the raw values of accounting variables, in time series analysis, because ratios would be free of the problems caused by non-stationarity.

It should also be noted that a consequence of co-integration is that the Granger Representation Theorem (Engle and Granger, 1987) asserts, *inter alia*, that there is an error correction representation of each co-integrated relationship, i.e. changes in the dependent variable are determined, at least in part, by the past difference between the levels of the two co-integrated variables. This error correction (ECM) model arises naturally out of the assumption of an equilibrium relationship between the two variables and is, of course, consistent with the assumption that a ratio has some normal (or equilibrium) value to which it will tend. The assumption that such a value exists lies behind many of the common uses of ratios (Whittington, 1980). If the value of a ratio is different from its perceived equilibrium level (e.g. if the rate of return on net assets is exceptionally high), we might expect the components of the ratio to adjust towards the equilibrium level (e.g. profits might be expected to fall to yield a more normal return).

The elastic random walk model, investigated in Tippett and Whittington (1995) is a simple form of ECM expressed in terms of the logarithms of the components of ratios. This model was derived from an earlier paper by Tippett (1990) which outlines several processes which are special cases of the co-integrating model of ratios defined by equation (11) below. His analysis is developed primarily in terms of balance sheet variables so that both the ratio and its component values are strictly non-negative. One such model (Tippett, 1990, pp. 77–79) assumes that the components of the ratio are generated by Geometric Brownian Motions in which case the ratio itself evolves in terms of the following process:

$$r_t = r_0 \exp\left[\left(\eta - \frac{1}{2}\omega^2\right)t + W_t\right]$$

where r_t is the value of the ratio at time t, W_t is normally distributed with zero mean and variance $\omega^2 t$, η is a 'drift' parameter and exp(·) is the exponential operator. Now, if we let $r_t = \frac{y_t}{x_t}$ be the components of the ratio, then a little algebra shows that this result implies:

$$\log(y_t) - \log(x_t) = \left(\eta - \frac{1}{2}\omega^2\right) + \log(y_{t-1}) - \log(x_{t-1}) + (W_t - W_{t-1}).$$

Hence since $\left(\eta - \frac{1}{2}\omega^2\right)$ is a constant, and $W_t - W_{t-1}$ has a mean of zero and a constant variance, it follows that the Tippett (1990, pp. 77–79) model is a special case of the more general cointegrating relationship considered in equation (11) below. Similar conclusions also apply to the other models examined by Tippett (1990). This provides one theoretical setting in which it is necessary for tests of the co-integrating relationship to be based on the logarithm of the components of the ratio rather than the 'raw' values themselves.

Error correction models have also been proposed as a characterisation of the time series behaviour of rates of return (Freeman, Ohlson and Penman, 1982, using US data, and Butler, Holland and Tippett, 1994, using UK data. O'Hanlon, 1996, tests the components of clean surplus income for stationarity, but not for co-integration). The previous discussion suggests that it will in general be necessary to apply some form of transformation, such as conversion to logarithms, to the components of the ratio if they are to be stated in a form which is suitable for the application of the standard co-integrating tests. However, Tippett (1990, pp. 82–84) and Rhys and Tippett (1993) show that for equity or profitability ratios it is unclear what form this transformation ought to take. Until this issue is resolved there is considerable danger in testing for co-integrating relationships based on profitability ratios since there is every chance they will be based on mis-specified regression procedures. Thus, we choose to base our co-integration analysis on balance sheet items alone.

It is, of course, possible that the numerator and the denominator of a ratio are co-integrated variables, but that the co-integration relationship does not take the precise linear proportionate form assumed by ratios, i.e. there may be a constant term in the relationship. If this were the case, then the ratio adjustment would not properly capture the form of the co-integration and it would be necessary to include the separate values of the two variables in a regression analysis, in order to achieve the benefits of co-integration. Our empirical tests will explore this possibility by testing for co-integration between the numerator and the denominator of the selected accounting ratios.

3. TESTING STRATEGY

The subsequent empirical tests are based on time series analysis at the level of the individual firm, using the data described in the following section. As indicated earlier, the variables were measured in logarithmic form, consistent with our previous work and with the specification of the ratio relationship in (11) below.

Three basic empirical questions arise from the earlier discussion:

1. Are accounting variables stationary or non-stationary?
2. Are accounting ratios stationary or non-stationary?
3. Are pairs of accounting variables that are selected as numerator and denominator of the same ratio co-integrated?

The first question will be answered by means of the conventional Dickey-Fuller (DF) or Augmented Dickey-Fuller (ADF) test, the latter being relevant when an autoregressive lag appears to be appropriate in the DF regression. In its simplest form, the DF test is of the hypothesis $\alpha=1$ in the first order autoregressive regression equation:

$$y_t=\beta+\alpha y_{t-1}+u_t \tag{9}$$

where y is the time series variable, a and β are coefficients, and u is the error term.

The DF test tells us whether we can reject the hypothesis at the chosen level of significance (usually 5 per cent) and thus the test favours acceptance of the null hypothesis of non-stationarity ($\alpha=1$). The test is also carried out on two variants of the specification. First, a deterministic time trend is added, thus testing the hypothesis of non-stationarity about a trend. Second, the autoregressive structure is extended to test whether the addition of further lagged values of y improves the explanatory power of the model. In the latter case, the Augmented Dickey-Fuller (ADF) test is appropriate. In the present study, the maximum autoregressive lag (order of augmentation) tested was 3 (i.e. y_{t-4} featured in the equation): this was the maximum considered appropriate, given the trade-off between lengthening the lag and reducing the number of usable observations of the dependent variable.

The second question will be answered by a similar process of DF and ADF testing applied to accounting ratios rather than accounting variables. We define a ratio r_t as y_t/x_t. Since all of our variables were (following the Tippett and Whittington, 1995 study) measured in logarithmic form, $\log r_t=\log y_t-\log x_t$. Thus, (9) above becomes:

$$\log r_t=\beta+\alpha\log r_{t-1}+u_t \tag{10}$$

Or $\log y_t - \log x_t = \beta + \alpha(\log y_{t-1} - \log x_{t-1}) + u_t$. (11)

This shows clearly how the logarithms of the components of the ratio can be characterised as having a co-integrating relationship, if (9) was non-stationary and (10) was stationary. The use of logarithms is essential to achieve the linear characterisation of the ratio as in a co-integrating relationship (11).

The third question, that of co-integration between the variables forming the ratio, will be answered by estimating the standard co-integrating regression between the variables, rather than forcing the coefficients to be+1 (on *y*) and −1 (on *x*) as was the case in the previous analysis:

$$\log y_t = \hat{\gamma} + \hat{\delta} \log x_t + \hat{e}_t \tag{12}$$

where $\hat{\gamma}$ and $\hat{\delta}$ are estimated parameters and $\hat{e}_t$ is the estimated residual.

The estimated values of the residual $\hat{e}_t$ are then subject to a DF or ADF test, as appropriate:[4]

$$\hat{e}_t = \beta + \alpha \hat{e}_{t-1} + u_t \tag{13}$$

$$\text{or } \log y_t - \hat{\gamma} - \hat{\delta} \log x_t = \beta + \alpha(\log y_{t-1} - \hat{\gamma} - \hat{\delta} \log x_{t-1}) + u_t. \tag{14}$$

It can be seen that (14) is equivalent to (11) but with the relationship between log *y* and log *x* estimated from the data rather than determined by the prior ratio assumption. If $\hat{\gamma} \neq 0$ and $\hat{\delta} \neq 1$, the conventional ratio relationship does not capture the co-integrating relationship between the variables.

4. THE DATA

The data used in this study are accounting variables taken from the published balance sheets of companies listed on the London Stock Exchange. The secondary source from which they are taken is the Cambridge/DTI Databank (described in Meeks, Wheeler and

Whittington, 1991 and 1998). The same source was used by Tippett and Whittington (1995), but the present study had available an additional 5 annual observations for each company, there being 43 annual observations in all (for the years 1948 to 1990 inclusive). In order to obtain continuous and comparable time series, the companies studied are those which remained members of the population surveyed by the data bank for the entire period. This leads to both a size bias and a survivorship bias, so that the companies studied cannot be regarded as representative of the listed company sector as a whole. In all 118 companies survived over the period as members of the population, but this number was reduced to 111 by the need to remove seven companies which had negative or zero observations on one of the variables studied.[5]

The variables and ratios studied were those used in Tippett and Whittington (1995) and discussed and defined more precisely there:

Variables (6):

Current Liabilities (CL)
Total Assets (TA)
Liquid Assets (LA)
Current Assets (CA)
Stocks (S)
Total Liabilities (D)

Ratios (4):

Liquidity Ratio (LA/CL)
Current Asset Ratio (CA/CL)
Stock Ratio (S/CL)
Debt Ratio (D/TA)

Each ratio was calculated for each company *i* for each year *t*.

The variables and ratios are all derived from balance sheets and all have positive values, so that they can be transformed into logarithms. All of the subsequent analysis (apart from the descriptive statistics in Table 1) is carried out on the logarithmic transformation of the variables and ratios. This is consistent with the earlier study by Tippett and Whittington (1995) and also enables us to compare directly the properties of ratios with those of more general co-integrating regressions ((11) and (14) above).

There is a *prima facie* case for assuming that *all* accounting variables are non-stationary when measured (as in this study) over annual intervals, because they will, at least in part, reflect changes in the size of the firm, a property which carries over from the end of one period to the beginning of the next. It might be the case that balance sheet

variables are more likely to be non-stationary than profit and loss account or other flow variables (such as cash flow). The balance sheet contains accumulated balances which carry forward to future periods, whereas flow variables measure change rather like first differences. Indeed, clean surplus income can be interpreted as the first difference of shareholders' funds in the balance sheet, if we exclude capital contributions and withdrawals. However, this view has to be tempered by three *caveats*. First, balance sheet items do not necessarily accumulate permanently, and this is especially true of current items, which are the main focus of the variables selected for study (the exceptions being long-term liabilities and fixed assets, which are components of total liabilities and total assets respectively). Second, some profit and loss account charges will be determined by amounts in the balance sheet. Notably, in the case of fixed assets, depreciation charges in the profit and loss account will depend upon the amount of fixed assets in the opening balance sheet. Third, the levels of flow variables may well persist from year to year, e.g. a high level of sales may indicate a favourable position in the market place which will be maintained over several years (Lev and Thiagarajan, 1993).

It should also be noted that ratios of balance sheet variables do offer the possibility of co-integration, arising from an underlying error correction (ECM) mechanism. Such a mechanism would arise from the existence of equilibrium relationships between the variables, possibly expressed as target levels of the ratios. In our earlier paper (Tippett and Whitington, 1995, p. 208–9), we justified this in theoretical terms by involving two types of argument. First, from the perspective of neo-classical portfolio theory (Merton, 1969), we would expect there to be optimal levels of various assets and liabilities within a firm's balance sheet, leading to optimal ratios between them, these being determined by the relative risks and rewards of different items. Second, from the perspective of behavioural theories of the firm (Cyert and March, 1963), managers operating under conditions of uncertainty and bounded rationality might be expected to adopt rules of thumb for operating their businesses, which might be expressed as target ratios. These theoretical arguments complement one another.

The view that there are target levels of various ratios is also supported by empirical studies. Lev (1969), using US data, observed a tendency for certain ratios to converge on industry averages. Whittington (1971), using UK data (including some used in the present study), studied the behaviour of various current asset and liability ratios relative to industry averages and also (Chapter 9) found evidence that there were target levels of various ratios at the level of the individual firm. Two of these ratios (Current Asset Ratio and Stock Ratio) are used in the present study.

Table 1

Annual Means of the Variables and Ratios

Year	*Current Liabilities*	*Total Assets*	*Liquid Assets*	*Current Assets*	*Stocks*	*Debtors*	*Liquidity Ratio*	*Current Asset Ratio*	*Stock Ratio*	*Debt Ratio*
48	3238	13210	1934	7616	3376	4667	0.8673	2.6489	1.0780	0.3351
49	3479	14318	1914	8145	3730	5132	0.8341	2.6635	1.0899	0.3310
50	3732	16595	2150	9091	4014	5626	0.7616	2.6334	1.1035	0.3313
51	4724	19184	2222	11174	5503	6825	0.6924	2.6078	1.1747	0.3489
52	4528	20343	2464	11551	5578	6819	0.7744	2.7659	1.2380	0.3323
53	4707	21756	3060	12397	5426	7267	0.9276	2.9202	1.1735	0.3315
54	5354	24981	3187	13816	6198	8729	0.7406	2.6793	1.1273	0.3323
55	6085	27842	2891	15100	7094	9627	0.6323	2.6142	1.1574	0.3365
56	7047	31272	2820	16363	7985	11310	0.5698	2.5217	1.1572	0.3415
57	7564	34683	2888	17717	8802	12820	0.5113	2.4568	1.1379	0.3438
58	7361	36649	3082	17747	8482	12662	0.5912	2.5904	1.1467	0.3330
59	8269	40565	3701	19925	8911	13800	0.6093	2.5814	1.0907	0.3323
60	9598	45039	3496	22305	10517	15381	0.5118	2.4538	1.0951	0.3415
61	10450	49107	3558	23610	11188	17045	0.4345	2.3978	1.1074	0.3433
62	10817	53481	3452	24089	11419	18858	0.4060	2.3068	1.0482	0.3414
63	12809	59332	4083	27016	12332	21555	0.3916	2.2818	1.0126	0.3568
64	15205	65620	6995	33726	13874	25026	0.4788	2.2931	0.9528	0.3717
65	17381	73555	6721	36682	15442	29253	0.3923	2.1881	0.9313	0.3846
66	19729	79176	7443	39410	16114	34089	0.3752	2.1366	0.8974	0.4016
67	23914	90838	8991	47410	19026	42206	0.3506	2.1017	0.8699	0.4158
68	31462	106012	9592	56642	22768	53561	0.2889	1.8160	0.7420	0.4600
69	38637	118135	10026	63743	25907	61554	0.2444	1.6802	0.6933	0.4794
70	42989	127625	11302	69739	28128	66582	0.2222	1.6137	0.6643	0.4989
71	42617	134368	14098	72425	28921	68904	0.2653	1.7248	0.7228	0.4833
72	49652	154138	20259	85656	30982	78442	0.3210	1.7201	0.6849	0.4795
73	65181	186483	25693	108106	39393	97425	0.3197	1.6647	0.6519	0.4903
74	81182	218464	24442	127940	53744	114707	0.2483	1.5797	0.6945	0.4972
75	87541	245119	30054	144265	60521	124932	0.2873	1.6802	0.7324	0.4803
76	108652	292669	39766	179619	72958	151453	0.2848	1.7020	0.7462	0.4800
77	117942	321096	47446	198603	79302	162015	0.2931	1.7284	0.7678	0.4742
78	136189	357179	49329	218393	87056	179969	0.2718	1.6834	0.7476	0.4706
79	163490	405388	45727	247302	103990	207548	0.2308	1.5592	0.6970	0.4899
80	171599	431524	47749	252557	105431	217284	0.2421	1.5448	0.6818	0.4791

81	195189	489344	62025	287395	112999	250634	0.2643	1.4985	0.6257	0.4930
82	218527	530698	66146	309590	122383	277769	0.2654	1.4605	0.5985	0.5017
83	262125	586559	7805 1	349706	131381	308155	0.3004	1.4435	0.5541	0.5025
84	279724	633489	87157	377792	137154	333075	0.2748	1.3986	0.5386	0.5146
85	297083	6638 11	96079	395813	137332	350872	0.2559	1.3698	0.5190	0.5224
86	334711	74233 1	9972 1	432757	152822	384217	0.2294	1.3265	0.5130	0.5021
87	359874	814787	79508	423839	159046	362362	0.2037	1.2960	0.5080	0.4432
88	406486	977647	93549	475753	176677	424980	0.2052	1.2677	0.4942	0.4446
89	505769	1149156	87846	524324	192169	502504	0.2116	1.2397	0.4539	0.4418
90	527597	1198900	104724	534839	185571	497075	0.2235	1.2044	0.4292	0.4264

Notes:
The averages are across all 111 companies for the relevant year. The six variables are expressed in £'000.

A further reason for expecting some sort of ECM process to exist between the numerator and the denominator of each balance sheet ratio is that the use of such ratios is widely advocated in texts on financial analysis and they are often published in company reports (Foster, 1986, Chapter 3). This suggests that their levels will be monitored by management and investors.

Of the particular ratios selected for this study, the Current Asset Ratio is the most widely used and defined most conventionally. The Stock Ratio is also widely used, but Sales would be preferable to Current Liabilities as the denominator: unfortunately this was not widely available before the 1967 Companies' Act, and the ratio used here does have the advantages of being consistent with the portfolio argument advanced above and being supported by a previous study (Whittington, 1971). The Liquidity Ratio is also consistent with the portfolio argument, but it could be argued that bank overdrafts should be netted off the numerator. Unfortunately, this would involve making a distinction between bank overdrafts and loans, which was not made in financial statements in this period, and it might also raise the difficulty of transforming negative numbers into logarithms (as arises if we try to use rate of return in our models). The Debt Ratio is one of many possible measures of balance sheet gearing, which is widely regarded as an important measure of financial structure. It suffers from the inevitable problems of historical cost measurement, but these may be less important in the time series dimension studied here (since the valuation error may tend to persist across years for the same company) than in the cross-sectional dimension used in many of the previous empirical studies of accounting ratios.

One possible limitation of the data which deserves special note is that our data are annual and therefore cover a long time span (over 40 years). Over such a period, it is likely that there will be discrete changes in individual company financing and investment patterns due, for example, to mergers and take-overs. There may also be more continuous changes due to the evolution of management strategy or changes in markets (such as the relative availability and cost of different forms of financing). Thus, the assumption of a

constant structure, determining a common equilibrium level of a ratio over the whole period, may not be valid. Thus, if an ECM relationship is empirically supported within the constant structure framework, this is a powerful result, but if it is not supported we must not rule out the possibility that ECM processes do exist but are masked, in annual data, by changes of structure.

5. DESCRIPTIVE STATISTICS

The means of the natural (unlogged) values of the variables and ratios studied are given in Table 1. These are calculated across all 111 companies for each year and the ratios are calculated at company level. In the case of the basic variables, standard deviation (which was calculated across all companies for each year but is not reported in Table 1) is unlikely to be a good measure of dispersion because of the well-known positive skewness of the size distribution of firms. However, we can make some simple comments on the means of the variables. In every case, the trend is strongly upwards over the period, although there is considerable variability in the proportionate annual increase and only in the case of Total Assets, the most highly aggregated variable, is the value for each year always higher than that of the previous year. Thus, on average, there appears to be *prima facie* evidence for a trend in each variable, but it is possible that the series are non-stationary about the trend. The strong inflation over the period, combined with the natural tendency of surviving firms to grow in size, provide a plausible basis for explaining such a trend. The standard deviations (not reported in Table 1) also rose over the period, but the coefficient of variation (the standard deviation divided by the mean) suggests a decline in relative dispersion between 1948 and 1990 in each case, although the possible unreliability of the standard deviation in these cases needs to be borne in mind.

The ratios, on the other hand exhibit declines in their average values over the period in the case of the three current ratios (Liquidity, Current Assets and Stock). This suggests a trend towards a more parsimonious management of current assets. The Debt Ratio increases over the period, indicating greater dependence on borrowing (other than trade credit) as a source of finance. The cross-company standard deviation is a more reliable measure of dispersion in the case of ratios, which tend to have a more symmetrical distribution (Singh and Whittington, 1968). It declined over the period in each case, but in the case of the three current ratios, the overall degree of variation, as measured by the coefficient of variation, did not decline but rather increased slightly over the period. In the case of the Debt Ratio, the coefficient of variation declined over the period. Thus, the time pattern of means and inter-company dispersions which emerges from looking at ratios is strikingly different from that suggested by examination of the raw variables of which ratios are composed.

The analysis of Table 1 was repeated using logarithms (which are used in our subsequent analysis) rather than natural values. The logarithmic transformation has the advantage of making the standard deviation a more appropriate measure of the inter-firm

dispersion of the raw variables (the size distribution of firms being approximately log normal, see Hart and Prais, 1956). The log means of the variables rose over the period although (because of the proportionality built into logarithms) not so strikingly as the means of the natural values. The standard deviations also tended to rise, but not by so much, so that the decline in overall dispersion (as measured by the coefficient of variation) observed previously was confirmed. In the case of the ratios the averages of the three current ratios tended to decline over the period whereas that of the debt ratio rose marginally. These results confirm those obtained using natural values (Table 1). The standard deviations of the ratios on the other hand, had no clear time trend over the period, unlike those calculated from natural values, which tended to decline.

In summary, the logarithms of the variables (which capture proportionate rather than absolute differences) also justify the view that there may be time trends in the variables and the ratios, and the annual fluctuations are sufficient to justify the exploration of possible non-stationarity, although averaging across companies eliminates some of the inter-year variability of individual company observations and individual trends.

6. THE RESULTS OF TESTING FOR NON-STATIONARITY AND CO-INTEGRATION

In this section, we report the results of the three stages of testing proposed earlier. First, the raw accounting variables (expressed as logarithms) are tested for stationarity. Second, the selected accounting ratios (again in log form) are tested for stationarity. Third, the residuals from a co-integrating regression, involving the numerator of the ratio as the dependent variable and the denominator as the explanatory variable, are tested for stationarity.

(i) Testing Accounting Variables for Stationarity

The logarithms of each of the six accounting variables were tested for stationarity for each of the (111) companies by estimating the Dickey-Fuller (DF) or Augmented Dickey-Fuller (ADF) regression described earlier:[6] The ADF specification is used where it is found that there are autoregressive lags in the error term.

The null hypothesis is that the time series is non-stationary (i.e. α=1 in (9) above), and we test for its rejection by using the DF or the ADF test rather than the conventional *t* test which is not valid in the presence of a unit root. The selection of an additional time trend and the order of augmentation of the autoregressive lags is done by choosing the specification which performed best according to the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC). These are likelihood ratio tests, commonly used in choosing specifications: they are alternative tests, based on different likelihood functions (Kennedy, 1998, pp. 103–4) The time trend specification was selected in every case, because that performed best according to these criteria (Table 2).

The selection of the order of augmentation was somewhat more problematical. It was assumed on *a priori* grounds that the effects of the levels of accounting variables of

earlier years would be slight, especially for the variables selected, which were mainly current items. In such cases, it was expected that the level at the opening balance sheet (y_{t-1}) would be important, with possibly some correction to the level of the previous balance sheet, but a lag of three periods (the highest selected) was considered unlikely. However, Table 3 shows that, although a single period lag yielded the strongest result for four variables, for the remaining two (Current Liabilities marginally and Liquid Assets strongly), a three period lag seemed to provide the better fit. Despite the fact that this is essentially a statistical result, with no underpinning in *a priori* theory, the subsequent tests for stationarity are based on the best-fitting specification, i.e. a three-period lag with an augmented Dickey-Fuller test (ADF3) for Current Liabilities and Liquid Assets, and no lag (a simple DF test) for the other four variables.

The results of the testing for stationarity are given in Table 4. It will be seen that, as expected, we are unable to reject the hypothesis of non-stationarity in the overwhelming majority of cases. The most important indicator of this is the column *n*, the number of cases in which the DF or ADF test statistic is significant at the 5 per cent level, so that we can reject the null hypothesis. Out of our 111 observations, we might expect about 6 significant cases (i.e. 5 per cent) to occur randomly, even if the series were fundamentally non-stationary, and only in the case of stocks, with 16 significant results, is there any sign of systematic deviation from non-stationarity. However, even in this case, 16 out of 111 observations does not provide strong grounds for rejecting the maintained hypothesis of non-stationarity. We conclude that, as expected, we are unable to reject the belief that the accounting variables behave through time in a non-stationary manner.

Table 2

Choice of Trended or Untrended Specifications

Choice Criterion	*Current Liabilities*	*Total Assets*	*Liquid Assets*	*Current Assets*	*Stocks*	*Debt*
AIC						
Untrended	22	38	22	32	33	27
Trended	89	73	89	79	78	84
SBC						
Untrended	39	59	44	58	43	49
Trended	72	52	67	53	68	62

Notes:
The numbers represent the number of companies for which the relevant specification fitted best according to the relevant criterion, the AIC (Akaike Information Criterion) or SBC (Schwarz Bayesian Criterion): there are 111 companies in all. The equations tested all had a single period lag, apart from that for Current Liabilities, which had a three period lag (p=3 in equation (14)), selected on the basis of the results in Table 3.

Table 3

Choice of Order of Augmentation of Lags

Best-fitting Order of Augmentation	*Current Liabilities*		*Total Assets*		*Liquid Assets*		*Current Assets*		*Stocks*		*Debt*	
	AIC	*SBC*	*AIC*	*SBC*	*AIC*	*SBC*	*AIC*	*SBC*	*AIC*	*SBC*	*AIC*	*SBC*
0	40	41	62	85	8	5	52	73	60	62	51	50
1	16	10	26	16	7	2	25	18	17	11	12	4
2	14	3	11	4	19	5	17	6	10	6	14	7
3	41	57	12	6	77	99	17	14	24	32	34	50

Notes:
The numbers in each column give the numbers of companies for which the particular order of augmentation (0 to 3) was best fitting with respect to a particular criterion AIC (Akaike Information Criterion) or SBC (Schwarz Bayesian Criterion). Each column therefore sums to 111, the total number of companies studied. The estimated equations all incorporate a time trend, consistent with the evidence in Table 2, but the results were not changed materially when the time trend was omitted.

Table 4

Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF3) Tests for Stationarity

Variable	*Test*	*Significant Cases, n*	*Mean*	*Median*	*Lower Quartile*	*Lowest*
Current Liabilities	ADF3	5	−2.025	−2.030	−2.708	−4.777
Total Assets	DF	1	−1.724	−1.697	−2.359	−4.436
Liquid Assets	ADF3	4	−2.274	−2.181	−2.726	−9.289
Current Assets	DF	8	−1.938	−1.771	−2.596	−5.727
Stocks	DF	16	−2.131	−2.135	−2.743	−6.230
Debtors	DF	10	−2.134	−2.085	−2.856	−5.873

Notes:
Each row summarises the test statistics for 111 separate tests on individual companies. The critical value of the tests is −3.528 for the trended equation estimated here.

(ii) Testing Accounting Ratios for Stationarity

The next phase of the empirical investigation tests our original conjecture that accounting ratios might be stationary despite the fact that, as demonstrated by the first phase of testing, the underlying accounting variables are non-stationary.

We test the accounting ratios for Stationarity by replicating the procedure used for accounting variables. Thus, the basic model tested is that in (14) above, and Tables 5, 6 and 7 are the equivalent for ratios of Tables 2, 3 and 4 for variables.

Table 5

Choice of Trended or Untrended Specifications

Choice Criterion	*Liquidity Ratio*	*Current Asset Ratio*	*Stock Ratio*	*Debt Ratio*
AIC				
Untrended	53	22	20	57
Trended	58	89	91	54
SBC				
Untrended	74	29	37	76
Trended	37	82	74	35

Notes:
The table is arranged in the same way as Table 2. The Liquidity Ratio is estimated from an equation with a three-period lag, and the others have no lag. This is justified by the results in Table 6.

Table 6

Choice of Order of Augmentation of Lags

Best-fitting Order of Augmentation	*Liquidity Ratio*		*Current Asset Ratio*		*Stock Ratio*		*Debt Ratio*	
	AIC	*SBC*	*AIC*	*SBC*	*AIC*	*SBC*	*AIC*	*SBC*
0	9	4	67	77	67	79	77	89
1	7	2	20	11	14	5	18	10
2	16	7	8	4	9	3	5	3
3	79	98	16	19	21	24	11	9

Notes:
The arrangement of the table is similar to that of Table 3. The results for the Liquidity and Debt Ratios are derived from a model without a time trend, in accordance with the evidence in Table 5. The other two sets of results are derived from a model with a time trend.

Table 7

Dickey-Fuller (DF) and Augmented Dickey Fuller (ADF3) Tests for Stationarity

Variable	*Test*	*Significant Cases, n*	*Mean*	*Median*	*Lower Quartile*	*Lowest*
Liquidity	ADF3	12	−1.807	−1.862	−2.549	−4.056
Current Asset	DF	33	−3.051	−3.049	−3.643	−5.612
Stock	DF	21	−2.756	−2.711	−3.332	−5.521
Debt	DF	7	−1.891	−1.765	−2.304	−4.922

Notes:
The arrangement of the table and the critical values of the tests are the same as in Table 4, except that the critical value of the test statistic is −2.938 for the Liquidity and Debt Ratios for which untrended regressions have been estimated.

Table 5 shows that two of the ratios, Liquidity and Debt, do not exhibit a systematic trend term. This is consistent with the somewhat impressionistic view of changes over the period which was gained from Table 1. However, the remaining two ratios, Current Asset and Stock, do have a clear tendency to trend over time. Thus, the subsequent results will use a trend model only for the latter two variables.

Table 6 shows that the Liquidity Ratio seems to evolve according to a three period lag adjustment process. This is consistent with the results obtained earlier for the numerator of this ratio, Liquidity. The other three ratios do not appear to be well described by a lag beyond the current period (y_{t-1} to y_t). Thus, the subsequent analysis (Table 7) applies the ADF3 test to the Liquidity Ratio and the DF test to the remaining three ratios.

The results of Table 7, which arise from applying the DF and ADF tests to the best-fitting models, give only limited support to our conjecture that accounting ratios, unlike accounting variables, are stationary. The strongest result is for the Current Asset Ratio, where we are able to reject the null hypothesis of non-stationarity in 33 cases out of 111: if the hypothesis testing procedure were reversed, it seems that we would be unlikely to reject the null hypothesis of stationarity in a majority of cases. The Current Asset ratio is a particularly well known and widely advocated ratio which probably features frequently in lending decisions and associated covenants. It would therefore not be surprising if there were forces preventing it from drifting in a manner consistent with a random walk.

However, even for the Current Asset Ratio, the results are not decisively in favour of preferring stationarity. In the case of the other ratios, the results are less in favour of stationarity. In the case of the Debt Ratio, the support for rejecting non-stationarity is very weak, and even weaker than was the case for the Debt variable. The Liquidity Ratio has only 12 statistically significant cases (as opposed to 4 for the Liquidity variable): only a very small movement in favour of accepting stationarity. The Stock Ratio has slightly more cases (21) in which we can reject non-stationarity, but we cannot attribute this to the ratio transformation because the stock variable itself had only 5 less cases (16, in Table 4).

Thus, the conclusion is that the ratio transformation does not *in general* make a significant contribution to removing non-stationarity from accounting variables. In a small number of individual companies, it does have this effect, but this is not a useful result unless one can identify specific characteristics of these companies which may be expected to lead to the result being permanent (e.g. if, in the case of the Debt Ratio, certain companies had debt covenants written on this ratio, which ensured it against long-term drift). In the case of one ratio, the Current Asset ratio, we have found a tendency to stationarity, although the result is not a strong one.

Thus, the third empirical question which we posed earlier appears to be potentially important. Ratios seem, at least in some cases, to provide a tentative but incomplete step towards removing non-stationarity. It is therefore possible that the more general step implied by estimating a co-integrating regression between the numerator and the denominator of the ratio will provide a more powerful means of inducing stationarity in the residuals.

(iii) Testing for Co-integration Between the Numerators and Denominators of Ratios

The first stage of this test is to estimate the co-integrating regression of the numerator of each ratio on its denominator, as in (12) above. The main purpose of this process is to estimate the residuals, in order to test them for stationarity. However, the estimated coefficients of the co-integrating regression are of some interest in their own right, in view of the earlier work of Lev and Sunder (1979), Whittington (1980) and others, which has suggested that there may be a constant term in the relationship. The existence of a constant term would, of course, violate the ratio assumption of a linear homogeneous relationship, and, in the context of the present study, this might suggest that the cointegrating regression was a superior specification to the ratio form.

Table 8 summarises the results of estimating the coefficients of the co-integrating regression. We cannot rely on the *t*-tests of statistical significance, because of the earlier finding of widespread non-stationarity in the underlying variables. However, if co-integration exists, the point estimates of the coefficients will be consistent, and possibly, if our sample is large enough, 'super-consistent'. The results in Table 8 therefore provide some evidence of the existence of constant terms in the co-integrating regressions. They are also consistent with the earlier results of Whittington (1980) and others, who have reported constant terms in relationships commonly summarised as ratios (although the present study is in a time series rather than a cross-sectional dimension). The constant

Table 8

Coefficients of the Ratio Regressions

	Liquidity		*Current Asset*		*Stock*		*Debt*	
	Constant	*Slope*	*Constant*	*Slope*	*Constant*	*Slope*	*Constant*	*Slope*
Mean	0.3813	0.7665	2.1119	0.8377	1.4349	0.8105	−2.3185	1.1298
Highest	8.4869	1.6577	5.6685	1.1058	4.9395	1.1657	2.6395	1.6579
Upper Quartile	2.5296	0.9653	2.5669	0.8861	2.1825	0.8903	−1.3022	1.2084
Median	0.7728	0.7981	2.1492	0.8330	1.5263	0.7939	−2.2165	1.1185
Lower Quartile	−1.8030	0.5723	1.4355	0.7900	0.7986	0.7391	−3.1100	1.0462
Lowest	−9.8423	−0.2033	−1.0661	0.5630	−2.4724	0.4219	−9.6810	0.7457
t-test *(n)*	77	102	107	111	96	111	105	111

Notes:

The table gives values of the point estimates of the coefficients of the ratio regressions. Each regression involved regressing the numerator of the ratio on its denominator, with a constant term as well as a slope coefficient. The final row gives the number of companies (out of 111) in which the relevant coefficient appeared to be significant at the 5% level, according to the two-tailed *t*-test. This is probably misleading in the majority of cases because of non-stationarity in the underlying variables.

terms are typically positive, except in the case of the Debt Ratio, for which the slope coefficient is typically greater than 1.0. The slope coefficients for the other ratios are typically less than 1.0, implying positive constant terms. In the case of the Liquidity Ratio there were five instances of negative slope coefficients, which imply that the ratio specification is entirely inappropriate for these companies, there being no evidence of positive association between the numerator and the denominator.

Table 9 gives the results of testing the residuals from the co-integrating regressions for non-stationarity. A comparison of these results with those for the ratios (Table 7) shows a small increase in the number of cases in which we can reject the hypothesis of non-stationarity. This is most marked in the case of Debt (which had the weakest results previously) and negligible in the case of Current Assets (which previously had the strongest results).

Table 9

Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF 3) Tests for Stationarity of Residuals

Ratio	*Test*	*Significant Cases, n*	*Mean*	*Median*	*Lower Quartile*	*Lowest*
Liquidity	ADF3	12	−2.517	−2.508	−2.984	−4.774
Current Asset	DF	34	−3.096	−2.992	−3.715	−5.866
Stock	DF	26	−2.811	−2.739	−3.422	−5.334
Debt	DF	15	−2.508	−2.405	−3.066	−5.244

Notes:
The critical values of the tests are −3.497 for Liquidity and −3.485 for the other ratios.

The overall results, although slightly stronger than those for the ratio method, confirm our earlier conclusions about Stationarity. If we maintain the hypothesis of non-stationarity, we are unable to say that either the ratios themselves or the residuals from a co-integrating regression incorporating the ratio components are stationary. On the other hand, there is stronger evidence for Stationarity than was the case when the raw variables were tested (Table 4). This is particularly the case for Current Assets and, to a lesser extent, for Stocks.

7. CONCLUSION

With respect to our three basic empirical hypotheses, the conclusions are as follows:

1. The logarithms of the *variables* forming the numerators and denominators of the conventional accounting ratios studied here *are non-stationary* by the standards of conventional statistical tests.
2. The *ratio transformation does not eliminate this non-stationarity,* although it does reduce it to some extent.

3. The *pairs of variables* comprising the numerator and denominator of each variable studied, are *not co-integrated*, in general, although they may be in the case of individual firms, and the extent of apparent co-integration varies substantially between different ratios, being most prevalent in the current ratios (current assets/current liabilities).

The main implication for empirical research in accounting is that the possibility of non-stationarity in the variables, and its associated econometric pathology, should always be addressed when carrying out time series analysis. Moreover, there is no evidence that the use of ratios or co-integration between the variables will alleviate these problems to any significant extent. Thus, time series analysis involving ratios is not likely to be immune from the problems of non-stationarity. With regard to our own earlier work (Tippett and Whittington, 1995), we were correct to recognise the importance of modelling the time series properties of accounting ratios, and the underlying variables, but our favoured model, the Elastic Random Walk, is a form of error correction model (ECM) whose general validity (and reliability of estimation) would require co-integration to be more widespread than is suggested by the present study. We must, however, acknowledge two limitations of the present study, which may justify further research.

First, we have studied a limited range of ratios selected to conform with our earlier study which was confined to those balance sheet ratios whose components (numerators and denominators) are always positive. Even within this group of ratios, the extent of apparent co-integration has varied considerably. This is not surprising, given the limitations of the ratio measures studied and it is notable that the most plausible (and probably the most widely used) of these measures is the Current Asset Ratio, which exhibited the greatest apparent incidence of co-integration. Furthermore, there are other classes of ratios for which the error correction relationship, which underlies co-integration, might seem to be more appropriate. Notable among these are profitability ratios: it has long been recognised that the forces of competition are likely to confine the profit rates of individual firms within limits, especially over a period of years (Whittington, 1971, provides empirical evidence of this). Thus, the study of such ratios might yield stronger evidence of co-integration than is found in the present paper. However, because profits can be zero or negative, the study of profitability ratios raises a number of difficulties relating to the scaling and statistical distribution of the variables, especially if, as in the present study, our models require logarithmic transformations of the variables (Tippett, 1990). The strict equivalence between a ratio and a co-integrating regression holds only when the variables (the numerator and denominator) are expressed in logarithmic form.

Second, in order to obtain a reasonably large set of annual observations, our data span 43 years, a period over which significant structural changes might be expected to take place in any co-integrating relationship that existed. The long-term changes in the average values of the ratios in Table 1 provide anecdotal evidence of this: they suggest that there were changes in the target values (or perceived equilibrium values) of the ratios studied. Such changes would not be simple discrete events which would be identified by

conventional methods of dividing the time series into shorter components and testing for changes in structure, and the scope for such tests is, in any case, limited by the relatively small number of observations. A more promising route would be to obtain more frequent time series data over a shorter period, for which structural change would be less important. The improvement in the quality of interim accounts may enable such time series to be assembled for recent periods, e.g. in the USA, quarterly reporting is now standard practice for listed companies.

8. IMPLICATIONS FOR FUTURE RESEARCH

The empirical study in the present paper is only a first attempt to test the co-integrating properties of accounting ratios. We have indicated above that future research should address other ratios, which may have stronger tendency for the numerator to adapt to changes in the value of the denominator (the ECM process). It should also attempt to allow for structural changes, e.g. by testing for breaks resulting from major take-overs. Ideally it would also use denser time series, e.g. using the quarterly interim data that are available for leading US companies, or the half yearly interims that are published by listed UK companies.

Co-integration should not be viewed simply as a means of avoiding econometric pathology in time series analysis. Researchers should be aware that the ECM process underlying co-integration is of interest in its own right, and there is considerable potential for modelling such processes. Our own earlier work focused on how individual accounting ratios evolved through time, and the present paper has extended this by testing for co-integration between the numerator and the denominator. A further extension would be to model how, through time, different accounting ratios themselves adapt to one another, and how specific accounting ratios of individual companies adapt to those of peer-group firms. The earlier studies in this area (e.g. as pioneered by Lev, 1969) were conducted on a cross-sectional basis, but time series analysis is potentially more powerful in capturing lagged responses. In a time series analysis of this type, it is possible that the ratio variables, although (as the present study suggests) characterised by non-stationarity, are cointegrated with one another, thus avoiding the econometric problems usually associated with non-stationarity.

NOTES

1 This section of the paper provides an intuitive introduction to the issues of non-stationarity and co-integration. A more detailed and rigorous treatment of these subjects is to be found in Hamilton (1994).

2 The effects of integration will be additional to any deterministic trends in the variables, due to such factors as price changes, which may lead to fairly steady levels of exponential growth in the variables. In estimating Dickey-Fuller regressions, it is customary, where appropriate, to include deterministic trend factors as well as stochastic drift factors.

3 Co-integration is not confined to pairs of variables and can apply to a larger vector of variables. In such cases, the tests proposed by Johansen (1988) are often preferred to the Dickey-Fuller tests used in our analysis. However, the present paper is concerned with the properties of ratios which are, by definition, amalgams of pairs of variables (the numerator and the denominator respectively).

4 The tests appropriate for the present case, where estimated residuals are being used, are slightly different from those applied to the raw data. See Pesaran and Pesaran (1997, Chapter 16), which provides a comprehensive account of the Microft procedures used in this study.

5 These would have made the computation of logarithms impossible. More important, negative or zero values of these particular variables possibly indicated the use of accounting conventions which brought into question the meaning of the variables in such cases.

6 Pesaran and Pesaran (1997, p. 217) specify the tests in more detail.

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THE DETERMINANTS OF AUDIT FEES: SOME EMPIRICAL MODELS

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THE ISSUES

The primary motivation for this study is to gain an understanding of the working of the audit market, particularly with respect to such issues as the 'Big 6' (formerly Big 8) effect and low-balling. The empirical tests use data for the UK but the issues considered apply to auditing in many countries, and the previous empirical literature includes studies relating to the USA and Australia, in addition to the UK. This previous literature provides a secondary motivation for the paper, namely the need to discuss and clarify the specification of the underlying model of audit fee determination. Previous studies have tended to use an *ad hoc* empirical model with only a cursory discussion of its rationale, and we attempt, in the next section of this paper, to remedy this deficiency.

The market in audit services has become the subject of increasing attention by academic researchers and by policy makers in recent years. Academic research has been stimulated partly by developments in information economics and agency theory (e.g. Watts and Zimmerman, 1986, Chapter 13) which have afforded richer insights into the crucial role of the auditor as an intermediary between corporate managements (who

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possess superior inside information) and capital markets (which have inferior outside information and need the comfort provided by the audit opinion to induce them to rely on the information which is published to them, for investment purposes). This, in turn, has brought into sharper focus issues such as auditor independence and the incentive structures facing auditors. Similar concerns have been raised by policy makers, partly as a result of specific cases in which auditors have been the subject of litigation, but also as a result of some notable changes which have taken place in the structure of the auditing profession, especially the rapid growth of the Big 8 auditing firms and their reduction by merger to the Big 6.[1] This has left the auditing of the largest corporate enterprises in the hands of a relatively small and potentially oligopolistic group of auditing firms.

Against this background, there have been a number of empirical studies of the audit market. A particular concern has been the Big 8 effect on audit fees, i.e. the extent to which Big 8 auditing firms charge different fees from other auditing firms (e.g. Palmrose, 1986a; and Francis and Simon, 1987). One expectation is that Big 8 firms may have higher fees, possibly because of the higher quality of their work (including a reputation effect) and the associated costs, and also possibly because of their oligopolistic market position, particularly for larger auditee firms. An alternative expectation is that Big 8 fees will be lower because of auditor scale economies. An associated concern is with low-balling (e.g. Simon and Francis, 1988), i.e. the alleged tendency for auditors to cut fees in order to capture new audits. This is typically believed by policy makers (e.g. AICPA, 1978) to prejudice auditor independence, since the auditor needs to retain the audit for several years to recover the initial costs incurred in the setting up of the audit under a low-balling regime. It is not immediately obvious that, having incurred an initial fixed cost, the auditor should be in a worse competitive situation than in the absence of such costs, since any competitor for the audit would incur similar costs. However, theoretical arguments can be advanced to show that this perception might exist and the auditor might therefore feel unduly dependent on the support of the management of the auditee firm (Simon and Francis, 1988, pp. 266–7).

The results of previous empirical studies of the determination of audit fees all show that, as would be expected, there is a strong correlation between audit fee and size of auditee. There is also some evidence in favour of the view that Big 8 firms charge higher fees than other auditors and that low-balling does take place. However, there is considerable variation in the results obtained.[2] This is partly due to the different data used, but also to variations in the specifications of the models used. These models all have audit fee as the dependent variable and auditee size as an explanatory variable. Both size and audit fee are sometimes subject to a logarithmic transformation, with little discussion of the reason for this, although economies of scale are often invoked as a reason for transforming the size measure. An alternative transformation which has been applied to the size measure is the square root. Size is usually measured in terms of total assets, although Chan, Ezzamel and Gwilliam have recently used a turnover measure. Various measures of audit complexity and risk are usually added as explanatory variables in additive linear form, although when audit fee is expressed in logarithmic form this applies a multiplicative relationship between the explanatory variables.[3] In certain studies, additional variables are added to capture the possible low balling effect of change

of auditor (Palmrose, 1986a; and Francis and Simon, 1987) or the Big 8 effect (Simon and Francis, 1988). This also is usually done in an additive linear form (but in the two cases cited, with a logarithmic dependent variable, implying multiplication), and with no discussion of the choice of form.

Thus, previous empirical studies of the determinants of audit fees appear to have a common rationale, but that rationale is not made explicit. The next section of this paper attempts to address this problem by considering what form of model is consistent with the theoretical issues being addressed. The following two sections provide a test of our model, the third section discussing the data and the fourth section presenting the results of estimation. The final section draws together our main conclusions.

MODELS OF THE DETERMINATION OF AUDIT FEES

In this section we attempt to explore the theoretical rationale of the empirical models of audit fees which are extant in the literature, and to derive from this our own models which will be tested in later sections. We start by considering the fundamental question of identification which has, in previous studies, been dealt with by implicit assumption rather than explicit discussion. We then consider the question of auditee size, which drives all models of audit fee determination and has been shown empirically to be important. We then consider other aspects of audit cost, such as complexity and risk. Finally, we consider two variables which are of particular experimental interest: the Big 8 variable and change of auditor (low-balling).

Identification

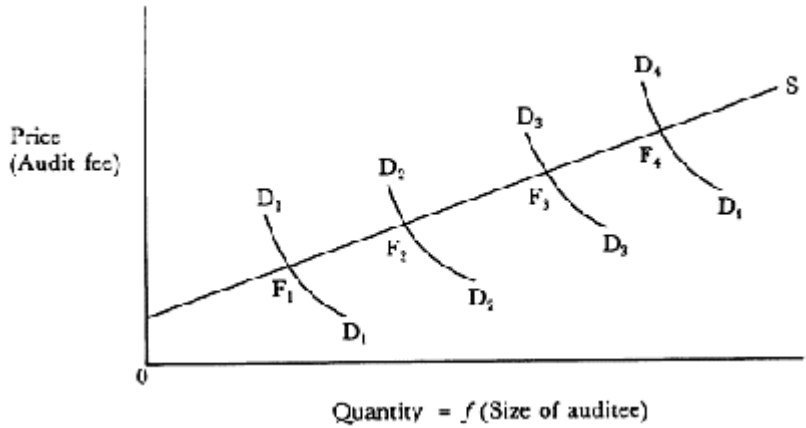
Audit fees are the prices of certain services, and models which are driven by auditee size can be interpreted as using the latter variable as a proxy for the quantity of audit services required (a larger auditee requires more work). Thus, one important dimension of extant models of the audit market is a regression line fitted on a scatter of price/quantity (or audit fee/auditee size) observations across different auditee firms. It has been well known since the classic econometric paper of Working (1927) that this raises the identification problem, i.e. are we observing the supply curve (willingness of audit firms to supply individual audit services at different fee levels), the demand curve (the demand by individual auditees for audit services at different levels of fee) or a meaningless hybrid?

For a single equation model of this type, the identification problem is solved if we can assume that one curve (supply or demand) shifts between observations whereas the other is constant across all observations. In the case of single-equation cross-sectional analysis of the audit market, it seems plausible to assume that the supply curve is fixed whereas the demand curve shifts between auditees. The supply curve will be determined by the cost function of audit firms (the possible pattern of which is discussed below) and will be a function of the amount of work done, irrespective of the identity of the auditee (although special characteristics of the auditee may cause additional costs, which will be

discussed later). Demand, on the other hand, will depend primarily upon the size of the auditee. An audit is a statutory requirement and the minimum standard of the audit is laid down by statutory and professional standards. Thus, demand is inelastic to fee and mainly dependent upon the amount of work required, as determined by the size of the auditee, although the possibility of a quality variable in the form of a Big 8 premium will be considered later.

Figure 1

Assumed Solution to the Identification Problem



This set of relationships is illustrated in Figure 1. S is the common cost function which applies across all audits. D_1, D_2 etc. are the inelastic demand curves for audit services by auditees of different sizes. The intersections F_1, F_2 etc. represent the equilibrium fees which will (subject to random error and other factors discussed later) be those observed across a cross-section of auditees. The line connecting these points is what we estimate in a regression of Fee on Size, and it is a supply curve. Thus, we contend that previous models of audit fee determination have implicitly been estimating the supply curve of audit services, although the identification problem has not been explicitly discussed.

The Fee Measure

The dependent variable in our analysis is audit fees. An interesting related issue which has been addressed by Palmrose (1986b) is the question of fees paid to auditors or their associates for non-audit services. We do not address this question here, because our central concern is with auditing services and it is important to clarify the basic model before adding refinements of this type. It is also the case that public disclosure of information on fees for non-auditing services was not required in the United Kingdom (to which our data relate) until 1991.

In many of the most important previous empirical studies in this area (such as Palmrose, 1986a and 1986b; Francis and Simon, 1987; and Simon and Francis, 1988), the audit fee variable has been transformed logarithmically. This has the effect of making the relationship between the explanatory variables a multiplicative one (since they now have an additive effect on the logarithm of fees). We find this assumption of universal multiplicative interaction to be unduly restrictive as an initial assumption and prefer to work with the absolute value of fees as the dependent variable adding interactions between the explanatory variables when these seem to be appropriate on *a priori* theoretical grounds.

The Size Factor

In Figure 1, we have assumed that the cost of auditing is approximately a linear function of the size of the audit. However, various authors have suggested that there may be economies of scale in auditing from the perspective of the auditee, i.e. large audits may cost less, per unit of assets or transactions audited, than do small audits. This is usually dealt with by making the size variable a logarithmic function, but without much discussion or explanation. It is, in fact, unnecessary to make the size variable logarithmic in order to capture economies of scale. Some authors have suggested a square root transformation but the method we suggest is a quadratic form:

$$\text{Audit fee} = a + b.\text{Size} + c.\text{Size}^2 \qquad (1)$$

It is usual to include a constant term *a* in the relationship, without explanation, and presumably as a 'catch all' term for errors in the specification of the regression model. However, if it is positive, the constant can also be interpreted as capturing the fixed costs of setting up an audit and hence, in combination with the linear coefficient on Size *b*, the economies of scale due to spreading this cost. The quadratic term Size^2 also enables economies of scale to be captured, if its coefficient *c* is negative.[4] If this coefficient is positive, there are decreasing returns to scale, and this is not impossible in the case of a small auditing firm attempting to handle a very large audit for which it is not well equipped. Hence the quadratic form will have particular advantages when we come to assess the charges of small audit firms relative to the Big 8. In general, the extra parameter in the quadratic form adds a degree of flexibility to the estimation process.

Another aspect of the size factor which deserves consideration is the choice of size measure. Previous studies have tended to favour total assets but others have suggested turnover as an alternative (Chan, Ezzamel and Gwilliam, 1991). However, there is no reason why both of these measures should not be relevant, i.e. size may have more than one dimension. An audit may have two broad aspects, an audit of transactions and verification of assets. The former will be related to turnover and the latter to total assets. Hence, it is possible that both variables should feature in a model of the determination of

audit fees, i.e. the fee level should be regarded as a point on a plane rather than (as in Figure 1) a line. The implicit reason why previous research has ignored the possible two-dimensional nature of size is the possibility of multicollinearity, i.e. the two variables may be so highly correlated that it is not possible statistically to distinguish between the effects of the two variables. However, this is an estimation problem which should be dealt with at a later stage, if it arises, rather than influencing the specification of the basic model. In fact, it transpires the multicollinearity is not a serious problem (see the section headed Estimation, below).

Other Aspects of Audit Cost

Although auditee size seems, on the basis both of *a priori* reasoning and of previous empirical evidence, to be the main factor driving audit fees, other measurable factors may also be relevant. Two which are commonly tested and seem likely to be important are complexity of audit and audit risk.

Complexity of audit may be seen, together with the two size variables (turnover and total assets) as a dimension of the amount of work involved in an audit. It may interact with the size variables, either because it involves more time or more skilled labour per unit of turnover or assets audited. There may also be a fixed cost to complexity, resulting from the higher set-up costs of a complex audit.

The measurement of complexity can take a number of forms. One popular measure is the number of subsidiaries of which a group is composed. More subsidiaries imply a greater amount of work in consolidation and eliminating intra-group transactions. The square root of a number of subsidiaries has been used (e.g. Simon and Francis, 1988) but the rationale of this is not clear: if anything we might expect complexity to rise more than proportionately with the number of subsidiaries because of the exponential increase in the number of potential cross-relationships. Other possible measures of complexity are proportions of assets held overseas, and other measures of balance sheet or turnover composition. The extent to which these measures are explored will depend upon data availability and on the extent to which they are likely to have a significant non-random effect on the model, insofar as they are regarded as control variables rather than the variables of experimental interest.

Risk is an important consideration for auditors, bearing in mind the possibility of legal action for auditor negligence and the possible loss of income from future audit services. Both of these potential losses by the auditor are likely to arise from failure of the auditee business, although they could also arise from other events, such as failure to detect a material error in the accounts. Risk, like complexity, could be visualised as having two types of role in determining audit fees. It could be seen as a constant component of the set-up costs of the audit, i.e. a fixed insurance premium. Alternatively or additionally, it could be seen as inter-active with size measures, the amount of risk being greater the greater the size of the auditee. In particular, the expected value of the loss (legal damages or loss of future audit fees) is likely to be larger, the larger the size of the auditee.

The measurement of risk, like that of complexity, offers a number of alternative measures, the choice between which will depend in theory on their potential relevance

and in practice on data availability. The reasons for measuring risk in this case suggest that a measure of the probability of business failure by the auditee is appropriate. Measures of this type which have been used in past studies include indebtedness measures, such as the Debt/Equity ratio, and measures of profitability. A measure indicating that a firm has made a loss is clearly an indicator of potential distress. A measure of profitability may also be used as a risk measure but it may also be a measure of other factors: the auditor may perceive low profitability as incurring costs by increasing risk but he may perceive very high profitability as an opportunity to raise the audit fee by charging 'what the market will bear'. The latter interpretation does, however, imply monopoly rents for the incumbent auditor, suggesting that the audit fee is not always set at minimum cost.[5]

The Big 8 Effect and Change of Auditor

From the point of view of the present study, the variables discussed above are control variables, selected to give a prediction of what we would expect the level of the audit fee to be, given the size, complexity and risk of the particular audit. The experimental variables of central interest in this study are the Big 8 variable and the change of auditor variable.

The Big 8 variable is a dichotomous variable; either an audit firm is in the Big 8 or it is not.[6] In regression analysis this is characterised by a dummy variable, equal to one when the audit firm under observation is a Big 8 firm and equal to zero otherwise. One way in which this might affect audit fees is by an additive variable, predicted to have a positive coefficient representing the 'Big 8 premium'. This would represent a constant premium on the fixed set-up cost of the audit, representing on the cost side the costs of establishing the 'Big 8' reputation and technical know-how, and justified on the demand side by the high reputation and quality of the service. However, it is implausible to assume that the Big 8 effect is uniform for all auditees. It seems much more plausible to assume that Big 8 firms will have different charge-out rates related to work done. Thus, we should expect the Big 8 variables to inter-act with the other determinants of fees, particularly size and complexity. A Big 8 premium would imply a higher overall level of fees but not necessarily a higher charge for each component of fees. Thus, for example, Big 8 firms may be better at handling complexity, because of their greater technical expertise, so that, other things being equal, Big 8 firms may be relatively cheap for more complex audits. This would imply a negative coefficient on BC, the Big 8/Complexity inter-action variable. Equally, Big 8 firms may be relatively well equipped to do large audits. Thus we might expect a negative coefficient on BS^2, the Big 8/Squared Size interaction variable, but a positive coefficient on BS, the Big 8/Size variable. The former would be evidence of relatively greater economies of auditee scale in Big 8 firms, but the latter would indicate the relatively expensive charge rates of Big 8 firms.

The change of auditor variable is also a discrete variable. For the purpose of simplicity we shall assume that it too is a dichotomous dummy variable, equal to one if the audit fee

represents the first charged by a new auditor and zero otherwise, although additional variables can be introduced to capture the effects of auditor change in other recent years (Simon and Francis, 1988). Adding the change of auditor variable to a non-logarithmic model captures a fixed effect common to all audits, irrespective of size, a negative coefficient implying low-balling. However, we would expect low-balling to lead to a greater reduction of the amount of the fee for larger audits. Thus, some degree of interaction with the other determinants of audit fees would be expected. At minimum, we would hypothesise that a linear Size of Auditee times Change of Auditor variable would be relevant and that a negative coefficient on this variable would indicate a low balling effect. It should, however, be noted that, although negative coefficients on the change of auditor variables are definitely indicative of low balling, it is not necessarily the case that zero or positive coefficients indicate the absence of low-balling. If we make the plausible assumption that there are positive costs to setting up a new audit, then a fee which recovers the costs of the incoming auditor (i.e. no low-balling) will be higher than the fee charged under competitive conditions by the previous incumbent auditor, to whom past set-up costs are a sunk cost (Grout, 1991).

A final consideration is the possibility of inter-action between the Big 8 variable and the change of auditor variable. Multiplying the two together gives us a variable which indicates the existence of two conditions: the auditor has changed and the incoming auditor is a member of the Big 8. This could be used to test whether Big 8 auditors low-ball to a greater extent (a negative coefficient) or a lesser extent (a positive coefficient) than other auditors. There is also the possibility of the interaction of this variable with other variables. Finally, an alternative characterisation of the change/Big 8 inter-action would be to distinguish changes between those within the Big 8 or the non-Big 8 and those which involve a switch from non-Big 8 to Big 8 auditors and those which move in the reverse direction. We might expect the non-Big 8 to Big 8 switch to be relatively expensive, since it indicates a desire by the auditee to move up the audit market, whereas a move away from the Big 8 might indicate a particular willingness to sacrifice reputation for a lower fee.

An Over-view of the Proposed Model

We may now summarise the broad form of the model of audit fee determination which arises from the above discussion.

We have proposed an additive (non-logarithmic) model of the following form:

$$\text{Audit Fee} = f(\text{Size, Cost Variables, Experimental Variables, Interactions}) \quad (2)$$

The preferred form of the Size relationship is the quadratic, as shown in (1) above. We also propose that two size measures, one based on turnover and one based on assets, can be used together, additionally, to capture different dimensions of audit work.

The cost variables which we have considered particularly are complexity and risk. We would expect both of these variables to have potentially both a linear additive effect (fixed cost) and an inter-active effect related to size of auditee (variable cost).

The experimental variables chosen for the present study are the Big 8 effect and the change of auditor (low-balling) effect. We anticipate that the Big 8 effect will not simply be a constant amount but will also take the form of interaction with the main cost variables, size (including the quadratic term) and complexity, on the basis that Big 8 firms may be relatively well equipped to deal with these factors. The change of auditor variable might also be expected to interact with size of auditee, as well as having a fixed effect, but this interaction might be less complex.

The interaction variables proposed have been described above. However, a general advantage of the additive (as opposed to the logarithmic) model should be noted: we have been able to select those multiplicative interactions which seem to be plausible and to reject the others, rather than forcing all of the explanatory variables into what is implicitly (when the dependent variable is in a logarithmic form) a multiplicative relationship with all the others.

THE DATA

Our empirical study is based upon a sample of large listed companies in the UK. It is therefore particularly suitable for detecting Big 8 effects and economies of scale in the upper end (larger auditees and higher fees) of the audit market. The sample is the 577 UK listed companies which were included in *The Times 1,000, 1980–81* list of the largest industrial companies and which retained their Stock Exchange listing throughout the period 1981 to 1988. Data on these companies were collected annually for the subsequent eight years, 1981 to 1988 inclusive, accounting data being matched on a calendar year basis (accounts for periods ended in a particular calendar year are regarded as being data relating to that year). Thus, our data are a panel of cross-section and time-series observations, and it was necessary to generate a time variable (T=1 in 1981, and 8 in 1988) to capture the effects of possible time trends.[7] In all, there were 3,349 observations, the number of companies declining through time because of take-over and other forms of 'death'. Thus, by 1988, our sample was less representative of the very largest companies than it had been in 1981.

However, the requirement that companies be listed on The Stock Exchange in order to remain in the sample ensures that it still represents the upper end of the audit market.

The sources of data were Datastream for accounting data and the *International Stock Exchange Official Yearbook* for number of principal subsidiaries and identity of auditor. A series of articles by Boys (1989 and 1990) was used to ensure that changes of name or amalgamation of auditing firms were not mistakenly identified as changes of auditor. The basic variables used in the study are described below. Other variables were derived from them by a process of cross multiplication, as described in the next section.

The dependent variable in all of our studies is Audit Fee, *F*. This is the audit fee charged in group accounts and does not include the auditor's remuneration for other services rendered (disclosure of which has been required only very recently in the UK), but it does include fees paid by subsidiary companies to auditors other than the auditor of the holding company.

Two size variables were collected, in accordance with the discussion in the section above headed, Models of the Determinantion of Audit Fees. These are Sales, *S* and Assets, *A*. Sales is group sales to third parties arising from ordinary trading activities, and excluding Value Added Tax. Total Assets is total assets of the group with no liabilities deducted. Another balance sheet measure of size was also used, because of its use in previous studies. This is Total Debtors plus Stocks, *W* (working capital), which is arguably a more precise measure than Total Assets of work required by the auditor.

Two additional audit cost variables were collected. Pre-tax profits, *P*, was used as a possible audit risk variable, although, as discussed earlier, this could also be an ability to pay variable. To overcome the latter difficulty a dummy variable P_d was calculated, which is equal to one when profits were negative and zero otherwise. This might possibly capture audit risk more clearly by identifying the loss-making situation which might be expected to incur a high risk premium. The second additional audit cost variable is complexity, *C*. This is the total number of subsidiary companies in the group.

The two experimental variables collected are both derived from the identity of the auditor. The first, the Big 8 variable *B*, is a dummy variable equal to one when the auditor is a member of the Big 8 (the reduction to six having occurred after the end of our observation period) and equal to zero when the auditor is non-Big 8. When the audit is shared between a Big 8 and a non-Big 8 auditor, this variable is arbitrarily set to one-half. The Change of Auditor variable, D, is derived from the same source and is also a dummy variable, equal to one when the auditor has changed, zero when there is no change, and one-half when one of two joint auditors have changed. At a later stage, we experimented with more refined change of auditor variables, distinguishing between type of auditor (Big 8 and Non-Big 8).

Table 1 provides descriptive statistics of the variables defined above. Our dependent variable, Audit Fee, averages £425,860, with a maximum of £7 million and a minimum of £4,000, and the standard deviation is greater than the mean. Thus the distribution is positively skewed, with a long upper tail of high fees. This reflects a similar pattern in our two auditee size variables, Assets and Sales, and also in Profit, which should also be related to size of firm. The average size of these three variables (Assets £509 million, Sales £694 million and Profit £48.4 million) reflects the fact that our sample is drawn from the largest listed companies. The Debtors and Stocks variable (*W)* also exhibits positive skewness and indicates the large size of the firms studied (the average of Debtors plus Stocks is £207 million).

Table 1

Descriptive Statistics of the Main Variables

Variable	*Notation*	*Mean*	*Standard Deviation*	*Minimum*	*Maximum*
Audit Fee	*F*	425.860	703.970	4	7,000
Total Assets	*A*	509,360	1,829,600	1,043	34,057,000
Sales	*S*	694,340	2,393,900	1,499	47,156,000
Profit	*P*	48,383	180,500	−125,600	3,613,000
Time Trend	*T*	4.173	2.255	1	8
Complexity	*C*	18.311	17.399	0	160
Auditor Change	*D*	0.022	0.143	0	1
Big 8 Auditor	*B*	0.695	0.456	0	1
Debtors & Stock	*W*	207,410	613,650	453	10,504,000

Notes:
[1] All rows are based on 3,349 observations.
[2] The first four rows (*F, A, S* and *P*) and the last *(W)* relate to financial variables which are expressed in £'000s.
[3] The remaining four variables (*T, C, D* and *B*) represent discrete events (year, number of subsidiaries, change of auditor, Big 8 auditor).

Turning to the discrete variables, the Time variable, *T*, averages 4.173, rather than 4.5 (which would be its average for a company which continued over the full eight years) because of the loss of companies from the population in the later years. The Complexity variable, C, which measures the number of subsidiaries, varies between zero and 160, with an average of 18.31, which suggests positive skewness. Thus, although this variable is defined in discrete terms, it provides a fairly good approximation to a continuous measure of complexity. The remaining two variables, Big 8 *(B)* and Change of Auditor *(D)* are (with the minor exception of shared audits) dichotomous dummy variables. Thus, the average value of 0.022 for Auditor Change *(D)* indicates that, on average, the probability of any audit in any year being in the hands of a new auditor was only slightly over two per cent, or, more vividly, that the auditor might expect to retain the audit for 50 years. The latter inference must, however, be tempered by the fact that we exclude discontinuity of companies, which is probably a major cause of termination of auditors' tenure of office. The average value of the big 8 variable *(B)* indicates that slightly over 69 per cent of the audits in the sample were done by Big 8 auditors. The prevalence of Big 8 auditors is unsurprising given that the sample covers the largest listed enterprises, which might be expected to favour the Big 8.

Table 2

Correlation Matrix

	F	*A*	*S*	*P*	*T*	*C*	*D*	*B*	*W*
Audit Fee, *F*	1.00								
Total Assets, *A*	0.67	1.00							
Sales, *S*	0.67	0.98	1.00						
Profit, *P*	0.73	0.87	0.86	1.00					
Time, *T*	0.12	0.08	0.07	0.10	1.00				
Complexity, *C*	0.35	0.10	0.11	0.10	0.10	1.00			
Auditor Change, *D*	−0.00	−0.00	0.01	−0.01	0.00	0.01	1.00		
Big 8 Auditor, *B*	0.20	0.12	0.10	0.12	0.11	0.09	0.05	1.00	
Debtors & Stocks, *W*	0.77	0.96	0.95	0.89	0.07	0.16	0.00	0.14	1.00

Notes:
[1] The correlations are based on 3,349 observations.
[2] The correlation coefficients are simple Pearsonian product moment coefficients. As the matrix is symmetrical about the diagonal, only the bottom half is reported.

Table 2 presents a matrix of Pearsonian correlation coefficient between the main variables. In interpreting these, it must be remembered that they measure the total correlation between each pair of variables, unlike the partial correlations (which allow for the effects of other variables) which arise from multiple regression analysis. This limits severely the extent of the inferences which we can draw. For example, there are high correlations between all of the variables which reflect firm size (*F, A, S, P* and *W*, i.e. all those measured in absolute monetary terms), but all that we can infer from this is that large firms tend to have large monetary attributes, not that there is a direct causal relationship between the variables. Equally, the largest correlations involving discrete variables are those between Complexity and the Big 8 variable, respectively, and Fee. We would expect size to be a factor in these correlations also, since larger firms will tend to have more subsidiaries (higher C) and to have a higher proportion of Big 8 auditors. However, the correlation matrix does serve as diagnostic evidence for the subsequent multiple regression analysis. In particular, it may warn us against possible multicollinearity. The only case in which this seems to be a possibility is in the correlation between Sales and Assets, where the coefficient is 0.98.

ESTIMATION

The broad form of the model which we wish to estimate was defined above in the section headed Models of the Determination of Audit Fees. For initial estimation purposes, we define the model in as parsimonious a form as is consistent with our aims. The precise form of the equation estimated is as follows:

$$F_{it} = a + b.S_{it} + c.S_{it}^2 + d.A_{it} + e.A_{it}^2 + f.P_{it} + g(T.A)_{it} + h(C.A)_{it} + j.B_{it} + k(B.S)_{it} + l(B.S^2)_{it} + m(B.A)_{it} + n(B.A^2)_{it} + p(B.P)_{it} + q(B.T.A)_{it} + r(B.C.A)_{it} + s(D.A)_{it} + v(B.D.A)_{it} + \epsilon_{it} \quad (3)$$

where *F* is audit fee,

a, b, c, d, e, f, g, h, j, k, l, m, n, p, q, r, s and *v* are parameters,
S is Sales,
A is Total Assets,
P is pre-tax Profits,
T is a Time variable (=1 in 1981 and 8 in 1988),
C is Complexity (number of subsidiaries),
B is a dummy variable indicating a Big 8 auditor,
D is a change of auditor variable (indicating the first year of a new auditor),
ϵ is a stochastic error term, and
brackets indicate interaction variables, formed by multiplying together the basic variables described earlier.

The explanation of each term is as follows. The constant term, a, represents the fixed cost of setting up an audit, irrespective of the attributes captured by the other variables. In the subsequent ordinary least squares (OLS) estimation process, it can also serve as a 'catch all' term to capture specification errors, such as omitted variables or mis-specification of functional forms. The following four parameters, *b, c, d* and *e,* capture the quadratic effect of auditee size, measured in two dimensions, Sales *(S)* and Assets *(A),* as discussed above. The next term captures the effects of Profits *(P),* which we have discussed as a possible measure of audit risk (if *f* is negative).

The interactive term, Time multiplied by Assets, *(TA),* captures the possible real change over time in audit charges. Changes in money terms due to general inflation are likely to affect equally the dependent variable and the monetary explanatory variables (*S, A* and *P*), so that they do not require special treatment in the model. The interactive term *CA* captures the effect of complexity. It is hypothesised that greater complexity is likely to lead to greater fees in a larger auditee (measured by *A*), rather than having a constant effect independent of auditee size. It is possible that both the time trend *(T)* and complexity (C) affect audit fees in other ways, and we shall later test the possibility that they have a fixed effect in addition to an effect varying with auditee size.

The following eight terms (related to parameters *j, k, l, m, n, p, q* and *r*) attempt to assess the big 8 effect on each of the factors already included in the model. Each of the previous terms is multiplied by the Big 8 dummy variable (B), so that the relevant parameter measures the shift in the previous parameter due to the Big 8 effect. Thus, the linear effect of Sales on Fee for a Big 8 audit firm will be *b+k,* whereas for a non-Big 8 auditor it will simply be *b*. We have allowed *B* to affect all of the other variables in the model because it is a variable of central experimental interest.

The final two terms introduce the Change of Auditor variable *(D)* in an attempt to identify the low-balling effect. For the initial model, we use the term *DA* as the principal means of capturing this effect. It is assumed that low-balling will involve a greater fee reduction for a larger auditee (as measured by *A*), rather than being constant, although at a later stage we shall introduce a constant term also. The final term, *BDA*, multiplies the previous term by the Big 8 variable, *B*, with the object of identifying whether Big 8 firms indulge in low-balling to a greater extent (indicated by a negative estimate of υ) or a lesser extent (positive υ) than other audit firms.

Problems of Estimation

Equation (3) was estimated by a standard OLS procedure. This led to an unacceptable degree of heteroscedasticity (as indicated by the Breusch-Pagan test). Although previous researchers have not reported this problem, this is unsurprising because they have typically performed a logarithmic transformation on the dependent variable and certain explanatory variables. For reasons given above in the section headed Models of the Determination of Audit Fees, we found this type of *ad hoc* transformation to be inconsistent with our model.

Two possible approaches to heteroscedasticity are possible. The first is to do a simple transformation of the model by dividing every variable by a size measure. Two possible size measures were available, Sales *(S)* and Assets *(A)*. Both were used as deflators, and in each instance the evidence of hetero-scedasticity was markedly reduced (the greatest reduction being when *A* was the deflator), but it was not possible to reject the hypothesis of heteroscedasticity at an acceptable level of statistical significance.

Thus, the alternative approach had to be adopted. This is to carry out a statistical correction for heteroscedasticity. Two methods were considered: the White method (White, 1980) and the Harvey method (Harvey, 1976). The White approach relies on the fact that, in the presence of heteroscedasticity, the OLS point estimates of the parameters are unbiased and consistent, although not efficient. It thus assumes that the point estimates are correct and, on this assumption, provides a generalised covariance matrix estimate of the standard errors of the coefficients. Without such an adjustment, the standard errors are biased downwards and the t-statistic is biased towards rejection of the null hypothesis. The White standard errors, on the other hand, are consistent. The White method does not assume any particular form of heteroscedasticity.

The Harvey method, on the other hand, does assume a particular form of heteroscedasticity and relies on other assumptions which may not hold. It is therefore of less general validity than the White method. However, it does have the possible advantage that the point estimates are re-estimated, making them more efficient. This is not an important consideration in the present study, in which we have 3,349 observations and can therefore rely on the asymptotic properties of the unadjusted point estimates. We therefore prefer the more general White method for adjusting the standard errors. The results of using this method to estimate our basic model are reported in column 1 of Table 3, and the same method will be used in estimating all subsequent variations of the model.

Another possible piece of econometric pathology, discussed earlier, is multicollinearity. This has the effect of 'exploding' the standard errors because there is insufficient variation between a pair of explanatory variables to allow accurate estimation of their independent effect. The most likely case of this, identified in the correlation matrix (Table 2) was the correlation between Sales *(S)* and Total Assets *(A)*. The fact that the standard errors on *S* and *A* in Table 3 are statistically significant at an acceptable level suggests that this is not a serious problem.

Interpretation of the Results

Taking the White method as our preferred method of estimation, we concentrate initially on the point estimates of Table 3, column 1.

The following broad conclusions emerge:

(i) As expected, the coefficients on the two size variables (*S* and *A*) are positive and statistically significant. They indicate that size of auditee is a major determinant of audit fees and that both dimensions of size are important, contrary to the assumption of earlier studies of audit fees. Ignoring the quadratic terms, the coefficient on Sales implies that, other factors being equal, audit fees increased by 0.0157 per cent of each monetary unit of Sales, and that on Assets implies that fees rose by 0.0461 per cent of each monetary unit of Assets audited.

(ii) The quadratic terms S^2 and A^2 have negative coefficients which would be consistent with economies of auditee scale in auditing. However, in neither case is the coefficient statistically significant at an acceptable level. We are thus unable to assert with confidence that economies of scale exist in auditing.

(iii) The Profit variable, P, has a negative coefficient, which would be consistent with this variable being a measure of audit risk. The coefficient is quite large bearing in mind the small average of Fee relative to *P* (implying that a £1 increase in *P* is associated with a £0.0008 decrease in *F*), but it is not statistically significant. We cannot therefore reject the null hypothesis that profit levels do not affect audit fees.

(iv) The time trend variable, *TA*, has a negative coefficient and its *t*-value is extremely small. We therefore do not have evidence to support the hypothesis that there is a time trend in the real level of audit fees (expressed as charge per £ of assets audited).

(v) The complexity variable *(CA)* has a positive coefficient which is statistically significant. We are thus able to confirm our expectations that greater complexity *(C)* leads to higher audit charges, and that this effect is greater for larger auditees (as measured by assets, *A*).

Table 3

Modifications and Extensions of the Regression Model

Explanatory Variable	*Regression Coeficients*					
	Basic Model (1)		*Modified Model (2)*		*Extended Model (3)*	
Constant	71.916	(10.63)*	25.433	(1.44)	17.345	(0.85)
S	0.157×10^{-3}	(2.27)*	0.673×10^{-4}	(2.12)*	0.370×10^{-4}	(1.04)
S^2	-0.174×10^{-10}	(−1.10)	0.107×10^{-12}	(0.07)	0.235×10^{-4}	(1.41)
A	0.461×10^{-3}	(3.17)*	0.285×10^{-3}	(3.10)*	0.479×10^{-3}	(5.76)*
A^2	-0.215×10^{-10}	(−0.99)	-0.134×10^{-10}	(−3.38)*	-0.185×10^{-10}	(−4.39)*
P or P_d	-0.802×10^{-3}	(−1.00)	0.418×10^{-3}	(0.66)	−69.321	(−5.25)*
TA	-0.548×10^{-5}	(−0.28)	-0.739×10^{-5}	(−0.97)	-0.145×10^{-4}	(−1.77)
CA	0.996×10^{-5}	(7.64)*	0.903×10^{-5}	(6.51)*	0.755×10^{-5}	(5.02)*
B	141.140	(10.04)*	100.810	(8.68)*	107.210	(9.04)*
BS	-0.983×10^{-4}	(−1.24)	—	—	—	—
BS^2	0.175×10^{-10}	(1.10)	—	—	—	—
BA	-0.174×10^{-3}	(−0.90)	—	—	—	—
BA^2	0.798×10^{-11}	(0.37)	—	—	—	—
BP or BP_d	0.207×10^{-2}	(2.16)*	0.891×10^{-3}	(1.45)	−62.550	(−3.76)*
BTA	-0.895×10^{-6}	(−0.04)	—	—	—	—
BCA	-0.493×10^{-5}	(−2.88)*	-0.494×10^{-5}	(−3.69)*	-0.255×10^{-5}	(−2.42)*
DA or *D*†*A*	-0.687×10^{-3}	(−2.65)*	-0.799×10^{-3}	(−5.41)*	-0.695×10^{-3}	(−6.04)*
BDA or *D*8*A*	0.518×10^{-3}	(1.64)	0.657×10^{-3}	(3.67)*	-0.978×10^{-4}	(−0.94)
c	—	—	4.060	(5.69)*	3.090	(3.67)*
T	—	—	3.569	(1.12)	8.238	(2.25)*
D or *D*†	—	—	−4.266	(−0.09)	−19.639	(−1.70)
*D*8	—	—	—	—	8.689	(0.19)
P_dA	—	—	—	0.169×10^{-2}	(5.02)*	
BP_dA	—	—	—	—	-1.101×10^{-4}	(−3.02)*
$\bar{R}^2$	0.767		0.773		0.754	

Notes:

[1]* *t*-value statistically significant from zero at the five per cent level.

[2] Each pair of columns contains point estimates in the first column and *t*-values in the second. The standard errors are consistent estimates based on White (1980).

[3] For the third model ('Extended Model'), the dummy variable P_d is substituted for *P*, *D*† is substituted for *D* and *D*8 is substituted for *BD*.

(vi) The Big 8 variable, *B*, has a large positive coefficient, suggesting that, other things being equal (i.e. holding the other explanatory variables constant) a Big 8 auditor would charge £141,140 more than a non-Big 8 auditor. However, this has to be tempered by the effect of the Big 8 interaction variables, discussed below. The coefficient on *B* is statistically significant, so that the evidence appears to be strongly in favour of a Big 8 effect.

(vii) However, taking account of the Big 8 interaction with size produces a much less clear picture. None of the four coefficients on the size interation variables (*BS, BS2, BA* and BA^2) is statistically significant. Moreover, the coefficients on the two quadratic terms (BA^2 and BS^2) have positive signs which would not be expected if Big 8 firms were relatively inexpensive for the largest audits.

(viii) There is a statistically significant positive Big 8 interaction with profit *(BP)* indicating that Big 8 firms charged *relatively* more to profitable auditees than did smaller audit firms. However, this has to be offset against the negative (non-significant) coefficient on *P,* so that we cannot say with confidence that Big 8 firms charged *absolutely* more to their more profitable auditees.

(ix) There is a very small negative coefficient on the Big 8 interaction with the time trend *(BTA),* which is not statistically significant. Thus, there is no evidence of a relative upward drift in Big 8 charges.

(x) There appears to be a strong and statistically significant interaction between the Big 8 and Complexity (BCA). The coefficient is negative, confirming our expectation that the Big 8 charge less for complexity than smaller auditors. The value of the coefficient suggests that the Big 8 charge approximately half of the premium which other auditors would charge for complexity (the Big 8 discount is estimated as 493/996).

(xi) There is evidence of a low-balling effect. The coefficient on the change of auditor variable *(DA)* is negative, and statistically significant, indicating that auditors in their first year of office charge significantly less than other auditors. The size of the coefficient is sufficient to offset entirely the positive linear effect of auditee assets (4) on audit fees, but it must be remembered that auditee size is also represented by other explanatory variables in our model. The coefficient on the Big

> 8 interaction with change of auditor *(BDA)* is positive, suggesting that the low-balling is less pronounced when the new auditor is a member of the Big 8. This coefficient is not statistically significantly different from zero, but its size is sufficient (0.000518) to offset substantially the sign on the coefficient on *DA* (−0.000687). Thus, newly-appointed Big 8 auditors charge only slightly less than incumbent auditors. This is, of course, still consistent with low-balling if we accept that new auditors have greater set-up costs.

It should also be noted that the constant term is statistically significant and positive. This is consistent with there being positive fixed costs to doing any audit, but the coefficient is high, suggesting a fixed charge of £71,916, which is much higher than the observed minimum audit fee. This suggests that the constant term is also partly a reflection of specification errors in the model, although these may be due to the fact that our observations relate only to large audits, so that extrapolation back to zero size is inappropriate. Finally, the value of $\bar{r}^2$ indicates that slightly over three quarters (76.7 per cent) of the variance of audit fees is explained by our model. This is a considerable proportion, but the unexplained proportion is large enough to justify the further experimentation to improve the model, which will be described later.

The results reported above suggest a number of modifications and extensions to the model.

Model Modifications

The most obvious modification is to delete the interaction of the Big 8 variable with size (*BS, BS*^{2}, *BA* and *BA*^{2}), and the time trend *(BTA).* These interactions demonstrated no clear pattern across different methods of estimation and no statistically significant coefficients using the White method, and their deletion would simplify the model considerably.

A second modification is to add terms for complexity *(C),* the time trend *(T)* and change of auditor *(D).* Each of these variables appeared in only one interaction term in the original model (*TA, CA* and *DA*). The latter two yielded statistically significant results and we should therefore explore the slightly more sophisticated form of using an additional term for each. With regard to the time trend variable *(TA),* this did not yield a statistically significant result in the previous analysis, but in a mixed time-series cross-section panel it is important to allow for possible shifts through time and the additional term is therefore potentially useful in correcting possible specification errors.

The second section of Table 3 gives the results of these two modifications to the model. The modified model performed slightly better in terms of goodness of fit ($\bar{r}^2$), so that there has been a net gain from substituting the three new variables for the six Big 8 interaction variables. One of the new variables, complexity *(C)* has a positive and statistically significant coefficient, suggesting an average additional audit fee of £4,060 per subsidiary *(C).* The coefficient on the time trend *(T)* suggests an average upward drift in audit fees of £3,569 per audit per year but this is not statistically significant at the five per cent level. The size interaction with complexity *(CA)* retains its positive, statistically significant coefficient, although the value of the coefficient is reduced by comparison with the previous model. The time interaction variable, *TA,* remains close to zero and not statistically significant.

The change of auditor effect continues to yield a statistically significant negative coefficient on *DA* suggesting a low-balling effect, and the partially offsetting positive coefficient on *BDA* is now statistically significant, confirming more strongly the previous conclusion that Big 8 auditors tend to low-ball to a lesser extent than non-Big 8 auditors. The coefficient on the new term, *D,* is not significantly different from zero, so that there is no evidence of a change of auditor discount on the fixed costs of an audit (i.e. independent of audit size).

The effect of the size variables is different in the modified model. These differences occur as a result of deleting the Big 8/size interaction variables, although the results of this interim step are not reported here. The coefficient in the quadratic sales term *(S^2)* is positive, which would imply decreasing returns (i.e. increasing unit costs as size of audit increases) if we were able to accept it as statistically significantly different from zero. Assets, on the other hand, retains its negative quadratic term *(A^2)* which we can now accept as statistically significant. This suggests that there are economies of scale in the

Asset dimension of auditing. The break even point at which the marginal cost of auditing with respect to assets becomes negative is assets of approximately £21,269 million, which is below the highest observed, but only eight observations are above this level so that there is no serious anxiety about mis-specification.

The effects of the other variables are substantially the same as in the basic model. However, the modified model has a much lower positive constant term (implying an average fixed cost of £25,443 per audit) and this is not statistically significantly different from zero. This suggests that the specification of the modified model may be superior to that used previously, which yielded an implausibly high constant term.

Extensions

The extensions to our model involve alternative definitions of two variables and the introduction of another. The variables which are re-defined are Profitability, *P*, and the change of auditor variable, *D*. The variable which is added is the Stocks plus Debtors variable, *W*.

The previous results have reported no consistent effect of auditee profit on audit fees, apart from a tendency for Big 8 firms to charge more to clients with higher profits. The Profit variable may have a dual role as a measure of auditee risk (lower profits may increase risk and audit costs) and as a measure of ability to pay (higher profits may increase auditee willingness to pay higher audit fees). It might be possible to distinguish these effects if they occur at different levels of profit, e.g. if the audit risk is notably increased when profits are negative and the 'ability to pay' effect is predominant when profits are high. Our particular interest is to capture the costs imposed by audit risk, and we therefore considered an alternative measure of profitability which identified loss-making (negative profits) as a dummy variable P_d, equal to one for a year in which the auditee made a loss, and zero otherwise. There were 260 cases of P_d= 1 out of 3,349 observations.

The second re-definition relates to the Change of Auditor variable, *D*. Our earlier analysis relied on a measure of *D*, which included all cases of auditor change. We then created another variable, *BD*, by multiplying by the Big 8 variable. This did not achieve precisely the desired result in the small number of cases in which audits were shared. We therefore re-defined the Change of Auditor variable as two separate variables, one *D*† describing a case of change where the new auditor was not a Big 8 firm, and the second, *D*8, describing those cases where the new auditor was a Big 8 firm. The following is the incidence of changes of each type:

D†=0, *D*8=0, No auditor change	3,267
D†=1, *D*8=0, Change to non-Big 8 auditor	11
D†=0, *D*8=1, Change to Big 8 auditor	71
Total	3,349 cases.

The third section of Table 3 reports the results of substituting these alternative definitions into the modified model (now described as the Extended Model). An interactive variable

P_dA was also added to capture a possible variation of the loss-maker's premium (or discount) according to size of audit and a further term (BP_dA) was added to allow this effect to be different for Big 8 auditors. The results are substantially similar to those obtained for the modified model, except in the case of the re-defined variables and the coefficient on Sales (S), which falls and loses statistical significance. The coefficient on P_d is negative whereas that on P was positive, but this would be expected since P_d is a loss indicator rather than a profit measure and thus introduces a change of sign. Of more interest is the fact that the coefficient on P_d is statistically significant. This suggests that loss-making leads to a discount on audit fees, and contradicts the hypothesis that it acts as a risk measure which increases audit costs, confirming rather our earlier 'ability to pay' interpretation. The coefficient on BP_d is negative and statistically significant, which confirms our earlier result that the 'ability to pay' effect was higher among large auditors. However, the coefficient on P_dA is positive and statistically significant, although in the case of Big 8 auditors this effect is lower, because of the negative coefficient on BP_dA. This implies that the discount was reduced for large audits, ultimately becoming a premium (the break-even being at Assets of £41 million where the auditor was non-Big 8 and £194 million where the auditor was a Big 8 firm, which is considerably below the population mean). On the other hand, the redefined change of auditor variable does not change our earlier conclusions. The coefficient on *D*†*A* is similar to that on *DA*, the corresponding variable in the previous model, indicating a clear fee reduction when a non-Big 8 auditor is appointed. The coefficient on *D*8*A* shows that there is also a smaller reduction in fee when a Big 8 auditor is appointed and that this is not statistically significantly different from zero. This also is consistent with the results of the previous model, in which it was necessary to deduct the 'Big 8' coefficient (on *BDA*) from the 'change' coefficient *(DA)* to obtain the net effect of a Big 8 firm obtaining a new audit.

The final extension to the model was to add the Stocks plus Debtors variable, *W*, to the analysis. This variable has two potential roles. Firstly, as an additional variable reflecting the costs of the audit (since Stocks and Debtors may be a particularly onerous element of Total Assets, from the auditor's point of view), or, secondly, as a substitute for the Asset measure of Size *(A)*.

When *W* was added to the basic model as an additional linear variable, it had a positive, statistically significant coefficient, and the coefficients on *A* and *S* both fell (although both were still positive) neither being statistically significant. When *W* was added to the modified model and the extended model, again the coefficients on *S* and *A* were no longer statistically significant. This suggested that *W* should be used as an alternative measure of size, substituting for *A*, of which it is a component, rather than as an additional variable in the model.

When *W* was substituted for the previous asset measure, *A* (Table 4) the general conclusions of the basic model (Table 3, section 1) were unchanged, apart from those relating to the size effect: the sales variable, *S*, no longer had a statistically significant coefficient, and the coefficients on *W* and W^2 were statistically significant and had signs consistent with economies of scale (positive on *W* and negative on W^2). This suggests that *W* captures both the asset *(A)* and the sales *(S)* dimension of size, which is plausible because it is a component of *A* and its own components (Stocks and Debtors) are likely to

be a function of *S*. When *W* was substituted for *A* in the modified model, most of the previous results (Table 3, section 2) still held, but the sales effect was changed, there being a negative coefficient on *S* and a positive coefficient on S^2, the former being statistically significant. This is a counter-intuitive result, suggesting that, at lower levels of *S*, a marginal increase in *S* actually reduces the audit fee. The other coefficients were not changed in any striking way. Finally, substituting *W* for *A* in the extended model also leads to the linear coefficient on *S* becoming negative although not statistically

Table 4

Regression Results Substituting Stock Plus Debtors (W) for the Asset Variables (A)

Explanatory Variable	*Regression Coefficients*					
	Basic Model (1)		*Modified Model (2)*		*Extended Model (3)*	
Constant	35.045	(6.88)*	14.086	(0.88)	4.022	(0.22)
S	-0.373×10^{-4}	(−0.71)	-0.873×10^{-4}	(−2.15)*	-0.700×10^{-4}	(−1.32)
S^2	-0.311×10^{-11}	(−0.27)	0.205×10^{-11}	(1.83)	0.910×10^{-12}	(0.50)
W	0.226×10^{-2}	(8.32)*	0.138×10^{-2}	(6.90)*	0.157×10^{-2}	(6.85)*
W^2	-0.435×10^{-9}	(−4.44)*	-0.149×10^{-9}	(−5.36)*	-0.113×10^{-9}	(−3.20)*
P or P_d	-0.658×10^{-3}	(−1.46)	0.631×10^{-3}	(1.13)	−53.020	(−3.63)*
TW	0.995×10^{-5}	(0.30)	-0.274×10^{-4}	(−1.21)	-0.146×10^{-4}	(−0.65)
CW	0.235×10^{-4}	(6.47)*	0.268×10^{-4}	(7.06)*	0.226×10^{-4}	(5.05)*
B	139.990	(10.14)*	81.295	(7.15)*	97.982	(8.47)*
BS	-0.753×10^{-4}	(−1.04)	—	—	—	—
BS^2	0.563×10^{-11}	(0.48)	—	—	—	—
BW	-0.821×10^{-3}	(−2.09)*	—	—	—	—
BW^2	0.279×10^{-9}	(2.70)*	—	—	—	—
BP or BP_d	0.221×10^{-2}	(3.18)*	0.904×10^{-3}	(1.55)	−48.130	(−2.72)*
BTW	-0.347×10^{-4}	(−0.80)	—	—	—	
BCW	-0.145×10^{-4}	(−3.50)*	-0.193×10^{-4}	(−5.45)*	-0.154×10^{-4}	(−4.23)*
DW or *D*†*W*	-0.228×10^{-2}	(−8.69)*	-0.198×10^{-2}	(−7.14)*	-0.195×10^{-2}	(−7.40)*
BDW or *D*8*W*	0.237×10^{-2}	(6.79)*	0.212×10^{-2}	(6.62)*	0.171×10^{-4}	(0.14)
c	—	—	3.005	(5.55)*	2.769	(4.36)*
T	—	—	6.723	(2.19)*	8.851	(2.54)*
D or *D*†		—	−32.813	(−1.16)	−6.558	(−0.59)
*D*8	—	—	—	—	−18.352	(−0.53)
P_dW	—	—	—	—	0.234×10^{-2}	(3.39)*
BP_dW	—	—	—	—	-0.178×10^{-2}	(−2.55)*
$\bar{R}^2$	0.799		0.800		0.772	

Notes.
Notes 1 to 3 of Table 3 apply.

significant, which again is counter-intuitive. Otherwise, the values and signs of the coefficients and their statistical significance are consistent with those derived from using the Asset measure (third section of Table 3).

CONCLUSIONS

The overall conclusions which emerge from the empirical results are as follows:

(1) With regard to the determinants of audit charges, *auditee size* is of fundamental importance. We found some evidence to support our suggestion that size could be measured in two dimensions, assets and sales, but this was not robust to model specification. An asset measure (either total assets or stocks plus debtors) always had a significant influence on audit fees, and in our modified and extended models sales had a negligible independent influence. There was fairly strong evidence for economies of scale with respect to auditee size (a statistically significant negative coefficient on the quadratic term in assets).

(2) With regard to other determinants of audit charges, *complexity*, as measured by number of subsidiaries, always had a positive and statistically significant effect on audit fees. *Profit* had an effect which was sensitive to model specification. In its unadjusted form it tended to have a positive influence on fees, suggesting the 'ability to pay' interpretation of fee setting, particularly for large audit firms. When it was reduced to a dummy variable for loss making, in an attempt to isolate its influence as an audit risk variable, we obtained a rather complex result: small loss-making auditee firms receive a discount on their audit fee, but larger loss-making firms are charged a premium by their auditors. This result is worth further exploration. It is possible that the switch between large and small auditees is due to the greater potential loss accruing from the distress of a large client (e.g. higher legal damages and greater adverse publicity), but it is also possible that loss-making is seen as a better predictor of distress in large business firms, which should be well-diversified and better insulated against business risk. This effect was stronger amongst small audit firms, which suggests that large (Big 8) audit firms are more willing (or more able) to help clients through loss-making periods by reducing fees, and less fearful of the consequences of the failure of a large client.

(3) With regard to other aspects of the *Big 8 effect*, Big 8 audit firms were, on average, more expensive than non-Big 8 firms. However, their premium for complexity was less than that charged by the non-Big 8 firms, suggesting that they are relatively efficient in doing complex work. No systematic pattern of evidence was observed with respect to a possible Big 8 differential in charges for size of audit. We are thus unable to conclude that the Big 8 are relatively inexpensive in doing large audits, or that their charges for the variable costs associated with size of audit are different from those of smaller audit firms.

(4) With regard to *low balling*, we identified a persistent tendency, robust across models, for newly-appointed auditors to charge less, on average,

than incumbent auditors. This was particularly pronounced in the case of newly-appointed auditors who were not members of the Big 8. However, the Big 8 also charged slightly less when newly appointed (although not to a statistically significant extent), and it is possible to argue that low-balling takes place whenever the new auditor does not charge a *premium* to cover set-up costs (Grout, 1991).

Apart from the specific conclusions drawn above, it is hoped that our discussion of the specification of audit fee models will encourage further empirical work using the specification which we have proposed, rather than the logarithmic specification which has been favoured in previous studies.

NOTES

1 The Big 8 were Arthur Andersen, Coopers and Lybrand, Deloitte Haskins and Sells, Ernst & Whinney, Peat Marwick Mitchell, Price Waterhouse, Touche Ross, and Arthur Young. As a result of mergers, Ernst & Young has been formed from Ernst & Whinney and Arthur Young, and Deloittes has merged with Coopers and Lybrand in the UK and with Touch Ross elsewhere.

2 A useful survey of empirical audit fee models is provided by Chan, Ezzamel and Gwilliam (1991).

3 Addition of logarithms implies multiplication of the underlying variables, which is why logarithmic transformation is so popular in many econometric applications, such as the estimation of production functions. The implications of this are not discussed in the empirical studies of auditing.

4 A less appealing feature is that a negative coefficient on the quadratic term means that at some size level the cost curve will start to turn down, indicating negative marginal cost. However, we would expect this to occur at a size level above any which actually exists, and extrapolating the regression line beyond the limits of actual observation is not appropriate.

5 On the other hand, fee resistance by auditees having temporarily bad performance may lead to fees falling below cost in some instances.

6 Palmrose (1986a) introduces a third category of audit firms, national firms which are not members of the Big 8. This is a more refined application of the same principles which we discuss here.

7 In addition, a set of year-specific dummy variables was generated for each year other than the base year (1981). This was substituted for T in all of the main regression models reported in Table 4, in order to detect any non-linear time trends. The results were not statistically significant in the overwhelming majority of cases.

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Section III
Price change accounting

Inflation Accounting

All The Answers

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For the past year and a half I have been a Social Science Research Fellow in Inflation Accounting. The inevitable response of others to this information is an empty stare which indicates that, if they are accountants, they are bored to tears by the whole subject, or, if they are not accountants, that they cannot think of anything less likely to interest them: the accountant's reaction is one of informed boredom, and the non-accountant's one of uninformed boredom, but both groups are certainly bored by the subject. As each member of this audience is undoubtedly either an accountant or a non-accountant, the prognosis for this lecture does not seem favourable.

However, politeness usually overcomes boredom, and the empty stare is usually followed by that bright expression which often accompanies the creation of a witty and original thought, namely 'Oh, and I suppose that you are going to tell us all the answers'. At this point, it is my turn to assume an empty stare, not only because I have heard the comment before, but also because I am aware that the implication is that I am expected, after my two years' contemplation in the wilderness, to return bearing golden tablets (or at least a fat manuscript) inscribed with *the* solution to the problem of inflation accounting. There is a common assumption amongst many practising accountants and laymen (but not amongst academic accountants) that there is a simple, correct solution to the problem of inflation accounting. It is therefore natural that they should assume that I have been sent by S.S.R.C. on an expedition to find this undiscovered treasure, and that they should be disappointed if I do not return with it.

The main purpose of this lecture is to demonstrate that the phrase 'all the answers' is, in this instance, appropriate in its literal, rather than its colloquial sense. There is not a single method of inflation accounting which will provide 'all the answers', which is what is popularly expected. Rather, there are many methods of inflation accounting, each of which is capable of providing an answer (but not necessarily a perfect one) to one or more questions which might be in the minds of users of accounting data. There are many such questions, and many answers. This demonstration cannot pretend to great originality, but its message is mainly hidden, at present, in the academic literature. It bears repeating to a wider audience for the benefit of at least two constituencies. Firstly, the accounting practitioner, who, as a busy practical man, has little time for reading or contemplation, and whose working life would be made much easier by the imposition of a single system, preferably as simple as possible to implement. He needs to be persuaded that life is too complicated to allow simple panaceas. Secondly, academics who are not accountants are inclined to think that accounting is a very simple subject, concerned only with the mechanics of double-entry book-keeping, and posing no problems worthy of the attention of an academic discipline. This view also indicates a lack of appreciation of the subtlety of the problems involved. I imagine that representatives of both groups are present in this audience.

Before plunging into the complications of the subject, it would be as well to define it more precisely and explain why it is important. Accounting can be defined broadly as the provision of information relating to economic transactions. For present purposes, I shall narrow this to exclude the problems of national income accounting and of non-business organisations. I shall only be concerned with the accounts of business organisations. I shall also confine my remarks to the financial accounts rather than the management accounts of these organisations. Financial accounts are the accounts which have traditionally been drawn up on a periodic basis, usually for a year or six months, mainly

for the benefit of the providers of finance of the company, i.e. the shareholders and the creditors. In the case of most companies, these accounts are sent to all shareholders and are available for public inspection by creditors, and other interested parties. In recent years, more stress has been laid on the category of 'other interested parties',[1] and financial accounts and reports are expected to meet the requirements of a widening group of users, including employees, the government and the general public. Management accounts serve a much more clearly defined constituency, the management of the company, and provide information which is relevant to decision-making within the firm. The form of management accounts is not prescribed by law and varies greatly between companies and between different types of decision. The correct treatment of price changes in management accounts is obviously of great importance, and one motive for recognising inflation in financial accounts is to make management aware of its consequences, in the hope that they will then allow for changing prices in their management accounts and decisions. The reason for avoiding specific issues in management accounting here is merely one of simplicity. In fact, the simple example subsequently used involves a business so simple that the need for special management accounts is limited.

Why does inflation accounting matter? Here, I can call upon the assistance of Lord Bowden, who gave a stimulating and controversial lecture on this subject at University College, Cardiff in 1974.[2] Essentially, inflation accounting matters because some important decisions are based on the information given in financial accounts: inflation can distort the information and therefore misdirect these decisions. In particular, a number of important decisions depend on reported profits, such as the decision by the directors to declare dividends to shareholders, and that by the tax authorities to levy taxes. During periods of price restraint, the profit reported in the accounts may be used as a criterion for pricing policy, price increases being allowed only if they are necessary for the achievement of an adequate profit. The monopolies and restrictive practices legislation also uses reported profits as one criterion to be considered in assessing whether a company in a monopolistic situation is over-charging the consumer. Reported profits may also affect the outcome of wage negotiations, a common defence against high pay claims being that the company cannot afford to meet them, and the profit figure being taken as an indication of the company's prosperity. Reported profits may also affect the supply of finance to the firm. Equity shareholders will take them as an indicator of the firm's capacity to pay dividends and potential lenders will regard them as an indication of the company's capacity to repay the amount lent, and, where relevant, meet the interest payments. Ideally, of course, suppliers of finance and other users of financial accounts would like to know future returns rather than past profits, but, given the difficulties of forecasting the future and the possibilities of manipulating forecasts to mislead the user, the most recent figure for achieved profits is usually regarded as the most relevant piece of 'hard' information which is available… although, as we shall see, it may not be as 'hard' or as relevant as we would wish.

The main object of discussing the various uses of financial accounts, and, in particular, the profit measures which appear in them, was to establish that financial accounting has important uses, and that the adjustment of this information to allow for the effects of inflation is therefore potentially an important issue because poor information can lead to poor decisions. However, there is a secondary lesson to be learned: it is unlikely that one

piece of information and, in particular, one profit figure (often referred to in the literature as an 'income number') will meet all of the wide variety of needs which financial accounting is meant to satisfy. For example, it is not necessary that the measure of profit used for tax purposes should be the same as that used by a shareholder to assess the economic performance of the company over a particular period: the fact that corporation tax is currently assessed on a different basis from the profits reported to shareholders under the Companies Acts testifies this. Yet the debate on inflation accounting is bedevilled by the implicit belief on the part of many participants that a single number can be found which will provide 'all the answers'. This problem is compounded by the fact that most of the individual questions potentially have a number of answers: the correct method of assessing corporation tax, for example, is a controversial issue,[3] and, in an uncertain world, the assessment of economic performance is probably best done by resort to a variety of complementary measures rather than a single number, which gives a spurious impression of precision.

Now, let us be a little more precise about what we mean by inflation, and what is its effect on accounting. We would all agree, I think, that inflation has to do with rising prices. We would also agree that, in Britain at present, most prices seem to be rising more rapidly than we would wish. The cost of living has quadrupled in the past twelve years, and the fear of rising prices is so strong that the Government is willing to tolerate a level of unemployment which is unprecedented in the past four decades, rather than risk an increase in the rate of inflation. Looked at from another point of view, inflation implies a decline in the purchasing power of money, due to an increase in the general level of prices. Since money is the conventional unit of measurement used in accounting, a decline in its purchasing power must inevitably raise difficulties in comparing accounting measurements made at different times.

Precisely what we mean by 'the general level of prices' is a controversial issue. We usually measure this in terms of a price index which seeks to reflect the cost of living of an average citizen, but, of course, the index represents the cost of living strictly only for an individual who buys commodities in proportion to their weighting in the index; a non-smoking, teetotal vegetarian, for example, might consider inappropriate to his needs a consumer price index which includes tobacco, alcohol and meat. However, this type of objection assumes less importance at higher rates of inflation, at which most prices tend to move upwards, and fiat money tends to be a less satisfactory measure of purchasing power than a 'real' unit calculated by reference to an index, for all but the most perverse of consumers. Thus, it is not a coincidence that it has been in countries with persistently high rates of inflation, such as Brazil in recent years, that the use of indices to alleviate the distortionary effects of inflation has been most popular. It was a historically unprecedented level of inflation which led to a limited experiment with indexation of wages in the United Kingdom, in the so-called 'threshold agreements' of 1973/4.

Lest this discussion of the nature of inflation seems to be a somewhat oblique and academic approach to inflation accounting, it should be pointed out that the government committee, the Sandilands Committee, which was appointed to investigate inflation accounting came to the conclusion that there is no such thing as a general price level. They were thus denying that inflation, as it is popularly understood, exists: if there is no general price level, then there can be no changes in the general price level, but merely

changes in individual prices. This attitude has helped to confuse the subsequent debate, particularly insofar as it concerns the treatment of items of fixed money value.

Before an overdue excursion into practical examples of how inflation might affect accounts, it is important to draw the distinction between changes in the general price level and changes in the prices of specific commodities relative to the price level. The former represents the effects of inflation, whereas the latter can occur even when inflation does not occur. Thus, suppose the price of a specific commodity rises from £1 to £1.20p. If this rise takes place when an acceptable general price level index, measuring inflation, rises by 10 per cent, we would attribute 10p of the rise to inflation and 10p to relative price change. If the inflation index rose by 20 per cent we would attribute all the rise to inflation, but if there were no inflation we would attribute all the rise to relative price change.

Now for our overdue example. This is inspired by a leading practitioner in Bristol who, at a conference in which we both participated, attempted to justify the system of current cost accounting (CCA), recently enforced by the Accounting Standards Committee,[4] in the following terms:

> 'It's all quite simple really. Imagine old Fred, who's a street trader. One morning he goes to the wholesale market and buys a hundred pineapples for £1.00 each. He sells them for £1.50 each, so he works out his profit for the day by the traditional historical cost method, as:
>
> | | £ |
> |---|---|
> | Sales | 150 |
> | *less* Cost of Goods Sold (at historical cost) | 100 |
> | Profit | 50 |
>
> He feels that he has had a successful day and goes to the pub and spends his £50 profit. The next day, he arrives at the wholesale market and finds that, while he was selling his pineapples the previous day, the wholesale price had risen to £1.25. He looks into his pocket and realised that he has only £100 to spend, so that he can't replace his stock of 100 pineapples: he can afford only 80 pineapples. On the other hand, if he had done current cost accounting, he would have calculated his profit after charging the current replacement cost of his pineapples:
>
> | | £ |
> |---|---|
> | Sales | 150 |
> | *less* Current Cost of goods sold | 125 |
> | Profit | 25 |
>
> He would then have spent only £25 in the pub, and he would have preserved enough cash to maintain his capital stock of 100 pineapples.'

This simple tale was no doubt adequate for its purpose of communicating the spirit of current cost accounting, and my object is not to offer carping criticism of it, but to demonstrate a few implicit assumptions which lie behind even this simple and apparently innocuous problem. Before doing this, it should be noted that financial accounting is normally concerned with periods greater than one day, but those who are dissatisfied with this can pretend that the period is a year rather than a day. Equally, those who find Old Fred and his pineapples a rather unimportant corner of the economy can pretend that Old Fred is their favourite oil company and that the figures are expressed in millions of pounds. A more serious objection to the example is that Old Fred holds only cash at the end of the day, whereas most companies hold fixed assets and stocks of goods: we shall return to this problem later, when it will be shown to add to the variety of answers which are available to the problems of inflation accounting. Now, let us turn, at last, to an analysis of Old Fred's problem, beginning with some objections which might be raised against the case which was made out of preferring Current Cost Accounting (CCA), over the traditional Historical Cost (HC) method.

Firstly, Fred might well object that he started the day with £100 in cash and ended with £150. Surely, then, he has gained an income of £50 which he is entitled to spend, leaving himself as well off at the end of the day as at the beginning, with £100. After all, he did not actually spend the £125 charged as cost of goods sold under the current cost accounting system.

The reply to this, by the advocates of CCA, is that the difference between the £100 actually paid and the £125 is a holding gain, the rise in the cost of his stock of pineapples between when he bought them and when he sold them. This is Fred's reward for buying early when prices were lower, rather than later, when they were higher. It should not be regarded as part of his profit, but rather as a 'capital gain'; something which must be preserved (rather than being spent in the pub) if he is to maintain the substance of his business (100 pineapples).

Fred's reply to this might well be that he does not care about maintaining a stock of pineapples: he is in business to make money, not to accumulate a heap of perishable stock. Furthermore, if pineapples have become relatively expensive in the wholesale market and the retail price has not risen proportionately, he might prefer to switch to oranges, or some other potentially more profitable line, and his £100 might buy even more oranges today than it did yesterday.

It thus transpires that our CCA advocate supports the *entity* view of the business: its physical substance, either in terms of assets or that seductive but elusive concept 'productive capacity', must be maintained before we recognise an increase in the value of the assets of the business as giving rise to a profit which is regarded as a suitable object for distribution (as dividends in the case of an oil company, at the pub in the case of Fred) or taxation. This point of view has been associated, in the recent debate on inflation accounting, with Messrs Merrett and Sykes, who have made a number of eloquent and apparently influential[5] pleas for a concept of physical capital maintenance, based upon the need to protect the operating capacity of British industry against the ravages of taxation and excessive dividends which might result from the 'paper profits' reported by traditional accounts in a period of inflation. This concept has a natural appeal for managers and other employees whose jobs may depend upon the preservation of the operating capacity of the business.

Fred, on the other hand, is an advocate of the 'proprietary' view of the business, which is not surprising, since he is the proprietor. This views the business as a financial fund administered by the management for the benefit of the proprietors, who provide the finance. On this view, the objective of the business is not to maintain its productive capacity, but to maximise the wealth of the proprietors, and a profit is an increase in the wealth of the proprietors. The dispute between these two points of view explains a great deal of the controversy on inflation accounting, but we must, having raised the issue, pass on to yet further complications.

It will be observed that the example so far has not taken any account of inflation in the sense described earlier. If we assume that inflation was zero, or negligible, during the period (which is plausible if we assume it to be a day), then no adjustment is necessary. Thus, CCA cannot be simply a system of inflation accounting, since it produces different figures from those of traditional HC even when there is no general inflation. This is because CCA deals with *specific* price changes, which, as we found earlier, can be due to *general* price level changes (inflation or deflation) or to *relative* price changes, or both. If we assume no inflation, our example is one solely of relative price changes (pineapples relative to other goods).

At the other extreme, we might assume that the rise in the price of Fred's pineapples was attributable entirely to general inflation: this is more plausible if we assume that the period is a year rather than a day, although high daily rates of inflation have occurred, e.g. in the German hyper-inflation of 1923. In such a case, we might say that Fred was wrong, even on his own 'proprietary' assumptions, because he failed to take account of the declining value of the monetary unit. His wealth in this case can be measured in pineapples, since they represent constant command over other goods and services. After maintaining this wealth intact, he has £25 left over to spend, and, incidentally, these current pounds will buy him only four-fifths of the number of pints of beer which they would have bought before the inflation price rise.

However, it is more plausible to assume that inflation exists but at a rate different from that of the change in the price of a specific commodity, such as pineapples. In such a case, Fred should aim to maintain his 'real' wealth, i.e. his command over goods and services in general (not pineapples specifically) before recognising a profit, if he takes the proprietary view. Thus, if we assume that inflation took place at 10 per cent,[6] we would regard Fred's closing capital requirement as £110 and his profit as £40. His profit calculation could be re-cast as follows:

	£
Sales	150
less Historical cost of goods sold, in current £'s	110
Profit	40

The purchases have been re-stated to allow for the fact that, since purchase, the £ has effectively been devalued, so that the cost of the original purchases expressed in current £s must be increased to be equivalent (£100×110/100). This is an example of Constant Purchasng Power (CPP) accounting, as advocated by the accounting profession in 1973.[7]

An alternative way of presenting this would be

	£
Sales	150
less Current cost of goods sold	125
Operating profit	25
add Real holding gain on stock	15
Profit	40

This yields the same profit figure as CPP in this instance,[8] but it tells the story of how the profit was made in a different, and possibly more revealing manner, which might help Fred towards a better understanding of the sources of his gains. First, we are told Fred's current cost operating profit (£25): this is the cash profit which he would have made had he bought back his stock at current prices. However, he bought early and cheap, saving money by doing so. This holding gain was £25 in money terms, but we deduct from this the £10 allowance for inflation, the general devaluation of money which has taken place since the purchase. If we wanted to be yet more informative, we would distinguish in our profit statement between the nominal holding gain (£25) and the adjustment for inflation (£10). This is the profit and loss account associated with a real terms accounting system, which combines the useful features of both CCA and CPP. It has a respectable intellectual history, having been advocated by the great pioneer of inflation accounting, H W Sweeney, in the early nineteen thirties, and by some of the most important theoretical writers since then, such as Edwards and Bell (*The Theory and Measurement of Business Income,* University of California Press, 1961). It was also advocated in practice by the Consultative Committee of Accountancy Bodies in their initial response to the Sandilands Report (1975), and certain features of it are incorporated in the current United States standard on accounting for changing prices (*FAS33,* 1979). However, it must ultimately stand or fall by its own merits, rather than its respectable ancestry, and one important merit stands out: it is capable of telling Old Fred rather more than either of the simpler but narrower answers stated earlier. Of course, if he is content with a simple and narrow answer, there is no point in providing him with a more complicated one, but, if it is accepted that there is something to be said for both the CPP and CCA solutions, a system which combines the two seems to avoid an invidious choice.

However, our choice of capital maintenance concepts does not end here. In the United Kingdom at present, the 'real terms' method of allowing for inflation within a CCA system has been rejected in favour of a gearing adjustment. This would not affect Fred in our example as it has been stated to date, because he has no 'gearing', i.e. his business is not financed by borrowing. However, let us now suppose that half of his £100 has been lent to Fred by his Aunt Mabel, or, if you prefer to think in grandiose terms, suppose that our oil company is financed by £50 million equity shares and £50 million loan stock. To keep matters simple, we shall assume that no interest is payable on the loan. The HC statements of profit and loss will be unaffected by the existence of the loan, if no interest is paid: profit remains at £50. Under the CCA system, equally, there will be no change, if no gearing adjustment is made. Under the CPP and real terms systems, if we assume inflation at 10 per cent, Fred's profit will now be £45. This is because he now has to put aside only £5 to maintain the real value of his initial capital (£50): the remainder of the capital was provided by Aunt Mabel, who will require payment only of 50 depreciated

pounds, not of the real purchasing power she invested (which she would have preserved by investing in Granny Bonds, i.e. 55 depreciated pounds). Thus, Fred has made a 'gain on borrowing' of £5.[9] The precise figuring is as follows:

CPP	£
Sales	150
less Historical cost of goods sold, in current £'s	110
Operating profit	40
add Gain on borrowing	5
Total profit	45

Real terms	£
Sales	150
less Current cost of goods sold	125
Operating profit	25
add Real holding gain on stock	15
Gain on borrowing	5
Total holding gains	20
Total profit	45

The 'gain on borrowing' represents the loss of general purchasing power of the nominal pounds which Fred owes to Aunt Mabel: her loss is his gain. The greater the rate of inflation, the more important will this item become.

There is, however, another way of looking at this problem, namely the 'gearing adjustment', which is incorporated in the current United Kingdom accounting standard, SSAP 16. This takes the view that the gain or loss on borrowing should be related not to changes in the general purchasing power of money (a concept which extreme advocates of **CCA,** such as the Sandilands Committee, reject) but to changes in the prices of the specific goods and services bought by the firm. Thus, in Fred's case, the gain on borrowing would be related to the change in the price of pineapples, a 25 per cent increase, which, on a loan of £50, amounts to a gain of £12.50p. The way this is introduced is through the gearing adjustment:

Geared Income	£
Sales	150
less Current Cost of Purchases	125
Operating profit	25
add Gearing adjustment	12.50
Geared income	37.50

The gearing adjustment is calculated by multiplying the 'realised holding gain', i.e. the difference between what Fred paid for his pineapples and what they would have cost him at the time of their sale (£125−£100=£25), by the geared proportion, i.e. the proportion of

loans to Fred's total finance (£50/£100=0.5). This sounds convoluted, and it is, but it is also an ingenious way of introducing a gain on borrowing into the CCA system without making use of a general price index.

Of course, the gearing adjustment does not produce the *same* gain on borrowing as the 'real terms' system. The reason is that the gearing adjustment does not recognise the effect of general inflation in eroding Fred's own equity capital but rather assumes that he must maintain his share of the physical capital. Thus, on his share of the capital he cannot recognise any holding gain on his pineapples as profit. The real holding gain on the pineapples financed by his capital (half of the total real holding gain) is £7.50: this is the difference between real terms profit and geared profit, the latter failing to recognise the gain as profit.

I do not favour the gearing adjustment, because it seems to be an uneasy mixture of the proprietary and entity concepts of capital maintenance. Particularly arbitrary is the splitting of real holding gains into those which can be recognised as income because they are loan financed and those which must be capitalised because they are equity financed. There are also a number of technical difficulties in its implementation (how does it apply to unrealised holding gains, do we calculate gearing on the basis of the opening balance sheet, or as an average for the year, do we regard preference shares as equity or loans? etc.). The same could be said of a corresponding adjustment, the monetary working capital adjustment, which is incorporated in the present U.K. standard. However, a theoretical justification of the gearing adjustment is possible: perhaps its most persuasive advocate is Professor Charles Kennedy.[10] The main purpose of this discussion is not to denigrate the gearing adjustment but to show that it represents yet another alternative view as to how Fred might calculate the capital which must be maintained intact before recognising a profit.

A final alternative, which would find strong support in economic theory, is that Fred need not require any particular configuration of assets to be maintained intact. Rather, he should look to the future and regard as his income as 'the maximum amount the individual can spend this week, and still expect to be able to spend the same amount in each ensuing week' (J.R.Hicks): if inflation is anticipated he would wish to define his spending in real terms, i.e. in terms of constant command over goods and services. In this case, Fred's assessment of his income would depend upon the future course of prices in general, the cost of pineapples and the selling price of pineapples. For example, he might regard the £50 which he spent at the pub as profit if he expected the next day to buy 80 pineapples for £1.25 and sell them for £1.94 each to give receipts of £155 (approximately) and a surplus of £55, i.e. £50 with compensation for an anticipated 10 per cent inflation, with similar adjustments in future selling prices to compensate for rising costs and inflation.

This might seem to be relevant to a small businessman like Fred, but not to a large public company, but this is not so. The shareholder's return on his shares is the dividend (unless the firm goes into liquidation) and he will value the shares as a claim to a future dividend stream. If we translate 'able to spend' into 'able to distribute as a dividend', the concept becomes relevant to the company, and the sustainable constant 'Standard Stream' dividend is a useful device for valuing shares. An annuity of this type can be valued simply by dividing by an appropriate discount rate. Thus, if the sustainable dividend on a particular share is £1 per annum and the appropriate discount rate (allowing for risk and,

if the return is defined in nominal rather than real £s, inflation) is 10 per cent, then the value of the share is £1/0.1=£10. The most persuasive advocate of the 'standard stream' approach to financial reporting is the economist, Mr M F G Scott, who has argued for its relevance to share valuation as one of its particular merits (in *Some Economic Principles of Accounting: A Constructive Critique of the Sandilands Report,* Institute for Fiscal Studies, 1976).

We have now found that poor Old Fred's financial affairs are more complicated than he originally might have thought. Despite starting the day with cash and finishing with cash, thus avoiding the problems of valuing stocks and fixed assets which commonly afflict trading and manufacturing businesses, he still faces a choice of five approaches to defining the capital to be maintained before he recognises a gain in his resources as profit. These are:

1. Money capital (as in traditional HC)
2. Physical capital (as in CCA operating profit)
3. Real capital (as in CPP or 'real terms')
4. Geared capital (as in the current UK version of CCA)
5. That capital which will maintain future consumption or dividends.

We could add to this complicated picture by discussing asset valuation, if we chose to endow Fred with assets other than cash at the end of the day, e.g. supposing that he had some unsold pineapples. Apart from the traditional historical cost method (HC is what Fred actually paid for his pineapples), we have two other types of market values, 'entry values' which would represent the cost to the business of acquiring the assets (in Fred's case, the price of pineapples in the wholesale market) and 'exit values' which would represent the amount realisable by their being sold by the business (in Fred's case, the price which his retail customers are prepared to pay for pineapples). Then, in the case of fixed assets (those held for use in the business over a number of accounting periods) the economist's method of valuation may be appropriate: the asset is valued at 'net present value', i.e. the discounted present value of the future benefits which the firm will derive by using the asset. The valuation of shares by reference to a standard stream of expected dividends, described earlier, was an example of such a calculation. Finally, there are eclectic methods of valuation which use one or other of these methods depending on the circumstances. The current British and U.S. standards, for example, make use of the Value to the firm' concept: assets are valued at replacement cost (an entry value) or 'recoverable amount' (the higher of exit value, or net present value in use), whichever is the lower.

The complications do not end here. Each of the broad methods of valuation described above contains a variety of alternatives. For example, if we choose entry value, do we estimate the replacement cost of the specific asset, or the replacement cost of the service provided by the asset, which may, as a result of technical change or relative price changes, be most economically provided by a different asset? If we choose exit value, do we choose selling price in the ordinary course of business (which must take time), or do we choose the immediately realisable price in enforced liquidation (which may involve offering a substantial discount to induce customers to come forward immediately)? If we choose discounted present value, what future use do we envisage for the asset (its present use or a more profitable alternative which may offer itself in the future) and how do we

assess the appropriate discount rate? Added to these conceptual problems are the practical ones of subjectivity: current values are often described as ‘soft’, lending themselves to manipulation by unscrupulous preparers. However, historical cost involves some difficulties and is not as ‘hard’ as its advocates might wish.

Beyond these difficulties are the fascinating problems of allocation and aggregation, which have been rigorously and elegantly exposed by the work of Arthur L.Thomas. In valuing used assets, where secondhand values are not readily ascertainable, we may have to resort to ‘writing off as depreciation a proportion of the price of a new equivalent asset just as, in the traditional historical cost system, a proportion of original cost is written off. This raises the time allocation problem, that any allocation of the cost of the asset to specific periods (in order to determine how much of the asset has been used up) is arbitrary in cases in which the purchase of the asset is essentially the purchase of the asset’s services over its whole lifetime, not for separable sub-periods. Equally, we may be faced with a different type of allocation problem, occurring between assets rather than between time periods, when we calculate net present values. When a number of assets are engaged in a joint productive process, we may face the problem of allocating the joint return between individual assets. The allocation problem is concerned with dividing or allocating a joint product amongst the factors which were responsible for producing it, or allocating a shared factor amongst its various products. The aggregation problem involves the reverse process of assembling the whole from the sum of its parts. Thus, if we aggregate a set of individual asset values, we face the problem of interpreting the total: is the total equal to the total value of the firm, and if not what is its significance? This question is obviously important in relation to profit measures which start by comparing the total of closing assets with the total of opening assets. Here, we encounter the problem of goodwill: what is its nature and how can it be measured?

However, Fred, and possibly this audience, have suffered enough. The object of this lecture has not been to reduce the listener to a state of despair (although it might inadvertently have done that), but rather to point out that financial accounting in general and inflation accounting in particular face difficulties which are more complex than is popularly supposed. These problems do not lend themselves to simplistic solutions of a general purpose type, but this does not mean that they are not amenable to logical investigation or that their importance cannot be assessed by empirical research. This is a plea for more research, not less: anything else would be a betrayal of my profession!

What future developments in inflation accounting seem desirable in view of this discussion? Despite the complications and the variety of problems and solutions, or questions and answers, some clear lessons do emerge. Firstly, the search for single numbers, such as an income measure, should be abandoned in favour of a search for a set of information, different parts of which will be relevant to different users of the information, for different purposes, or under different conditions and assumptions. The example of ‘real terms’ accounting in Old Fred’s case, demonstrated how two methods of accounting could be combined in a single statement to produce complementary information. A variety of more sophisticated formats for achieving this and other objectives was proposed nearly twenty years ago by Edwards and Bell (1961). More recently, Professor Kennedy (1978) has demonstrated how the present U.K. system of current cost accounting could incorporate an appropriation account which would show a variety of income measures which might be useful for different purposes, such as forming

a basis for taxation, the dividend decision, pricing policy, or *ex post* appraisal of the economic success of the business. In the practical sphere, the current cost accounting standards presently operating in both the U.K. and the U.S.A. contain elements of such an approach. Even the recent Inland Revenue *Discussion Memorandum* on stock relief may be viewed favourably in this context: some bodies (including, apparently, the Consultative Committee of Accountancy Bodies[11]) have criticised the proposal that stock relief should, in future, be based upon a general index adjustment rather than on the current cost of goods sold, appearing in CCA accounts. However, the CCA accounts are prepared primarily for the benefit of the shareholders and creditors as investors in the company, whereas the Inland Revenue is concerned to assess tax in a manner consistent with the Government's objectives and in such a way that it is even-handed between different companies and between the company sector as a whole and the rest of the economy. There is no reason to believe that the information required by investors should be identical to that required by the Inland Revenue.

Research has a great deal to offer in sorting out the problems associated with defining an appropriate set of information. Theoretical research is needed to test the consistency of the arguments for providing certain types of information and to clarify the assumptions upon which they are based. Particular attention needs to be paid to the precise information requirements of specific decisions, in order to liberate accounting thought from the constraints of searching for general purpose numbers. Empirical research also has a rôle to play in testing both the assumptions and the consequences of different accounting methods, e.g. in the United Kingdom the work of Peasnell and Skerratt, and Bourn, Stoney and Wynn (reviewed in the *Background Papers to the Exposure Draft on Current Cost Accounting,* Tolley, 1976), has given valuable insights into the extent and form of temporal deviations of specific fixed asset prices from a general index (an important issue in asset valuation), and in the U.S.A. some important work has been undertaken recently into the impact of replacement cost information on share prices (e.g. see the recent symposium in *The Journal of Accounting and Economics,* 1980). The empirical field is particularly rich in research topics. Useful theory relies on making realistic assumptions and dealing with matters which are of material importance, yet in practice a great many decisions by standard setting bodies appear to be made on the basis of impressionistic empirical information and under the pressure of Evidence' submitted in public comments, which may be little more than self-serving pleas by interested parties.

In conclusion, I hope that I have convinced you of four things:

(1) That inflation accounting is an interesting subject.
(2) That it is important.
(3) That it does not lend itself to simple 'general purpose' solutions.
(4) That it is nevertheless an area which would repay more research.

REFERENCES

[1] e.g. In *The Corporate Report* published by the Accounting Standards Steering Committee in 1975, and the Government Green Paper, *The Future of Company Reports.*
[2] *Inflation Accounting,* the first Ewan Davies lecture, University College, Cardiff, 1974.
[3] This is discussed further in the Report of the Meade Committee, of which the lecturer was a signatory.
[4] *Statement of Standard Accounting Practice No. 16,* 1980.
[5] For example, an article of theirs was very influential in persuading the Government to introduce Stock Relief in 1974, as an emergency measure to prevent the taxation of stock appreciation, the rise in monetary value of stocks held during a period (£25 in Old Fred's case).
[6] Here we implicitly assume a discrete jump in the general price level between the purchase of the pineapples and their sale. Otherwise, we would have to adjust the sales figure upwards to current £s, offsetting this adjustment by a 'loss on holding money'.
[7] Exposure Draft 8, *Accounting for Changes in the Purchasing Power of Money,* 1973.
[8] This is because Fred does not have any stocks or other assets on which unrealised holding gains could occur. If this were the case, it would be necessary to exclude unrealised real holding gains or losses from profit if the identity between the two profit figures were to be maintained. This approach seems to be favoured by Professor Baxter in his excellent book on the subject, *Accounting Values and Inflation* (McGraw-Hill, 1975).
[9] There is a corresponding loss on holding money in a period of inflation, which we avoid in this example. See footnote (6).
[10] Particularly in his 1978 article, published in *The Cambridge Economic Policy Review,* No. 4.
[11] Report in *Accountant's Weekly,* 9 January 1981, p. 4.

The European Contribution to Inflation Accounting

Geoffrey Whittington

1. Introduction

When the current cost accounting (CCA) standard, *SSAP16*, was issued in March 1980 there was a degree of self-congratulation in British professional circles because it seemed that Britain[1] led Europe, if not the world, in this field. The only other country in the world which had a current cost accounting standard at this time was the USA, whose *FAS 33*, embracing both current cost and current purchasing power adjustments, had been issued four months earlier, but *FAS33* did not require current cost balance sheet data so that, in one important respect, the USA could be said to be behind Britain. In any event, it seemed that standard practice in the Anglo-Saxon world was far ahead of that in continental Europe, since the other English-speaking countries all had recommendations or exposure drafts in hand which promised to lead to standards compatible with *SSAP16* or *FAS33*.

Since 1980, any complacency which existed in British professional circles has been disturbed by recent developments, both within the profession (notably the very close vote of members of the ICAEW on the future of current cost accounting in the summer of 1982) and outside it (most notably the rejection of current cost accounting as a basis for Stock Relief against corporation tax, and the negative attitude to CCA as a tax base, expressed in the 1982 Green Paper on Corporation Tax). Our present purpose is not to explore this latest phase of the inflation accounting debate, but to provide a more balanced picture of the contribution of continental Europe to both the theory and the practice of inflation accounting. Throughout the paper, inflation accounting will be broadly defined to include both the CCA and CPP approaches.

We shall proceed as follows. Firstly, in section 2, we shall survey the current state of inflation accounting practice in Europe, which does provide a superficial basis for Anglo-Saxon complacency. Secondly, in section 3, we shall consider developments in both the theory and the practice of inflation accounting between the two world wars, when continental Europe led the world in this field. Thirdly, in section 4, we shall examine developments since the Second World War and demonstrate that continental European experience contributed significantly to developments in the Anglo-Saxon world, and to those in Latin America, which can claim to lead the world in CPP accounting. Finally, in section 5, we shall consider what continental Europe and the Anglo-Saxon world might still be able to learn from one another, and what might be learned from a deeper comparative study of the experience of different countries.

[1] Strictly, the British Isles, since the Accounting Standards Committee embraces the Institute of Chartered Accountants in Ireland, whose members have made an important contribution to the "British" debate.

The broad scope of the paper inevitably means that the level of description and analysis of various systems and authors must be superficial and, for greater depth, the reader is recommended to study the forthcoming book, *The Debate on Inflation Accounting* by David Tweedie and Geoffrey Whittington (Cambridge University Press, 1984). This paper is based on material gathered in the course of writing the book.

2. The European Scene in 1983[2]

At the present time, the only country of continental Europe which has a signficant degree of practice of some form of inflation accounting is the Netherlands. Dutch replacement cost accounting owes its intellectual origins to Professor Th. Limperg (whose work will be considered further in the next section). It has been adopted for financial reporting purposes by a number of companies in the period following the Second World War, and most notably by Philips.

However, the Dutch philosophy of financial reporting has been essentially permissive, relying on the professional judgement of the independent auditor rather than upon detailed statutory regulation. This has permitted the growth of replacement cost accounting but it has also meant that the precise form is not standardised and that many companies choose not to use replacement cost at all. The official guidance by the professional body (NIVRA), published in 1976, suggests that income be reported on both the current cost and the historical cost basis and that an indication should be given of the amount necessary to maintain shareholders' interest in terms of general purchasing power. Since this statement has the status of advice rather than being an enforceable directive, it has had little impact on practice. NIVRA's 1979 survey of 120 company accounts showed that 7 per cent of companies gave full current (or replacement) cost accounts (including balance sheets), 41 per cent used partial current cost adjustments, and 52 per cent published their main accounts on the historical cost basis (although almost half of these disclosed some current cost information in notes).

No other continental European country has a widely practised form of inflation accounting, although professional guidelines on the subject have been issued in France and Germany, and an ambitious exposure draft has been issued in Sweden.

In France, financial reporting is inhibited by the requirement that published accounts are the basis for taxation. Until 1962, asset revaluations carried tax incentives and were quite frequent. Since then, they have carried tax penalties and have therefore been infrequent, apart from a required revaluation of the fixed assets of listed companies in 1976. Thus, French current practice in financial accounts is historical cost, tempered by occasional revaluations. However, *supplementary* disclosure of inflation accounting information would be permitted without tax penalty, and in 1981 the professional body (Ordre des Experts Comptables et des Comptables Agrees) issued a non-mandatory *Opinion* recommending such disclosure. This *Opinion* was pragmatic and eclectic, suggesting three adjustments to profit: depreciation based on historical cost adjusted by a general index (CPP adjustment), cost of goods sold based on replacement cost (a CCA

[2] The material in this section is largely based upon the research of my co-author David Tweedie.

approach) and an adjustment to reflect the purchasing power gain or loss on net monetary assets (a CPP adjustment). Experimentation with alternative methods was encouraged. There is, as yet, no evidence that the *Opinion* has made a significant impact on practice: its permissive nature and the lack of tax incentives suggest that such an impact is unlikely to occur.

In the Federal German Republic, the form of published accounts is tied by statute to a conservative historical cost base. However, as in France, supplementary disclosure of inflation accounting information would be permitted, and in 1975 the professional body (IdW) issued proposals for such disclosure. The IdW proposals were essentially of a replacement cost variety and were confined to adjustments to the profit and loss account to disclose replacement cost depreciation and replacement cost of goods sold. These two adjustments were to be abated by a gearing adjustment, reflecting the extent to which the relevant assets were financed by loan capital.[3] However, in terms of current practice these proposals have had no impact. They have not been followed mainly because the climate of opinion in the country is strongly opposed to inflation and its manifestations, such as inflation accounting. This attitude owes its origins to the experience of hyper-inflation in the 1920's, which will be discussed in the next section of this paper.

In Sweden, the professional body (FAR) produced an exposure draft on Current Cost Accounting in 1980. This recommended a "real terms" measure of income, combining a current cost valuation base with an adjustment for the maintenance of the real purchasing power of shareholders' equity (using a general price index). This owes a great deal to the ideas of Edwards and Bell (1961) and is consistent with (although more comprehensive than) the current standard in the USA *(FAS33)*. However, the exposure draft has yet to become a standard and to influence practice.

Thus, with the exception of the Netherlands, continental Europe does not currently practice any form of inflation accounting, and even in the Netherlands there is considerable diversity of practice.[4] In contrast to this situation, some form of inflation accounting has been practised in Great Britain and Ireland since the mid-1970's, when a number of companies published the supplementary CPP statements recommended by *PSSAP7* (1974). Since then, the *Hyde Guidelines* (1977) have led to many leading companies producing basic current cost profit information and *SSAP16* (1980) has extended this to require current cost balance sheet information, in addition to a current cost profit and loss account. The USA is the only other country to have made comparable progress towards achieving standard practice of current cost accounting, although three Latin American countries (Brazil, Chile and Argentina) have CPP requirements.

[3] These proposals are discussed in detail by Coenenberg and Macharzina (1976).

[4] It should be emphasised that we have confined the discussion to financial accounting. As we shall see, Dutch and German writers have emphasised the relevance of replacement cost in management accounting, and European practice may be relatively advanced in this area.

This should not, however, be taken to imply that continental Europe has made no contribution to inflation accounting and is waiting passively for the English-speaking world to show what can be done. On the contrary, we shall show in the next section that, to a significant extent, the systems currently being applied in the English-speaking world owe their origins to leading continental European accounting theorists, particularly those who were active in the period immediately following the First World War.

3. Inflation Accounting between the World Wars, 1918 -1939

The origins of inflation accounting, in both theory and practice, can be traced to before the First World War. For example, Germain Boer (1966) has provided a fascinating account of the late-nineteenth century controversy as to whether railways in the USA should be allowed to base their charges on a replacement cost or a historical cost basis.[5] In the realm of theory, Irving Fisher's *The Purchasing Power of Money*, the seminal treatise on price indices which was quoted by most pioneers of CPP accounting, was first published in the USA in 1911. Continental European writers of this period include the German, Emil Fäs (1913) and the Finn, Kovero (1912), both of whom published works on replacement cost accounting.

However, it is clear that the most important phase in the development of inflation accounting was stimulated by the high level inflation which followed the First World War, particularly in Germany, but also in France and the Netherlands. During this period, the main ideas of both CCA and CPP accounting were developed by continental European writers. The two outstanding pioneers of CCA accounting were the German, Fritz Schmidt, whose replacement cost system included a profit measure very close to that subsequently advocated by the Sandilands Report (1975) in the United Kingdom, and the outstanding Dutch theorist, Theodore Limperg, whose replacement value accounting system provided the inspiration for subsequent Dutch practice, which, in turn, provided an example for standard-setters in other countries. The outstanding pioneers of CPP ideas were to be found in Germany and France. Perhaps the best known is the German, Schmalenbach, although his pupil, Mahlberg (1923), developed a more sophisticated system (Sweeney, 1936) and the French writers of the 1920's, such as Leger, explored alternative CPP techniques more thoroughly than any others (Wasserman, 1931) to such an extent that Sweeney postponed the completion of his classic monograph on inflation accounting in order to assimilate their ideas (Sweeney, 1936).

Rapid inflation also caused experimentation with various forms of inflation accounting during this period, notably in Germany, where the hyper-inflation rendered some form of adjustment imperative. The result was that stabilisation of balance sheet values[6] in terms of the gold Mark, a unit of constant gold value, became common practice in Germany during the period culminating in the currency reforms of 1923–24. Later, a more stable

[5] Clarke (1982) provides a more recent critical commentary on this controversy.

[6] The balance sheet was regarded as the primary financial statement at this time, both in Europe and in the USA.

currency led to less need for stabilised accounting, but the ideas were preserved, notably by Sweeney, the great pioneer of CPP systems, who studied and built upon the German experience (Sweeney, 1927 and 1928). Thus, the experience of the 1920's had an important impact on future developments abroad, although, ironically, in Germany itself, the experience of hyper-inflation resulted in the strong aversion to inflation and all its manifestations, which has inhibited the subsequent development of inflation accounting.

Sweeney's classic work, *Stabilized Accounting* (1936), distilled and refined the most important ideas and techniques to emerge from the European experience of the 1920's and served as the basis for many of the subsequent developments in the Anglo-Saxon world. Thus, there was a substantial continental European contribution to the development of inflation accounting in the English-speaking world following the Second World War. Sweeney, as the title of his book suggests, regarded inflation, in the sense of depreciation of the general purchasing power of money, as the primary problem. This emphasis on general price changes arose naturally out of the high inflation rates experienced in the early 1920's in the countries which he studied, and this led him to emphasise the importance of the CPP technique, which he refined and expounded very clearly in his work. However, Sweeney was also influenced by replacement cost writers, notably by Schmidt, and in Chapter 3 of his book, he advocated replacement cost as an ideal valuation basis, with general index adjustment being applied to the measurement of capital, in calculating income. In this chapter, Sweeney succeeded in combining general and specific price adjustments, showing that the two were not mutually exclusive, as their European advocates were inclined to argue. Thus, Sweeney's most original contribution was probably to pioneer the type of accounting model subsequently developed, in a more sophisticated form, by Edwards and Bell (1961).

However, the aspect of his work which Sweeney himself valued most highly, and which had the most immediate impact, was his development of CPP accounting, applying general indices to the historical cost base. These ideas were subsequently adopted and popularised by a pamphlet published by the American Accounting Association (Mason, 1956) and by a Research Study published by the American Institute of Certified Public Accountants (*ARS6,* AICPA, 1963), which became the basis of the Accounting Principles Board's CPP recommendation of 1969 *(APB3),* and the FASB's exposure draft of 1974, and the CPP elements of the current US standard (*FAS33,* 1979). These publications also influenced the author[7] of the pioneering British study (*Accounting for Stewardship in a Period of Inflation,* ICAEW, 1968), which became the model for the British CPP provisional standard (*PSSAP7,* 1974).

Thus, largely through the medium of Sweeney's work, the European contribution to inflation accounting of the 1920's has influenced American and British accounting standards during the past fifteen years. This suggests that the leading European writers of the 1920's deserve more attention than they are usually accorded in the literature of the subject. We cannot remedy this in the present brief paper, but it may be worth considering some brief details of the work of three leading writers, Schmalenbach, Schmidt and Limperg. This will serve to indicate, albeit superficially, the richness of their ideas and their relevance to the continuing debate on inflation accounting. It will also point to some distinctive aspects of the continental European approach to the subject.

[7] The author was the late Sir Edmund Parker who, in an interview with the present author, acknowledged the influence of Mason's pamphlet and *ARS6.*

(i) EUGEN SCHMALENBACH (1873–1955)

Schmalenbach is, of the three chosen writers, the best documented in the English language, his "Dynamic Accounting" having been translated into English (Murphy and Most, 1959) and his life and work having been reviewed in a book by David Forrester (1977). Like Schmidt and Limperg, Schmalenbach was a business economist, interested in management accounting at least as much as financial accounting, and viewing accounting systems as providing information for decision making and performance evaluation.

Schmalenbach's method was inductive and eclectic. He preferred to rationalise and improve existing practice rather than building abstract deductive systems. Financial accounts in his time[8] did not include profit and loss accounts, the central financial statement being the balance sheet. Schmalenbach proposed the dynamic approach to the balance sheet, concentrating on the flows of funds which give rise to the changes in the balance sheet during an accounting period. He felt that the balance sheet should be prepared with the object of providing an accurate picture of these flows, rather than of providing a static snapshot of the value of the business. In his view, the accruals-based historical cost system did provide an appropriate basis for measuring such flows in a continuing business. He defended the realisation basis and the matching concept; the latter in a characteristically pragmatic and witty defence of depreciation allocations:

> "The dynamist asks whether the addition is to be booked as expenditure in the years of purchase or manufacture, or requires division into expenditure applicable to several years, and he has in mind not only the year in which the addition is made, but also the years to come. He treats these years as his children, not wishing to favour one to the disadvantage of another."

Schmalenbach's aim, of providing some measure of sustainable funds flow, sounds similar to that of some contemporary advocates of current cost accounting, but his means of achieving this aim was traditional historical cost accounting. In periods of inflation, he advocated stabilisation using general price indices, so that he was one of the precursors of historical cost based CPP accounting, although, in later years, his expressed preference was, like that of most of his fellow countrymen, that inflation should be avoided at all costs, thus obviating the need for inflation accounting. It should, however, be noted that, for management accounting purposes, Schmalenbach did advocate the use of market prices prevailing at the time when assets were used, rather than historical costs, and this had a significant impact on practice in Germany (Schoenfeld, 1979).

[8] Or, at least, in 1919, when he first wrote *Dynamic Accounting*.

(ii) FRITZ SCHMIDT (1882–1950)

Schmidt's approach was much more deductive than that of Schmalenbach. He drew his theoretical basis from economics and his central concern was with pricing policy. He was a pioneer of the idea that the misleading information conveyed in historical cost accounts serves to exaggerate the trade cycle (Schmidt, 1927), and he claimed that this problem would be overcome by charging current cost, at the time of sale, against revenue, in calculating profit. He therefore advocated replacement cost accounting as a basis both for pricing policy and for financial reporting and his measure of profit was similar to the operating profit measure advocated by Edwards and Bell (1961) and the Sandilands Committee (1975). He believed in crediting replacement cost revaluations to reserves in the balance sheet, rather than to the profit and loss account, because he had a strongly entity-oriented concept of capital maintenance. He believed that it was necessary to preserve the operating capacity of the business, his reasoning having much in common with national income accountants (who deduct capital consumption and stock appreciation from Gross National Product, on a replacement cost basis) and with Mathews and Grant (1958) the later Australian pioneers of replacement cost accounting.

Schmidt's major work, *Die Organische Bilanz in Rahmen der Wirtschaft* (1921 and later editions) was not translated into English (although a Japanese edition was published) and his only work published in English was a series of three papers published in the USA (two of which are reprinted in Zeff, 1976). This probably explains his neglect by English-speaking authors, which may be remedied by Mattessich's forthcoming study of his work. He certainly deserves credit for having laid the foundations of the replacement cost or current cost accounting systems now in operation. It should particularly be noted that he did not have a naive reproduction concept of replacement: he was concerned with the maintenance of operating capacity by replacement of the service, rather than the specific asset, when technical or economic change rendered the latter obsolete.

One other interesting feature of Schmidt's work is that he pioneered the idea of a gearing adjustment. This appears in one of his papers published in English (Schmidt, 1930), although he confined the adjustment to loan-financed "speculative assets", i.e. those not held for permanent use within the business. Schmidt's ideas, including the gearing adjustment, found expression long after his death in the IdW proposal of 1975 (Coenenberg and Macharzina, 1976).

(iii) THEODORE LIMPERG (1879–1961)

Limperg founded the Dutch school of replacement cost accounting, associated with the University of Amsterdam. Like Schmalenbach and Schmidt, he was a business economist, with a strong interest in the use of accounting information for decision-making and control. Like Schmidt, he drew on economic theory and deductive reasoning for justification of his system, but whereas Schmidt was particularly concerned with the macro-economic implications of his system, particularly for pricing policy and its effects on the trade cycle, Limperg drew on the micro-economic theory of value.

The relationship between Schmidt and Limperg is an interesting one. Their two systems of financial accounting were very similar: both advocated replacement cost valuation, with an entity orientation in the capital maintenance concept, so that holding gains were credited to reserves rather than to profit. Both were therefore concerned with

specific price changes rather than changes in the general price level. Moreover, both emphasised the importance of replacement cost for management decisions. It is clear that Schmidt was the first to publish these ideas: his most celebrated book appeared in 1921, whereas Limperg did not become a full-time academic until 1922 and did not publish a major work in his lifetime, his main means of spreading his ideas being his lectures, which were published posthumously in 1964 (in seven volumes). No significant work by Limperg has been translated into English, so that the English-speaking world has had to rely on Limperg's followers for an account of his ideas. However, a limited study of Limperg's lectures[9] shows that he went to great, and perhaps extreme, lengths to differentiate his work from that of Schmidt, possibly because he knew that Schmidt was first in the field.

There was, however, a clear difference of theoretical approach, Limperg emphasising replacement *value* rather than the replacement *cost* advocated by Schmidt. Limperg's concept of replacement value was very close to the "value to the firm" concept which is the basis of the current cost accounting standards currently in force in both the UK and the USA.

> "The value of a commodity is its realizable value or its replacement value, but always the lower of the two. As to the realizable value a distinction should be made with regard to factors of production between the direct and the indirect realizable value; of these the higher is always relevant." (Limperg, quoted by Burgert, 1972).

"Direct" realisable value is that obtainable by direct sales, whereas "indirect" realisable value is that obtained by using the asset within the firm.

Limperg claimed that this value concept was rooted in the economic theory of value, and he contrasted it favourably with Schmidt's replacement cost concept, which he considered to be mechanical and lacking theoretical underpinning. This controversy is worthy of extensive exploration and is highly pertinent to the present-day debate on current cost accounting. In the context of the present paper, we can make only three observations. Firstly, Limperg greatly over-rated the extent to which his "replacement value" concept was validated by economic theory: the basis of much of his argument was a rejection of marginal utility theory and a return to the cost-based value theory of Adam Smith, rather than an application of modern micro-economic theory.[10] Secondly, Limperg

[9] I am grateful to my former colleague, Professor Willem Buiter, for translating parts of Limperg's work for me, and to Dr H.Kruizenga of Philips for lending me his own copy of Limperg's collected papers and pointing out key passages. A bibliography of Limperg's works is provided by Van Sloten (1981), Appendix 2.

[10] Burgert (1972) elaborates on some aspects on this argument. It is of interest to speculate how much economics Limperg had actually studied. He did not have a university education and spent his early years in accounting practice: his reading of economics may therefore have been highly selective.

However, although Limperg may not have given due credit to Schmidt, we must not be equally ungenerous to Limperg. He had two outstanding successes.

Firstly, during the first part of his career, Limperg built up his own successful audit practice and played a large part in establishing the high standing of the independent auditing profession in the Netherlands. This, in turn, made possible the permissive tradition in the selection of accounting practice (authority being derived not from underrated Schmidt's concept of replacement cost. Schmidt was clearly concerned with cost of replacement of the economic service rather than with cost of reproduction of the physical asset. Thirdly, the practical application of replacement cost accounting in the Netherlands has been as consistent with Schmidt's proposals as with Limperg's: some of Limperg's refinements have proved to be too subjective for practical application (Burgert, 1972). statutory rules but from the status of the auditor) which enabled replacement cost accounting to emerge as a reporting practice by a minority of Dutch companies in the 1950's and 1960's. The Dutch example provided a practical demonstration that forms of current cost accounting were not merely an abstract academic concept.

Secondly, during the second part of his career, as a teacher and researcher, Limperg changed the whole method of thinking about accounting in the Netherlands. His use of economic theory raised the level of discussion from the practical to the theoretical, and he produced successive generations of leading accountants who had been trained to regard accounting as something to be thought about as well as something to be done. This contributed to the Dutch replacement cost accounting experiment, described above, but it also raised the level of the debate in a much wider context, since Dutch accountants and Dutch-based international companies have world-wide connections.

Both of these achievements will reappear in the next section of this paper. For the moment, we must conclude that Limperg's great achievements are undeniable but that, even so, they may have been exaggerated by his more enthusiastic disciples, and we should not accept that he produced irrefutable theoretical arguments in favour of his "replacement value" system.

In conclusion, our brief study of Schmalenbach, Schmidt and Limperg suggests two common features of continental European thought which are worth noting. These are:

(i) A concern with management accounting. Limperg and Schmidt both believed that the same values which were relevant for management decisions were relevant for financial reporting. Schmalenbach, on the other hand, believed that the two sets of information should differ in some respects, different information being required for different purposes. However, he believed that the accounting system should provide a common data base from which all these types of information could be derived.

(ii) A concern with decision-making and economic values. All three writers were concerned to establish forms of accounting which were useful in making economic decisions, and so all three were led to make use of economic theory. They did this in different ways, Limperg emphasising the theory of value, and Schmidt emphasising the macro-economics of the trade cycle. Schmalenbach was less overt in his use of economics, but his dynamic accounting system was clearly designed to meet the needs of those wishing to arrive at an economic valuation of the firm within a framework similar to that of the distinguished economist, Irving Fisher (Fisher, 1906), i.e. by discounting future cash flows. Schmalenbach's rejection of valuing the firm by

summing values in a static balance sheet (the "dualist" view) was based upon his view that the value of the continuing firm as a whole (as opposed to individual assets) could be assessed only by estimating the future cash flows which it would generate. Thus, these leading European authors all, in their distinctive ways, contributed to business economics, by relating economic theory to accounting information.

4. Developments since 1945

In the post-war period, as we saw in section 2, continental Europe has not been in the forefront of inflation accounting practice, as it was in the inter-war period, and the same has been true of the theory of inflation accounting. This has been due in part to the earlier experience: certainly in Germany, the inflationary experience of the early 1920's has left a strong feeling that the best way to deal with inflation accounting is to keep the rate of inflation low. However, there have been important developments in continental Europe and these have had some effect on the development of current cost accounting in the English-speaking world.

The outstanding European contribution of this period was undoubtedly the development of replacement cost accounting practice in the Netherlands. Limperg's impact on Dutch practice was inevitably an evolutionary process, developing as his pupils spread his ideas and achieved positions of importance. The Philips company adopted his principles for cost accounting purposes in 1936, but it was not until 1952 that they adopted his replacement value methods for financial reporting (Van Sloten, 1981). It was a pupil of Limperg, Goudeket, who was largely responsible for this, and who wrote a persuasive article in English describing the Philips system (Goudeket, 1960). Other Dutch companies followed Philips (although, as we have already seen, practice varied and replacement cost was by no means typical) and several Dutch writers spread Limperg's ideas to the English-speaking world (e.g. Goudeket, 1952, Kleerekoper, 1962, and Mey, 1966). Some English-speaking writers also popularised Dutch ideas (e.g. Gynther, 1966, and Holmes, 1972, who both rely heavily on Goudeket, 1960, and Backer, 1973, whose report commissioned by the Financial Executives Research Foundation may have had an important influence on the development of thought in the US A).

It is difficult to assess with accuracy the extent of the influence of the Dutch example. It is certainly the case that Dutch replacement value ideas were spread in both the UK and the USA, and it is also true that standard-setters in both countries were aware that certain leading Dutch companies had implemented forms of replacement cost accounting, thus demonstrating the practical feasibility of such systems. It is also the case that members of the Sandilands Committee visited the Netherlands and were impressed by the Dutch example.[11] Also, in the USA, the Chief Accountant of the Securities and Exchange

[11] It may even be that they were over-impressed. The more popular English literature describing Dutch replacement cost accounting tends to describe how the system works and to skate thinly over theoretical issues, appealing to the authority of Limperg without exposing his ideas to critical examination.

Commission (SEC) quoted the example of Philips in an article supporting replacement cost disclosure which was subsequently required by the SEC (Burton, 1975). However, it is also true that the UK and the USA had produced replacement cost ideas of their own (such as those of Paton, 1918, in the USA) independently of external influences.

Despite the lack of implementation of any form of inflation accounting in Germany during this period, German views and experience probably had some influence on the course of events in the United Kingdom. This probably took two forms. Firstly, the German aversion to CPP accounting, as being associated with the acceptance of inflation as a permanent feature of the economy, seems likely to have reinforced such anxieties in Britain. In particular, the author was told by Sir Francis Sandilands that the German attitude to CPP had influenced his own views on the subject at the time when the Sandilands Committee was in existence. Secondly, the German current cost recommendation (IdW, 1975), although it was not followed in Germany, probably had an influence on subsequent developments in the United Kingdom. Its simple, supplementary, three-adjusiment format was very similar to that of the Hyde Guidelines (1977), and, like the Hyde Guidelines, it included a gearing adjustment applied only to realised gains (the depreciation and cost of sales adjustments), although it calculated gearing on a different basis to that used by the Hyde proposals. The IdW recommendation was certainly discussed by the Inflation Accounting Steering Group, and the endorsement of the gearing adjustment by a respected professional body must have added to its acceptability in Britain, although there was a separate, and apparently independent, British development of the gearing concept (Godley and Cripps, 1975).[12]

Apart from these direct influences from Germany and the Netherlands, the main continental European contribution to inflation accounting during this period seems to have been the gradual dissemination of the theoretical ideas of the inter-war years, mainly through the medium of Sweeney's book (1936). Direct references to continental European writer are rare in the Anglo-Saxon literature of this period, e.g. there are none at all in Lacey's (1952) British treatise on replacement cost, despite its close relationship to the much earlier work of Schmidt (emphasising particularly the trade-cycle consequences of accounting), or in Mathews and Grant's (1958) pioneering Australian work. Edwards and Bell's (1961) American classic does make explicit reference to earlier European authors, but it is not clear that these authors had much direct influence on Edwards and Bell's thinking,[13] although their indirect influence may have been much greater.[14] However, the impact of Sweeney (and implicitly of the continental European writers whose work he digested) was much greater. He is referred to in most of the

[12]Clarke (1982) questions the independence of the British development of the gearing adjustment. It is certainly possible that German ideas influenced the broad intellectual climate which gave rise to the proposal of the gearing adjustment in Britain, but the present author was assured by Wynne Godley that the authors of the Godley/Cripps paper (1975) had no *direct* knowledge of the German gearing ideas at the time when they wrote their paper, and it is quite clear that the Godley/Cripps paper was a logical outcome of the earlier British debate (Kennedy, 1978).

[13]Mattessich (1980) alleges that Edwards and Bell's one significant direct reference to Schmidt (in a footnote) is based upon a misunderstanding.

[14]Mattessich (1980) compares Schmidt's system with that of Edwards and Bell and claims that the Operating Profit measures in the two systems are virtually identical.

leading works published in English during the period, particularly those relating to CPP. Sweeney's contribution to replacement cost and "real terms" accounting seems, relatively, to have been neglected (Clarke, 1976). It was the adoption of Sweeney's system by the Research Division of the AICPA in their research study *ARS6* (1963) which led to the European experience of the 1920's having an effect on standard-setting in the English-speaking world. However, the crop of CPP exposure drafts and recommendations which followed the *ARS6* model throughout the English-speaking world (the USA, UK, Australia, Canada, New Zealand and South Africa) between 1969 and 1975 proved to be abortive. Ultimately, CPP was to become a practical reality not in the English-speaking world but in Latin America, in a group of countries whose inflation rates were high enough to demand immediate action and to make the selection of a particular index less important than the application of any index which would capture, broadly, the decline in the purchasing power of the currency.

Latin America is currently, as was Germany in the early 1920's, a world leader both in inflation and in inflation accounting. The countries to which this applies particularly are Brazil (which has used a form of CPP since 1964), Chile (which introduced a form of CPP in 1974) and Argentina (which, after long debate, finally introduced CPP in 1979). Other Latin American countries are still in a stage of making piecemeal restatements of asset values and (less often) stocks to allow for inflation, and yet others have so far avoided making any adjustment. The piece-meal adjustment approach was previously used in those countries which now have more comprehensive CPP systems, and it resembles the method used in France until 1962. Its motivation is also the same as that in France: for an expense (including depreciation) to be allowed for tax purposes, it must appear in the published financial accounts.

Although Latin America practice varies, a common ideal model of CPP accounting, agreed by the Inter-American Accounting Conference in 1970, has been influential in determining the pattern of reform. This was explicitly derived from *ARS6,* and therefore from Sweeney, and, through him, from the earlier European contribution.

5. Some conclusions

The objectives of the previous section was to show some ways in which continental Europe has contributed to inflation accounting ideas and practice elsewhere. It was not intended to suggest that continental Europe has anything approaching a monopoly of the inflation accounting debate during the period: a great number of writers in the English-speaking world, notably in Australasia, Britain and North America, have made important contributions to inflation accounting, and professional standard-setting bodies and government enquiries in these countries have pursued a programme of theoretical debate and practical experiment much more vigorous than anything done by the counterparts in continental Europe during the past thirty years.

In Britain, for example, replacement cost proposals were made as early as 1952 by the Institute of Cost and Works Accountants (ICWA, now ICMA) and the Association of Certified and Corporate Accountants. CPP proposals were first made by a committee of the Institute of Chartered Accountants in England and Wales in 1968, and the first CPP exposure draft *(ED8)* appeared in 1972, followed by a provisional standard *(PSSAP7)* in

1974, a government report (the Sandilands Report) advocating CCA in 1975, a CCA exposure draft *(ED18)* in 1976, a CCA recommendation (the *Hyde Guidelines*) in 1977 another CCA exposure draft *(ED24)* in 1979, and a full CCA standard *(SSAP16)* in 1980. British theorists also made a distinctive contribution. Even before the Second World War, R.S.Edwards (1938) produced a far-sighted critique of income measurement, dealing with current values and inflation adjustments. Post-war writers, who were, like Edwards, associated with the London School of Economics, include Norris (1945), Lacey (1952), Baxter (1975), Solomons (1966), and Edey (1979). The latter trio were notable for their advocacy of value to the firm. A separate group of important British writers are those associated with the gearing adjustment (notably Godley and Cripps, Kennedy, and Gibbs), who developed the concept in a distinctive manner, and persuaded practitioners to adopt it, albeit in a restrictive form (confining it to realised gains).

However, it is hoped that it has been established that the European contribution has been significant. Three broad conclusions can be derived from the discussion of that contribution:

(1) The European writers on inflation accounting have been insufficiently studied in the English-speaking world. Their ideas have filtered through to the Anglo-Saxon debate, but they have probably been imperfectly understood. Since Sweeney, no leading Anglo-Saxon writer on inflation accounting has made a comparably serious study of continental European theory and practice. Thus, for example, Dutch replacement cost accounting has, at times, received favourable attention on the basis of brief second-hand accounts by Limperg's disciples, rather than serious study of Limperg's original work. This is unfortunate for two reasons. Firstly, it can lead to ideas being imperfectly communicated. Secondly, it can lead to lack of understanding of the assumptions, limitations and context of ideas.

(2) There is an enormous variety of attitudes to and practice of inflation accounting emanating from different countries. Comparative studies of the history and institutional environments, as well as inflation accounting practices, in these countries should provide important insights into the forces which shape ideas and practice in accounting. One example of this is that German and (historically) Dutch writers have tended to adopt an "entity" view of the firm, whereas the tradition in the United States has been of a "proprietary" nature, with the United Kingdom starting with the latter and more recently (in the CCA period) changing to the former view. The reason for these differing views presumably lies in the nature of the capital market, the ownership and control of firms, and the wider economic and political environments of these countries.

(3) International diversity and its causes also require study in the context of harmonisation of accounting standards. The EEC harmonisation policy means that Britain and continental Europe must bring their accounting practices closer together, and there are wider pressures for international standardisation, particularly arising from the growth of trans-national businesses, and expressed in the efforts of the International Accounting Standards Committee. If these efforts at standardisation are to be carried through successfully and with beneficial, rather than harmful, consequences, the reasons for the present diversity of practice must be understood and, where necessary, accommodated. For example, in the context of inflation accounting, it is clear that resort to a CPP solution in practice has been associated with extremely

high rates of inflation, as in certain Latin American countries in recent years and certain continental European countries during the early 1920's.

Thus, the exchange of ideas and information made possible by organisations like the European Accounting Association is not merely a pleasant academic activity (although one hopes that it is that also) but an essential requirement for the understanding of the development of accounting within individual countries and for the successful harmonisation of practice between them.

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8
THE END OF THE CURRENT COST REVOLUTION

*David Tweedie and Geoffrey Whittington**

INTRODUCTION

In 1984, we published *The Debate on Inflation Accounting*, which attempted to provide a comprehensive international and historical survey of the development of the theory and practice of accounting for changing prices. It is important to note that the topic is actually *changing prices* rather than simply *inflation*. The former allows for changes in the *relative* prices of particular assets and liabilities as well as changes in prices due to pure inflation, i.e. to the decline of the general purchasing power of money. In accounting terms, this distinction is reflected in the difference between CPP (Constant Purchasing Power), which adjusts historical cost for pure inflation, and CCA (Current Cost Accounting), which replaces historical costs by the current costs of particular assets, and is therefore concerned with specific price changes.

Our 1984 work found that, in the English-speaking world, the initial reaction of accountants (particularly professional bodies and standard setters) to the rising inflation rates of the late 1960s and early 1970s was to embrace pure inflation accounting systems of the CPP variety. Later, as inflation continued and the debate on price change accounting was protracted by the intervention of governments, there took place what we characterised as the Current Cost Revolution (Tweedie and Whittington 1984: ch. 11), in which CCA became the price change accounting system favoured by standard setters. By 1980, both the USA and the UK had adopted accounting standards which required supplementary disclosure of CCA information by leading companies, under SFAS 33 (of 1979) and SSAP 16 (of 1980) respectively. Similar proposals followed in Australia, New Zealand and Canada, and the Current Cost Revolution seemed to be complete. By 1987, both SFAS 33 and SSAP 16 had been withdrawn, and CCA disclosures were not majority practice anywhere in the world. The purpose of this paper is to trace this remarkable decline, concentrating on the UK and the USA, which led international practice in the field and provided the main focus of our earlier study, but also commenting upon the distinctive experience of other countries during the same period. Notable among these are the Netherlands, in which substantial minority practice of replacement value accounting (which can be regarded as a variant of CCA) had developed long before the Current Cost Revolution occurred elsewhere, and several countries of Latin America, where CPP was adopted as a response to the pressures of hyperinflation, and which did not experience a subsequent switch to CCA.

BACKGROUND

Our book adopted an inductive approach: the historical experience was described and a subsequent attempt was made to derive general propositions about the factors which determined the evolution of accounting standards and practice in relation to changing prices. In this paper, therefore, we have the comparative luxury of being able to start with general propositions about the main causal factors, derived from our previous work (Tweedie and Whittington 1984: ch. 13). This listed five main factors:

1 Economic events (notably inflation rates).
2 Self-interest (such as how certain groups might be affected by the tax consequences of a particular form of price change accounting).
3 Ideas (including not merely the supply of new theoretical insights, but also their dissemination amongst standard setters and practitioners).
4 International influences (the development of practice in any particular country will tend to be informed or influenced by developments in others, particularly if there are close economic ties between countries).
5 Accidents of history (there are historical factors additional to those described above, which will influence developments in a particular country, such as the influence of individuals, committees or reports that are especially persuasive).

All of the above factors will be seen at work in our account of the decline of CCA in the 1980s. In the UK and the USA, which were leaders both in the introduction of current cost and in its subsequent withdrawal, the first two factors were particularly important. In both countries, inflation rates were high in 1979–80, when the two new price change accounting standards were introduced, but there was -subsequently a sharp reduction in the inflation rate. Moreover, in both countries the decline in the inflation rate was a consequence of changes of government economic policy, associated with Prime Minister Thatcher in the UK and President Reagan in the USA. These new political regimes were also in favour of regulation by the market rather than regulation by government, and this took away some of the self-interest incentives for the adoption of price change accounting: not only was the impact of price changes reduced (as a consequence of lower inflation rates) but the possibility of price controls and penal taxation (the impact of

Table 8.1 Inflation rates in various countries

	1973–9 (average)	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*
USA	8.5	13.5	10.3	6.1	3.2	4.3	35	1.9
UK	15.6	18.0	11.9	8.6	4.6	5.0	6.1	3.4
Australia	12.1	10.2	9.7	11.1	10.1	3.9	6.8	9.1
New Zealand	13.8	17.2	15.4	16.2	7.3	6.2	15.4	13.2
Canada	9.2	10.2	12.4	10.8	5.8	4.3	4.0	4.2
Netherlands	7.2	6.5	6.7	5.9	2.7	3.3	2.3	0.1

Source: OECD (1992) *Historical Statistics*, OECD Economic Outlook, Paris, Table 8.11.
Note: The numbers are year-to-year percentage changes in consumer price indices

which might be minimised by the use of price change accounting) was also much reduced. Thus, in retrospect, SFAS 33 and SSAP 16 were introduced too late: the threats

of inflation, and its adverse consequences for business, were about to recede. Table 8.1 provides background data on inflation rates during this period.

We now turn to the experience of individual countries in attempting to implement various forms of CCA. Following the pattern of our 1984 book, we give primacy to the experience of the UK and the USA, which tended to lead international developments during this period. We shall then review the experience of the other English-speaking countries which attempted, with much less success in terms of compliance, to follow the implementation of CCA, and we shall also consider the continuing Dutch experience of replacement value accounting, and the Latin American application of CPP accounting in conditions of extreme inflation.

THE UK EXPERIENCE SINCE 1980

SSAP 16, issued in March 1980, was the result of many years of debate and fourteen years of hard work by the Accounting Standards Committees (ASC's) Inflation Accounting Steering Group (IASG), chaired by Sir Douglas Morpeth. The evolution of the new standard, and its predecessor, the Hyde Guidelines (a voluntary recommendation which proposed some similar disclosures), was described in Tweedie and Whittington (1984: chs 4 to 6). Inevitably, the result of such a long debate was an accounting standard marked by compromise. There were three important compromises in SSAP 16, each of which was to continue to be subject to controversy. First, although SSAP 16 required current cost disclosures based on specific price changes, a compromise with inflation (as opposed to price change) accounting was made in the gearing adjustment and the monetary working capital adjustment, which attempted to reflect the inflationary gain on borrowing and loss on holding monetary assets (albeit using specific rather than general indices). Second, the standard applied only to large companies, not to all companies. Third, current cost adjustments were not required to be made in the main accounts, although this was an option.

Despite its painful birth and the marks of compromise, SSAP 16 was at first a success, in so far as it achieved very high compliance rates. In 1981, the first year in which it was mandatory for all accounting dates, 95 per cent of the companies surveyed in *Financial Reporting* produced current cost data (see Table 8.2). However, three years later this had fallen to 34 per cent, and by 1985 it was only 6 per cent, and SSAP 16 ceased to be a mandatory standard.

The salient facts of this decline are recorded in Table 8.2, which is taken from Pong and Whittington (1996), a paper which examines the events of the period in some

Table 8.2 UK inflation rates, compliance rates, and price-level events, 1977–88

Year	*% increase in average RPI3*	*% of companies producing price-level statements*[1,2,3]	*Price-level accounting events of the year*
1977	12.1	45	Hyde Guidelines
1978	8.4	56	
1979	17.2	58	ED 24 (April)
1980	15.1	78	SSAP 16 (March)

1981	12.1	95	
1982	5.4	81	Green Paper on Corporation Tax (March) Keymer Haslem resolution (July) Stock Exchange stops requiring CCA interim accounts (December)
1983	5.3	61	Neville Reports (April and September) Carsberg Report (November)
1984	4.6	34	ED 35 (July)
1985	5.7	6	SSAP 16 no longer mandatory (June)
1986	3.7	3	Handbook (October)
1987	3.7	3	
1988	6.8	—	SSAP 16 withdrawn (April)

Notes:

1 Based on accounts circulated to shareholders during the year to 30 June of the following year. Hence, 1980 is the first year in which SSAP 16 was universally applicable (SSAP 16 applied to accounting periods commencing after March 1980).

2 The first four years include methods other than the ED 24/SSAP 16 system. The methods were nearly all simplified CCA adjustments consistent with the 1977 Hyde Guidelines. The percentages of companies using these methods were 35, 51, 46 and 6 in 1977, 1978, 1979 and 1980 respectively.

3 *Sources:*

(a)% increase in RPI for the year (year to December)—Datastream. This differs from Table 8.1 figures which are based on a comparison of averages for the final quarter of each year.

(b)% of companies producing price-level statements—Skerratt and Tonkin (eds). Annual Surveys of *Financial Reporting* published by the ICAEW, summarised by Hanson (1989; tables 4 and 6).

detail, using data from the ASC's archives. Although most of the interesting developments in the standard setting occurred from 1983 onwards, following the publication of the first Neville Report, it seems likely, in retrospect, that much of the support for SSAP 16 had already eroded. Reference has been made to the change of economic policy following the change of government in 1979. Table 8.2 shows that inflation dropped from 12.1 per cent in 1981 to 5.4 per cent in 1982, as a result of the new governments anti-inflationary fiscal and monetary policies. Thus, price changes were a much less pressing issue than they had been up to 1981. Moreover, the potential advantages of CCA as a means of defence against government interventions were also reduced. The Prices and Incomes Board, together with the associated threat of government-enforced price controls, was abolished, and in 1982 the Green Paper on Corporation Tax made it clear that CCA was unlikely ever to be used as a base for corporation tax, because it was too subjective. Thus, two of the potential practical benefits to business of producing CCA information were removed before 1983. An empirical study by Lemke and Page (1992) suggests that regulatory and tax considerations were important factors in encouraging firms to withdraw support from

SSAP 16. If this was the case, support may have been damaged irreparably even before the ASC's committees started their review of the future of the standard.

There were two other events in 1982 which support this view. First, Messrs Keymer and Haslam, who had earlier been successful in proposing a resolution of members of the Institute of Chartered Accountants in England and Wales (ICAEW) which led to the withdrawal of the first current cost exposure draft (ED 18 of 1976), proposed a similar resolution to ICAEW members (in July 1982) calling for withdrawal of SSAP 16. This time, their resolution was rejected, but by a narrow margin; 48.5 per cent of those voting supported the resolution. This caused much anxiety to the Council of the ICAEW, the biggest of the professional bodies in the Consultative Committee of Accountancy Bodies (CCAB), the parent organisation of the ASC.

Second, in December 1982, the Stock Exchange withdrew the requirement that CCA disclosures should accompany interim statements. This was a clear signal that one of the guardians of the users of accounts did not consider that current cost accounts were important. Moreover, this view was later supported substantially by the results of the ICAEW research study (Carsberg and Page 1984), which found that current cost information was only of secondary importance, relative to historical cost. Similar empirical results were obtained from the studies of the use of the SFAS 33 disclosures in the USA.

Against this background, the ASC took no immediate action. When issuing SSAP 16, it had committed itself to a three-year experimental period in which no revisions would be made but during which the implementation of SSAP 16 would be monitored by its Inflation Accounting Subcommittee (IAS) and its working parties. The first outcome of this process was the publication of the interim report of the Monitoring Working Party in 1983, exactly three years after SSAP 16 had been issued. This report was known as the Neville Report (after the Chairman of the group, Tom Neville) and the final report, published later in the same year, identified widespread discontent with SSAP 16 amongst preparers of accounts, particularly those in small businesses, but little consensus about how it should be replaced. The Report made some recommendations, notably that SSAP 16 should be replaced by a less demanding standard which did not require a current cost balance sheet and allowed choice of method, but which nevertheless applied to all companies. These recommendations had little direct support from the empirical evidence that had been gathered (e.g. small businesses seemed strongly opposed to CCA and might be expected to oppose universality of application).

Later in the same year, 1983, a four-volume collection of academic studies appeared (later published as Carsberg and Page 1984), containing a variety of empirical studies of the application and use of SSAP 16. Benefits to users (e.g. evidence of use by analysts and commentators) were found, but these were generally small, although some of the studies suggested that the costs of implementing SSAP 16 were also small, so that the standard should not necessarily be ruled out on cost-benefit grounds. The first volume consisted of a survey by Bryan Carsberg ('The Carsberg Report'), which summarised the results and made recommendations. In contrast with the Neville Report, the Carsberg Report concluded that CCA had been shown to be worthwhile and that the CCA experiment should therefore continue, albeit in a form modified in the light of the research results. In contrast to Neville, Carsberg proposed that CCA should continue (whereas Neville supported the much greater choice of price change adjustment method)

and that the universality principle espoused by Neville should be rejected in favour of continuing to confine CCA disclosure requirements to large companies, on cost-benefit grounds. He proposed that simplified methods of calculation, such as the use of price indices, should be allowed, on cost-benefit grounds, in cases of difficulty.

The conclusions of the Carsberg Report were controversial. Messrs Archer and Steele, the authors of a substantial survey which comprised the fourth volume of the Carsberg and Page study, felt that proper weight had not been given to their results which, like the Neville Report, showed that there was strong opposition to CCA amongst preparers of accounts. As with the Neville Report, there was an inevitable degree of difficulty in drawing conclusions from diverse and sometimes contradictory evidence. However, in retrospect, it is clear that there was not really strong evidence in support of the usefulness of SSAP 16; the substantial effort to evaluate the effects of SFAS 33 reached much the same conclusion, and the first major conference to evaluate this evidence took place in 1983.

The empirical evidence in both the UK and the USA was essentially indecisive. At best, small benefits from using current cost data could be detected, but this was at an early stage in the experiment, before users and preparers had become fully accustomed to the new systems. Additionally, it could be argued that the possible deficiencies of the systems as implemented (such as the confusion generated in the UK by the gearing and monetary working capital adjustments) prevented the experiment from being a proper test of the general usefulness of current cost disclosures. Furthermore, relatively simple adjustments had probably been made previously by analysts, and in both the USA (under the SEC's 1975 requirements) and in the UK (under the 1977 Hyde Guidelines) current cost data were published before the full standards were promulgated, so that the market had probably already absorbed much of the initial impact of CCA disclosures.

It now fell to the IAS and the ASC to fulfil the ASC's original (1980) promise that SSAP 16 would be reviewed after the three-year experimental period. There was considerable debate between supporters of what might be loosely characterised as the Neville view (universality of application but freedom of choice as to method) and the Carsberg view (current cost methods required but with application restricted to large companies). To aid the debate, the ASC took two legal opinions (Hoffman and Arden 1983 and 1984) which suggested first that it would be appropriate for the ASC to require current cost disclosures as part of the 'true and fair view' requirement for the main accounts, and second that the true and fair view could incorporate a cost-benefit test, i.e. small companies could be excluded from a requirement on the ground that its cost was high in relation to its benefit to them.

Armed with the Hoffman and Arden opinions, the ASC produced ED 35 in July 1984. This came down broadly in favour of the Carsberg view. CCA would continue to be required, but by way of notes to the main accounts (which would be audited) rather than, as previously, in supplementary unaudited statements. Application would be to public companies only, on the ground that these were the most likely to offer the greater benefits (owing to their wider range of potential users of accounts), and Value based' companies (such as investment trusts and property companies) were to be exempt. Alternative methods of calculating the gearing adjustment were to be allowed (including general indexation) and the methods of assessing the current costs of assets were simplified,

allowing greater use of price indices and putting less emphasis on the need to estimate recoverable amounts.

The responses to ED 35 were overwhelmingly negative: three-quarters of the 119 respondents were opposed to its being developed as a standard (Pong and Whittington 1996). Not only were companies strongly opposed, as might have been expected in the light of the Neville Report and the study by Archer and Steele, but so were audit firms and the CCAB professional accounting bodies which issued the standards prepared by the ASC. The only significant message of support came from the Society of Investment Analysts; other users of accounts remained substantially silent on the issue.

Following the analysis of these responses, early in 1985, the Department of Trade and Industry was approached about possible government backing for a CCA standard, but no offer of support was forthcoming. The Stock Exchange was also unenthusiastic about supporting CCA. Thus, in March 1985, ED 35 was abandoned. Then, in June 1985, the mandatory status of SSAP 16 was removed, so that it became merely a recommendation. This effectively marked the end of the CCA experiment in accounting standards in the UK.

Remarkably, the ASC continued its attempt to develop some sort of standard on accounting for changing prices. It drafted an abortive exposure draft, ED 38, which was never formally issued. This was to apply only to listed companies and required a simple one-line adjustment to profit to reflect changing prices, on a basis to be chosen by the preparer of the accounts. Even this very weak proposal was not supported by the Stock Exchange or government bodies. Thus, in December 1985, the ASC recommended the withdrawal of SSAP 16. In 1986 the ASC published a *Handbook on Accounting for the Effects of Changing Prices*, which merely summarised the alternative methods that had been developed in the debate, as a guide to those who might wish voluntarily to report the effects of price changes (see later). SSAP 16 was now redundant, but it was not formally withdrawn until April 1988, owing to the insistence of one CCAB body (the Chartered Association of Certified Accountants) that the ASC should have some formal recommendation on price change accounting.

The collapse of SSAP 16 and the inability to replace it meant that the ASC's longest-running, most controversial and most time-consuming project had failed, owing to opposition and non-compliance by preparers of accounts. This blow to the authority of the ASC proved to be fatal. When faced with the problems of creative accounting, which flourished in the middle and late 1980s (Griffiths 1986), the ASC could not act decisively because of the fear that its constituency would fail to support it. In 1987, the CCAB appointed the Dearing Committee to investigate the accounting standard-setting process and as a result of its report (Dearing Report 1988), the ASC was replaced by a new body, the Accounting Standards Board (ASB), which had greater independence from the accounting profession, greater resources and some support from company law.

Although 1985 effectively saw the end of CCA as part of UK accounting standards, it did not see the end of CCA in practice. CCA or similar systems had, for some time, been used by nationalised industries, and this was endorsed by the Byatt Report (1986), a report of a Treasury Committee. In the 1980s and early 1990s, a number of important nationalised undertakings were privatised, and most of these adopted CCA for regulatory purposes. Of the major utilities, British Gas still produces its main accounts on a CCA

basis, which is also used for regulatory purposes. The electricity distribution and water companies also use CCA for regulatory purposes and make the regulatory accounts available to the public, although their main accounts are on the widely used historical cost basis (including some revaluations). The airports company, BAA, follows a similar practice. However, it has to be said that the use of CCA for regulatory purposes has not been without difficulty. In particular, the valuation concepts of recoverable amount and modern equivalent asset give rise to practical difficulties in some cases (Whittington 1994).

Apart from the survival of CCA as a complete system in regulated utilities, piecemeal revaluation on a current value basis has continued to be practised in the UK and, if anything, its popularity has increased, e.g. in the case of marking to market of commodity stocks. Current values have also tended to become more common in the USA, which has traditionally adopted a stricter view that historical cost should be the basis of generally accepted accounting principles. In the UK, the ASB adopted in 1994 the value to the business criterion, which was used as the valuation basis of CCA, as a basis in FRS 7 for measuring fair values in acquisition accounting. However, the partial use of value to the business or other forms of current value in accounts is far removed from the reintroduction of CCA. The latter seems extremely unlikely, despite the apparent belief of some that the reintroduction of CCA is on the ASB's agenda (Paterson 1996). In reality, the ASB has committed itself to evolutionary reform of the status quo, by putting the present system of mixed valuation (historical cost and current value) on to a more consistent basis, and, in its analysis of capital maintenance systems (in its draft *Statement of Principles* of 1995), has not even discussed the gearing adjustment and monetary working capital adjustment, which were integral components of SSAP 16. Thus, 1985 really did see the end of SSAP 16 as an accounting standard for the foreseeable future, and probably for ever, although the pressures to report more up-to-date costs and values remain and will no doubt influence the future development of accounting practice and standards.

We turn now to the experience of the USA, which resembles that of the UK in many respects.

THE US EXPERIENCE

The USA's inflation accounting standard, SFAS 33 'Financial Reporting and Changing Prices' (published in September 1979), preceded the UK's SSAP 16 by six months. Unlike SSAP 16, which required only one form of price-level-adjusted information, SFAS 33 required both current cost and CPP data. As a result of the deliberation of the special industry task groups, companies engaged primarily in the exploitation of natural resources or the ownership of income-producing real estate property were exempt from the current cost requirements of SFAS 33 but were subject to special requirements published in 1980.[1]

The CPP information did not require comprehensive restatement and, in particular, did not require a stabilised balance sheet: a restated income statement was required, with the gain or loss on net monetary assets shown separately. The current cost adjustments were confined to inventory, property, plant and equipment used in the operations of the

business. Income from continuing operations on a current cost basis was required together with the current cost amounts of inventory, property, plant and equipment at the end of the fiscal year, and changes during the year and the current cost amount of these items net of inflation.

The current cost concept was, as in the exposure draft, based upon the replacement cost of the actual assets held and used, modified to the value of the firm by applying what was now called Recoverable amount' when this was less than replacement cost. This definition of current cost caused problems and may have been one of the reasons for the lack of support of the standard by users.[2] A five-year summary of selected financial data was also required.

The standard came into effect for the fiscal years ending on or after 25 December 1979, although the publication of the current cost data could be delayed for one year. It was promised at the time the standard was issued that it would be reviewed within five years of its publication. In preparation for the review, the FASB encouraged a wide range of research studies to learn about the experiences of preparers, users and auditors with both historical cost/CPP information and current cost/CPP information.

The early results were discouraging: for example, studies by Berliner (1983) and Norby (1983) revealed evidence of limited use of SFAS 33 data by analysts. Berliner's survey of 190 analysts revealed that half of the respondents ignored the supplementary price-level information. Only 10 per cent used it frequendy. The main concerns of the analysts were the 'non-comparability' of SFAS 33 information and doubts about the data's relevance and reliability, while a significant number believed the information to be redundant as appropriate data could be obtained elsewhere.

Berliner found that the analysts expressed no great enthusiasm for CPP data, a finding that was also supported by Norby who discovered that current cost data were being employed (if sparingly) in company analysis. Norby gave an indication that approximations of SFAS 33 data could be derived from publicly available sources in that the factors affecting the magnitude of the adjustments were well known, i.e. inventory turnover, inventory method, capital intensity and the age of assets. Once the initial adjustments were reported, the subsequent adjustments were predictable and information about changing prices was readily available throughout the year. Consequently the availability of other information could have limited the direct demand for SFAS 33 data.

In a major report, published by the FASB, Beaver and Landsman (1983) examined the impact of SFAS 33 data on changes in share price. Their findings were dramatic:

1 Once historical cost earnings were known, SFAS 33 earnings variables provided no additional explanatory power with respect to differences across firms in yearly stock price changes.
2 Even after any one of the SFAS 33 earnings variables was known, knowledge of historical cost earnings still provided additional explanatory power. In this sense, historical cost earnings dominated the SFAS 33 earnings variables.

In July 1983, a task force was appointed by the FASB to assist the Board in evaluating whether to continue the SFAS 33 requirements after the initial five-year period and, if so, what changes should be considered. An FASB Invitation to Comment Supplementary disclosures about the effects of changing prices' was published with the assistance of the task force and was designed to supplement the research studies by soliciting the advice of

users, preparers and auditors. Four-hundred responses were received and they confirmed that SFAS 33 information was not widely used. A large number of the responses suggested that the costs of preparing the disclosures had outweighed the benefits, some stating that, although inflation was considered in assessing results of operations, mandatory disclosure requirements were unnecessary because users had developed their own methods for those assessments. Others supported supplementary CPP or current cost information but suggested that the presentation of two methods of accounting for inflation had led to confusion.

The results of the various surveys and the lack of use of constant dollar information led the Board to remove the CPP requirements of SFAS 33, and by SFAS 82 (1984) the requirements for all companies were eliminated.[3]

In December 1984 an exposure draft, 'Financial Reporting and Changing Prices: Current Cost Information', was issued, proposing the combination without significant change of all existing FASB pronouncements relating to reporting supplementary information on the effects of changing prices. A standard based on the exposure draft would have differed from existing requirements in two respects. The five-year summary of selected financial data would have been stated in average-for-the-currentyear units of purchasing power, i.e. the SFAS 33 options to use base year dollars or the end-of-the-current-year consumer price index would have been eliminated. In addition, a gain or loss on disposal or write-down of inventory, property, plant and equipment included in income from continuing operations in the primary statements would have been adjusted to reflect the current cost basis of the item prior to its disposal or writedown when included in income from continuing operations on a current cost basis.

More than a hundred respondents commented on the exposure draft, a large majority recommending that the Board discontinue the existing requirements, arguing that the data did not appear to have been used by the institutional investment community, bankers or investors in general. Several reasons were cited for the lack of interest in the price-level-adjusted data: the lack of relevance or reliability of the data; the difficulty of comparisons caused by the flexibility of the methods of application; doubts about the quality of the information used to prepare the changing prices information; the failure to disclose assumptions; and the cost of preparing the data compared with its benefits.

Many respondents argued that even an improved set of disclosures would not be useful because investors had developed other sources of data on the effect of changing prices. Many also commented on the fall in the inflation rate which led to interest in more important factors than changing prices for investment decisions, namely the ability to raise capital from outside sources to finance replacements of productive capacity and the effects of interest rates on monetary assets and liabilities.

Despite the fact that only a minority of respondents argued that the supplementary disclosures required by SFAS 33 should be continued, the Board considered alternatives suggested by respondents. The Board recognised that reducing the data required could result in substantial cost savings but doubted whether users would gain much from such limited data.

Eventually the FASB decided to continue the requirements of SFAS 33 for a further year throughout 1985, while the Board continued a project to develop more effective and useful disclosures. In particular, the Board developed a comprehensive changing prices model that reflected both current cost and general price-level adjustments of financial

statement items and considered which aspects of such a model were sufficiently relevant and reliable to be included as supplementary disclosures and financial reports.

To tackle this project the Board considered the four factors which determine whether to undertake a major project:

1 *The pervasiveness of the problem.* It was clear that the problems of changing prices were pervasive yet there was little interest shown in SFAS 33 information and enterprises generally provided only the minimum disclosures required.
2 *The potential for developing an alternative solution.* The Board was concerned that many of those who did not accept SFAS 33 disclosures believed that they were not sufficiently relevant or reliable for some or all enterprises and these opponents may not have accepted any eventual technical solution.
3 *The technical feasibility of the problem.* SFAS 33 did not require presentation of a bottom line' alternative to net income. If a project on this issue were to be undertaken, the Board would have had to readdress many complex issues of recognition and measurement which had been considered as part of the conceptual framework but which remained contentious and unresolved.
4 *Practical consequences.* Without a clear indication of alternative accounting solutions, it was difficult for the Board to assess whether others (such as the SEC or Congress) would be inclined to act if the Board did not. Government interest in any requirement to continue the disclosures of SFAS 33 appeared to have diminished.

As a result of these considerations the Board decided not to proceed with the project to develop a comprehensive changing prices model and concluded that supplementary disclosures required by SFAS 33 should not be required. Instead an exposure draft financial Reporting in Changing Prices' was issued in September 1986, proposing voluntary disclosure of supplementary information on the effects of inflation and changes in specific prices.

The exposure draft received 215 responses, 93 per cent supporting the withdrawal of the mandatory nature of SFAS 33. The main arguments in favour of voluntary disclosures were that: supplementary price-level information was not used (mentioned by 47 per cent of respondents); the costs outweighed the benefits (30 per cent); and the information was misleading (12 per cent) or irrelevant (10 per cent). The few opposing the exposure draft and arguing for the retention of SFAS 33 feared that inflation would return and the progress made would be lost. (Inflation had fallen from 13.5 per cent in 1980 to 1.9 per cent in 1986.)

While the Board agreed with many of the concerns expressed by those few respondents supporting continuance of a changing prices requirement, the lack of use of the data and the effort involved in rectifying the deficiencies of the existing disclosure requirements would have been so expensive and time consuming that it was believed that no reasonable cost-benefit relationship could have been attained.

Consequently, in December 1986, the Board withdrew SFAS 33 by issuing SFAS 89 'Financial Reporting and Changing Prices' which encouraged but did not require companies to disclose supplementary information on the effects of changing prices with effect for financial reports issued after 2 December 1986.[4] The decision was not, however, unanimous. Three of the seven members of the Board dissented, believing in the words of one dissenter that:

accounting for the inter-related effects of general and specific price changes is the most critical set of issues that the Board will face this century. It is too important either to be dealt with inconclusively as in the original Statement 33 or to be written off as a lost cause as in this Statement.

Table 8.3 Number of companies producing supplementary information required by SFAS 33

Fiscal year	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*
CPP information	326	450	459	352[a]	291	91[b]	5	0
CCA information	119	406	450	462	462	455	475	98[c]

Source: Accounting Trends and Techniques, AICPA, various years
Note: Number of companies surveyed=600 (industrial and merchandising companies registered with the SEC, a majority of which are traded on the New York Stock Exchange)
[a] Affected by SFAS 70.
[b] Affected by SFAS 82.
[c] Affected by SFAS 89.

The dissenters argued for continuing the experiment to avoid losing systems and data continuity. One of those arguing against the issue of the standard even suggested that an articulating set of adjusted statements should be produced. It was not to be. In effect, the issue of SFAS 89 ended the inflation accounting experiment in the USA. Table 8.3 shows the dramatic change in the use of supplementary price-level-adjusted information between accounting years 1979 and 1986. By 1987 companies were simply including a discussion of inflation in the Managements Discussion and Analysis of Financial Condition and were not displaying supplementary price-level-adjusted information in the financial statements. In the words of one prominent FASB member the issue was ‘dead in the water’.

DEVELOPMENTS IN AUSTRALASIA

Australia

At the time of our earlier study (1984), the Australian professional accounting bodies had just issued a non-mandatory recommendation, Statement of Accounting Practice No. 1 (SAP 1), ‘Current Cost Accounting’, 1983. This recommended a supplementary profit and loss account and balance sheet on a current cost basis, using value to the business as the valuation method and with operating capability, rather than financial capital, as the capital maintenance concept. We observed at that time that the status of SAP 1 as a recommendation rather than a mandatory standard reflected the widespread opposition to price change accounting in Australia, particularly amongst the business community, following the failure of the government to base corporate taxation on a CCA method, as recommended in the Mathews Report (1975).

Subsequent events were no more favourable to the voluntary adoption of CCA, and Jim Paul of the Australian Accounting Research Foundation[5] summarises the response to SAP 1 as follows: 'Not surprisingly, given its non-mandatory status and the "worldwide" decline in interest in accounting for changing prices the application of SAP 1, particularly by companies, has been underwhelming'. Table 8.1 shows lower inflation rates in Australia from 1984 onwards, which must have been relevant. However, as a result of its non-mandatory status and widespread neglect, SAP 1 has not been withdrawn, and thus has survived longer than any other CCA recommendation or standard in the countries which we have studied.

Thus, CCA never took root in Australian private sector financial reporting practice, despite a lively debate on the subject in the 1970s. However, in Australia as in the UK there was subsequent interest in applying CCA to government-owned enterprises. This occurred at the same time as the Byatt Report was under discussion in the UK and it had a similar motivation. The Australian development of CCA in the public sector was led by the state of Victoria, which issued Accounting Policy Statement (APS) 1 'Rate of Return Reporting', in July 1986. This required five major commercial public authorities to produce supplementary balance sheets and profit and loss accounts on a current cost basis, including real holding gains and losses (i.e. gains and losses relative to movements in a general price index) in the measure of profit. The latter distinguished APS 1 from SAP 1 and was necessary because APS 1 was concerned with measuring a real rate of return on assets from the perspective of the provider of finance (the government in this case) rather than the enterprise itself. Thus a financial measure of capital maintenance was preferred to an operating capability measure. A similar approach was adopted, for the same reason, by the UK's Byatt Committee (1986) and it was followed later by the South Australian Treasury in a paper issued in 1989.

In 1990, the Council of Australian Governments set up a Steering Committee for National Performance Monitoring of Government Trading Enterprises, and in 1994 this issued *Guidelines on Accounting Policy for Valuation of Assets of Government Trading Enterprises using Current Valuation Methods*. These guidelines propose the measurement of non-current physical assets on the value to the business basis. They are not binding on state governments, but have in practice been influential in determining the accounting requirements placed by governments on statutory authorities and government departments.

Thus, an element of CCA has developed in practice in the public sector in Australia. In the private sector, on the other hand, the only small residue of CCA practice is in the option to re-value non-current assets and the requirement for downward revaluation to recoverable amount, which is regulated by the accounting standard AASB 1010 (revised, June 1993). This results in a system which is best described as modified historical cost and resembles current practice in the UK.

New Zealand

The New Zealand current cost accounting standard, CCA-1, was issued in 1982. Its salient characteristics, as described in Tweedie and Whittington (1984: Table 10.2) were supplementary disclosure of current cost information (including a balance sheet), with a choice of capital maintenance adjustments (either specific index-based gearing and monetary working capital adjustments or general index-based adjustments). Failure to

comply with the standard would not lead to a formal qualification in the audit report but was required to be reported by the auditor. Thus, the content and status of the standard were broadly consistent with the UK's SSAP 16.

Whereas SSAP 16 in the UK initially achieved a high compliance rate, CCA-1 in New Zealand was an instant failure, in so far as only a small minority of companies complied with it. A survey of compliance in its first year of application, 1983, by Peterson *et al.* (1984) found that, of 147 companies surveyed, only twelve (just over 8 per cent) complied with CCA-1. This poor compliance rate did not improve in subsequent years, and CCA-1 was finally withdrawn in 1985. This effectively marked the end of the CCA experiment in New Zealand, a country which had contributed substantially to the international development of CCA through the work of the Richardson Committee, although voluntary supplementary CCA disclosures were still permitted, and, as in the UK, the current cost valuation basis achieved an after-life in the utility industry (particularly in the 1994 New Zealand electricity legislation). There are thus strong similarities with the experience of CCA in Australia, where CCA was never widely practised in the private sector but did find a role in the public sector.

The reasons for the failure of the New Zealand CCA experiment appear to have been compatible with the factors which led to similar failures in the UK and the USA, although one factor which was present in the UK and the USA, rapidly declining inflation rates, was less important in New Zealand. Table 8.1 shows that inflation rates were substantially lower in 1983 and 1984, the first two years of CCA-1's application, but this was under the influence of a wage and price freeze, which ended in 1984 and was followed by a return of much higher inflation. However, the wage and price freeze itself probably had an important effect on attitudes to CCA-1. The nature of the freeze meant that there was no scope for negotiating higher prices on the basis of CCA costs, and the government was unwilling to give corporation tax concessions on the basis of CCA, because this would upset the delicate balance between the incomes of labour and capital. Baskerville (1994), in a report of interviews with leading participants in the New Zealand standard-setting process, notes the apparent importance of the attitude of the Prime Minister (The Rt Hon. Robert Muldoon, a chartered accountant) in opposing CCA-1 at the time it was issued. Previously, governments had encouraged the development of CCA and the Richardson Report was the result of a government-sponsored inquiry. Thus, there are strong parallels between the roles of governments in the UK and in New Zealand, early support for CCA being followed by a distinct lack of support from the government.

The importance of price controls and of taxation are also common to the UK and the New Zealand experiences. The survey by Peterson *et al.* summarised the reasons for non-compliance given by fifty-three companies which amounted to ninety-four expressed reasons in all (some companies giving multiple reasons). Of these, only twelve explicitly mentioned the lack of use of CCA for tax purposes and only three mentioned lack of use for pricing purposes. However, most of the other reasons given were somewhat bland, which suggests that the reasons stated were intended to show the respondents in a favourable light (and CCA in a bad one): overt public statements of self-interest on issues such as taxation or price policy might be expected to have been avoided by the majority. A study by Wong (1988), of the characteristics of New Zealand companies which presented supplementary CCA statements on a voluntary basis, prior to 1982, suggested that such companies tended to have high effective tax rates and to have characteristics

which would otherwise make them vulnerable to government intervention (e.g. high levels of industry concentration and high rates of return, which might invite attention from the competition authorities) against which CCA might provide some defence (e.g. by lowering apparent rates of return). Thus, Wong concludes that the wish to influence tax policy and avoid other government interventions provided a motive for adopting CCA disclosures. This is also consistent with the opinions expressed in Baskerville's (1994) interview study.

In New Zealand, as in the UK, the failure of the CCA experiment demonstrated the potential weakness of a system of voluntary accounting standards, sponsored by a professional body with only persuasive powers. In 1994 the system was replaced in New Zealand by a new body appointed by the government and having legal backing for its standards.

OTHER COUNTRIES

Canada

As reported in our earlier study, the Canadians also experimented with inflation accounting. A non-mandatory guideline on CPP was published by the Canadian Institute of Chartered Accountants (CICA) in 1974 followed, a year later, by a CPP Exposure Draft. The current cost revolution, however, changed the climate of opinion and, in 1976, a current value discussion paper was issued, to be replaced in 1979 by a CCA Exposure Draft. This publication bore a close resemblance to the UK's ED 24 published earlier the same year, but given the close economic ties with the USA it was not surprising that the CICA reconsidered its position and moved towards the SFAS 33 position, publishing in 1981 a revised exposure draft, followed in October 1982 by an inflation accounting standard (Handbook section 4510 'Reporting the Effects of Changing Prices') in which all the supplementary information required by SFAS 33 was recommended (but not required) to be shown, with the exception of CPP income from continuing operations.

In addition, however, two financing or gearing adjustments were to be shown. The first was calculated by reference to the two current cost adjustments, i.e. depreciation and cost of sales, in a manner similar to that of SSAP 16, and the other, like the New Zealand standard published earlier that year, being based on realisable holding gains of the period, i.e. the changes in the current cost amounts of stock and fixed assets. The Canadian position, therefore, lay between those of the UK and the USA and close to that of New Zealand. As in New Zealand and Australia, Canada's standard was not obligatory, and it was not widely followed in practice.

At the time that Handbook section 4510 was issued, the Accounting Standards Committee indicated that it would undertake a comprehensive review of the recommendations after five years had elapsed. The review would examine the implementation of the standard and the way in which the supplementary information required was being used. A research report was duly published in May 1990 (Hanna *et al.*), and it did not encourage further experimentation. Only a minority of analysts surveyed stated that the required disclosures had been very useful, mainly because of: a low participation rate by companies preventing analysts from making comparisons; lower inflation rates; and concerns about both data reliability and the complexity of the

requirements. Nevertheless, only a small minority of users believed that the section should be withdrawn, although most felt it should be improved. On the other hand, a majority of preparers opposed the section and believed the experiment was a failure, arguing that the disclosures were too subjective and misleading. Not surprisingly, given that preparers bear the costs of preparation of the accounts, only 31 per cent rated the issue of accounting for changing prices as important compared with 70 per cent of analysts.

The reports authors stated that in their opinion the current version of section 4510 should be removed and resources should not be invested to improve it. They believed the experiment failed, partly because of measurement errors, caused largely by inadequate adjustments for technological change, and because disclosure was not mandatory, thereby making comparisons across companies difficult.

The Accounting Standards Board withdrew section 4510 from the CICA Handbook in March 1992 and has not undertaken further work on the topic. This action was not surprising given the fall in the inflation rate from 10.2 per cent in 1982 to 1.5 per cent ten years later, the withdrawal of SFAS 33 over five years earlier by the FASB and in particular the lack of observance of the Canadian standards requirements. A survey of 300 companies, *'Financial Reporting in Canada'*,[6] revealed that the proportion of companies giving supplementary information on the effects of changing prices following section 4510 changed from 14.3 per cent in 1983 to 4.7 per cent in 1986. By 1991 only two companies in the survey gave numerical financial data on the effects of changing prices—by 1994 that number had fallen to one. In 1994, sixteen companies stated that the effect of inflation was not significant during the period (eighteen in 1991) and five made other comments (eighteen in 1991).

South Africa

In South Africa, the National Council of Chartered Accountants (from 1980 the South African Institute of Chartered Accountants) produced a discussion paper in 1975 which concentrated upon a CPP approach but which also addressed the problem of relative price changes and proposed the incorporation of current values into the CPP system. The paper was produced very late in the CPP stage of evolution of price-level accounting, which probably explains the introduction of relative price changes. Given the international move towards current cost accounting commencing in 1975, CPP was not developed further in South Africa. Instead, in August 1978, a guideline proposing CCA adjustments very similar to those of the Hyde Guidelines in the UK was suggested. The non-mandatory guideline was not widely followed—a study by Davison and Westwick (1981) revealed that, in a survey of reports of 528 listed companies, only eleven included supplementary current cost income statements.

Nevertheless, in September 1986, at a time when the American and British standard setters were withdrawing their CCA pronouncements, the Accounting Practices Committee of the South African Institute of Chartered Accountants published Exposure Draft 66 'Disclosure of Current Value Information in Financial Statements' suggesting that financial statements should give information on the impact of changing prices on the results of operations and the financial position of the enterprise, either in the primary statements or in supplementary financial statements. It was further recommended that the

current value of assets and the bases upon which the current values had been estimated should be disclosed.

The exposure draft was not well received being deemed too vague and extremely onerous to small companies. Commentators suggested that the proposed statement should be mandatory for listed companies only.

In the light of this reaction, the Accounting Practices Committee (APC) published a second exposure draft in 1989—ED 77 'Disclosure of Current Value Information in Financial Statements'. Like ED 66, the exposure draft did not supersede the 1978 Accounting Guideline which remained recommended accounting practice. The APC continued to pursue the route taken by ED 66, proposing that information on the impact of changing price levels should be given either as supplementary disclosure or in the primary accounts. The new publication, however, fleshed out the basic requirements of its predecessor by giving more guidance about the appropriate methods of asset and liability valuation and new adjustments to the income statement. The APC's aim appeared to be to produce a comprehensive, effective and low-cost method of accounting for the impact of inflation (which at the time was still in double digits; see Table 8.4).

The major changes from the sparse requirements of ED 66 were new proposals to show the current value of liabilities and fuller details of the effect of price changes on income. In particular, as far as the latter was concerned, it was proposed that the current value income statement should disclose Income or loss from operations, preferably measured after allowing for current cost of sales and depreciation, the recognised holding gains on non-monetary assets and the recognised changes in the value of monetary assets and liabilities'. The total, termed 'comprehensive income', was to be disclosed before a transfer to capital maintenance reserves was determined, based either on the financial capital or on the operating capital maintenance concept, to arrive at current value income.

In general, commentators disagreed with the principles of ED 77. Of fifty-six respondents, only eleven accepted its recommendations outright and, although a further fifteen gave qualified support, thirty rejected the proposals. The main objection related to the subjectivity and impracticability of the proposals, enabling companies to manipulate the results. Others felt the costs of preparing the information were not equalled by the benefits obtained, while some argued that if information were to be presented it should be given in the supplementary financial statements. Given the opposition to ED 77, the APG began to re-examine the subject. Senior members of the Investment Analysts Society were surveyed, the majority of whom stated that if annual financial statements were produced

Table 8.4 South African annual inflation rates

	Average 1977–86	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*
% change in consumer prices	13.9	16.2	12.7	14.7	14.4	15.3	13.9	9.7	9.0

Source: International Monetary Fund (1995) *World Economic Outlook,* October, Table A12 2

on the basis of ED 77 the information presented would be used, particularly if it could be standardised. Encouraged by this reaction the APC submitted a revised proposal to the top thirty companies listed on the Johannesburg Stock Exchange and eight other

companies who had submitted meaningful comments on ED 77, suggesting that any inflationadjusted information could be presented in supplementary financial statements or by way of notes. It was proposed that the income statement adjustments would be in line with the original guideline, similar to the Hyde Guidelines, and that consideration should be given to reflecting the net balance of the current cost adjustments (cost of sales, depreciation and financial gearing) in the primary income statement as a transfer, below the line, to a capital maintenance reserve. Furthermore the current value of non-monetary assets should be shown either by way of a note or in a supplementary balance sheet.

Of thirty companies replying, only 25 per cent stated that they would be willing to comply with the proposals if they became compulsory, those opposing the suggested pronouncement arguing that a standard set of rules would not work in practice given that the performance of companies was now measured by a widespread number of methods in the inflationary environment.[7] The APC ultimately concluded that amending ED 77 or the guideline would be pointless as it was clear that any price-level accounting proposals would not gain general acceptance. Overseas experience reinforced this view.

In the 1992 *Survey of Financial Reporting* (SAICA 1992, the latest survey available at the time of writing) it was revealed that, out of a hundred companies surveyed, only nine provided current cost income statement information and only six a current cost balance sheet, a position that has been virtually unchanged from 1982. While the non-mandatory guidance issued in 1978 has not been officially withdrawn, CCA in South Africa, as in other countries, is very much a minority practice, despite the fact that, as Table 8.4 shows, inflation has continued at a significant rate.

The Netherlands

Tweedie and Whittington (1984) described the important contribution made by the Netherlands to the evolution of a form of CCA, known there as replacement value accounting. Whereas historical cost was majority practice, a significant minority of companies (including the very largest, such as Philips and Shell) produced either partial or complete current cost information either as a substitute for or as a supplement to historical cost. This practice has continued, albeit with changes of fashion. Dutch practice in 1985 was surveyed by Van Offeren (1990) and a survey of practice in 1989 appears in Van Offeren *et al.* (1991). A recent survey by Brink and Langendijk (1995) suggests that the application of current cost increased in the period 1975–86, possibly as a lagged response to the high inflation rates of the period 1971–82. This was followed by a slow decline until 1990 and a more rapid decline after that. However, even in 1994, there was still a substantial amount of current cost disclosure: of 145 listed companies surveyed by Brink and Langendijk, only 37 per cent failed to provide any current cost information.

On the legislative front, the Netherlands incorporated the provisions of the EC Fourth Directive, in a 1983 revision to the Accounting Act, in such a way that Dutch companies were permitted to present accounts either on a historical cost basis or, under the alternative accounting rules, on a current cost basis. This ensured that existing Dutch practice could continue, in conformity with EC requirements.

The theoretical debate in the Netherlands had also continued to be lively during the inflation of the 1970s. Van Offeren (1988) gives an account of this and, in particular, of the discussion of the introduction of inflation adjustments for capital maintenance purposes, including gearing adjustments. In the early 1980s, several Dutch companies

experimented with gearing adjustments. Brink and Langendijk (1995) report that, in 1985, six of the listed companies that they surveyed were using gearing adjustments; all were large international companies and they included Shell, Philips and Unilever. By 1994, their survey showed that the application of the gearing adjustment had disappeared completely, and the need for international comparability of accounts of internationally listed companies was a probable factor in this. Similarly, these international companies reduced or abandoned their current cost disclosures: in 1992 even Philips, the flagship of Dutch replacement value accounting, ceased its practice of basing its main accounts on a comprehensive replacement value system.

Apart from the pressures of the international decline of CCA (particularly in the USA and the UK), which were bound to be important to an economy like that of the Netherlands, with a high level of international trade and some very large international companies, the relative decline of CCA in the Netherlands is attributed by Brink and Langendijk to the lower inflation rates after 1983, which can be seen in Table 8.1. The Dutch experience of inflation in this period was, however, more moderate than that of the USA and the UK, and its replacement value accounting methods had evolved over a longer period. Thus, the Netherlands did not experience a Current cost revolution' in the 1970s, and it did not subsequently experience a dramatic collapse, or 'counter-revolution' in the 1980s. The pattern was more one of increasing interest in replacement values, followed by decreasing interest but not abandonment. The degree of individual discretion allowed to Dutch companies and their auditors has enabled a wide variety of practice in which partial disclosure of current cost information, particularly in relation to fixed assets, is still the predominant practice.

An interesting postscript to the Dutch experience is that in the Nether-lands, as elsewhere, there has been some interest in CCA reporting by public utilities. A survey by Berghouwer *et al.* (1996) revealed that, in the financial year 1994, six of forty-three public utilities investigated were still using the gearing adjustment, although five of these were combining it with historical cost. The reasons for this arose from the regulatory frameworks and financial strategies (target debt/equity ratios) of the companies concerned.

Latin America

At the time of our previous work (1984), a number of countries of Latin America had experienced hyperinflation and had adopted general index adjustments of the constant purchasing power (CPP) variety, rather than CCA. The leading exponent of this method was Brazil, which had adopted this type of system in 1964. Other examples cited were in Argentina, Chile and Uruguay. Accounting of this type has since been recommended by an IASC standard (IAS 29) for use in hyperinflationary economies.

Thus, Latin America is in a sense irrelevant to the story of the decline of CCA, since the system did not take root there, and has not done so since. However, the Latin American experience does serve to illustrate one important feature of the motivation for systems of price-adjusted accounting, whether of the CCA or CPP variety, namely the influence of inflation rates. Brazil, one of the exemplars of CPP, retained this system throughout the 1980s and it was strengthened in 1987 by a stock exchange requirement for listed companies to produce fuller CPP information, consistent with the requirements of IAS 29. However, from 1 January 1996, the allowance of CPP adjustments for tax

purposes (the original motivation) has been withdrawn, as has the requirement for adjustment in the statutory accounts, and the stock exchange requirement has been reduced to the status of an option. This dramatic weakening of the CPP system in Brazil follows a considerable reduction in the rate of inflation associated with currency reforms designed to terminate the process of hyperinflation.[8]

The only Latin American country to experiment with CCA valuation methods has been Mexico where, in 1984, Bulletin B10 of the Mexican Accounting Principles Board required that the effects of inflation be reported in financial statements. General index adjustments were to be applied to equity, but non-monetary items could be adjusted either by reference to a general index or on a current cost basis. Essentially, this gives a choice between a CPP system (general indexation of historical cost for equity and non-monetary assets) and a real terms system (specific price adjustment of non-monetary assets and general price-level adjustment of equity), and is consistent with the international standard (IAS 15). B10 has been widely followed, especially by listed companies, because failure to comply leads to a qualified audit report. However, there has recently been pressure to withdraw the current cost option, led by the Mexican Securities Commission, which believes that some asset values are being overstated, and it is proposed to remove the option in 1997.

The other three Latin American countries which we cited in 1984 as having forms of CPP accounting were Argentina, Chile and Uruguay.

In Argentina, requirements for CPP adjustments have been withdrawn, following a government decree of August 1995. This followed four years of very low inflation (the wholesale price index increased by 3 per cent in 1992, 0.1 per cent in 1993 and 1.6 per cent in both 1994 and 1995). The Argentine professional standard setting body (FACPCE), which devised the CPP system used in Argentina, has responded to the government decree by stating that, when inflation is less than 8 per cent per annum, the absence of inflation adjustment does not constitute a deviation from generally accepted accounting principles.

In Chile, the CPP system that was introduced in 1974 has remained in place, possibly because inflation has remained at double-digit annual levels. In 1994 consumer prices rose by 11.4 per cent, which was the lowest annual rate in the period 1987–94. The average annual rate for 1977–86 was 31.3 per cent. The Chilean method of CPP adjustment does allow for replacement cost restatement of inventory, and thus contains one element of current cost adjustment.

In Uruguay, inflation rates have remained high. Consumer prices rose by 44.7 per cent in 1994, which was the lowest in the period 1987–94. Against this inflationary background, companies have continued to make partial adjustments for inflation, although not legally obliged to do so. Inflation adjustments continue to be made for tax purposes, but these adjustments are not required to appear in the accounts. Recently the Central Bank of Uruguay has required inflation adjustment of the accounts of financial intermediaries (from December 1994), insurance companies and pension funds (from 1995), and large debtors to the banking system (from 1993). The methodology used is of a CPP variety.

CONCLUSIONS

It is apparent from our survey that the use of CCA, and its support by standard setters, has declined drastically since the early 1980s. In the light of history, the early 1980s can now be seen as the high point of the 'CCA revolution'.

The decline was led by the USA and the UK, the countries which had pioneered the introduction of CCA standards. Important factors in both countries were a decline in the rate of inflation and a related change in government policies towards inflation. The other English-speaking countries lagged in their introduction of CCA standards, so that, unlike the cases of the USA and the UK, CCA never took root in majority practice and ultimately disappeared. This was the case in Canada, Australia, New Zealand and South Africa. The Netherlands has a much longer tradition of replacement value accounting, on a voluntary and often partial basis, and experienced neither a Current Cost Revolution nor its subsequent collapse. Nevertheless, the Netherlands did see an increase in the popularity of replacement values in the early 1980s and a subsequent decline.

Latin America has experienced more severe inflation rates in the past and has therefore tended to prefer general index adjustments of a CPP type. In Argentina and Brazil, these have recently been withdrawn as a result of lower inflation rates and new economic policies. In Chile, CPP is still practised, as it is, on a mainly voluntary basis, in Uruguay, against a background of high inflation. Mexico has experimented with both CPP and CCA, but CCA has recently fallen out of favour, owing to its alleged subjectivity.

At the beginning of our survey, we proposed five factors which appeared from our earlier work to have influenced the adoption of CCA. We can now comment on how each of these seems to have operated since 1983:

1 *Economic events* (notably inflation rates). These have clearly been important in all of the countries which we have surveyed. Lower inflation rates in the 1980s or later have tended to lead to lower support for CCA in the English-speaking countries and the Netherlands. Equally, the conquest of hyperinflation in Argentina and Brazil has been associated with the abandonment of CPP. The Argentine statement that inflation at a rate above 8 per cent per annum would lead to a need for price-level adjustments in accounts is a specific acknowledgement of the role of inflation in creating a demand for some form of inflation accounting (whether CCA or CPP).

2 *Self-interest* The influence of taxation was perhaps most obvious in the UK, where the decision not to adopt CCA for tax purposes clearly helped to reduce support for it. There is evidence also from Australia and New Zealand that the adoption of CCA for tax purposes would have increased support for it. Another self-interest motive comes from the regulated sector, and it is notable that CCA has been supported by regulated companies in the UK, the Netherlands, Australia and New Zealand, even after it has been abandoned in the non-regulated sector.

3 *Ideas.* The relative popularity of CCA in the regulated sector has been supported not only by the self-interest of regulated bodies but also by new thinking on the subject, such as that in the Byatt Report (1986). Nevertheless, in a period in which interest in price change adjustments has been declining, it is perhaps not surprising that the

intellectual debate on CCA has been less vigorous than in the earlier period of the CCA revolution.

4 *International influences.* Such influences have certainly been strong. The USA and the UK tended to lead the English-speaking world in the introduction of CCA. Equally, they led the withdrawal of CCA, and the effect of this was felt in other countries, notably Canada, Australia, New Zealand and South Africa, where leading companies did not comply with CCA recommendations and professional bodies and standard setters lost heart in their support for CCA.

5 *Accidents of history.* Despite the systematic effects listed above, there are still factors which they are unable to explain, which can be attributed to the historical inheritance of particular countries, or special circumstances prevailing at particular times. The survival of the Dutch replacement value system, for example, is partly due to the unique inheritance of the Dutch accounting profession which, in turn, is partly due to the efforts of certain influential individuals as well as to the unique historical experience of the Netherlands.

Apart from these broad historical factors, it is possible to detect some technical weaknesses in the CCA proposals of the early 1980s which would probably have led to a need for reform even if the other factors had not indicated total withdrawal. In the UK these weaknesses included the conceptually suspect and intuitively unappealing monetary working capital adjustment and gearing adjustment. In both the USA and the UK, the method of valuation was perhaps left too imprecise, so that the use of broad-brush indices was permitted and the users of accounts did not regard the new information as being valuable, particularly in the presence of factors such as technical progress, which renders simple indexation inappropriate. Thus, the compromises and simplifications resulting from the debate described in our earlier book may have left the CCA standards of the 1980s fatally flawed, even if lower inflation rates and a different economic environment had not intervened to destroy the demand for CCA.

NOTES

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1 SFAS 39 ‘Financial Reporting and Changing Prices: Specialized Assets—Mining and Oil and Gas’; SFAS 40, ‘Financial Reporting and Changing Prices: Specialized Assets—Timberlands and Growing Timber; SFAS 41, ‘Financial Reporting and Changing Prices: Specialized Assets—Income-Producing Real Estate’. Later, other specialised standards, SFAS 46 and SFAS 54, dealt with motion picture films and investment companies, respectively.

2 Some would argue (see Swanson and Schriver 1987) that measurement errors in estimating the current cost of fixed assets, in particular inadequate adjustments for technological change, led to the data not being widely used by financial analysts or incorporated in stock prices. The drafting of SFAS 33, arguing that current cost measures should relate to the

assets owned and used by the enterprise and not just the other assets that might be acquired to replace the assets owned, led companies not to adjust for technological change. This was particularly severe in technologically advanced companies such as those in telecommunications. While this was not the intention of SFAS 33, companies clearly interpreted the standard as not requiring changes for advancing technology and this may have led many companies to lose confidence in the numbers provided. See, for example, United Telecommunication quoted in Swanson and Schriver (1987:75).

3 SFAS 70 (of 1982) had previously eliminated the requirements to disclose CPP data for companies that did not use the dollar as their functional currency.

4 In addition to withdrawing SFAS 33, SFAS 89 also superseded SFAS 39 (dealing with mining and oil and gas), SFAS 40 (timberlands and growing timber), SFAS 41 (income-producing real estate), SFAS 46 (motion picture films) and SFAS 54 (investment companies). In addition SFAS 70, SFAS 82 and certain paragraphs of SFAS 69 were also withdrawn.

5 Private communication, April 1996. This section draws heavily on material supplied by Mr Paul.

6 Published by the CICA.

7 For further details see Singer (1991).

8 'From December 1993 to June 1994, consumer prices in Brazil rose 763 per cent. Following the introduction of the real on 1 July 1994, monthly inflation fell to $5\frac{1}{2}$ per cent in July. From June 1994 to December 1994, consumer prices increased by 17 per cent'. International Monetary Fund (1995) *World Economic Outlook*, October, p. 108.

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Section IV
Taxation and regulation

The City-Association Accounting Lectures

THE REFORM OF THE UK SYSTEM OF DIRECT TAXATION

Professor Geoffrey Whittington

Member of the Meade Committee
15 March 1978

The Reform of the UK system of Direct Taxation

Introduction

The title indicates a topic more suitable for a course of lectures than for a single brief discussion. However, the topic has recently been surveyed at great length and in considerable depth by the report of the Meade Committee*, of which I was a member, and my main purpose is to introduce some of the more important ideas contained in the Meade Report. Those requiring a thorough development of these ideas should consult the Report itself. For the benefit of those who do not take this ideal course of action, I should like to make three important qualifications about what follows:

Firstly, the selection of ideas is obviously subjective. It consists of my view of what is most interesting in the Report, but this view would not necessarily be shared by other members of the Committee.

Secondly, it is the main purpose of the Report to spell out alternative programmes for tax reform, not to provide a single panacea. We hope that a number of these programmes (those selected in the final chapter of the Report) would lead to impovements on the present system, and we would not wish to rule any of them out. We have some clear preferences within this selection of programmes (notably a preference for some form of Expenditure Tax as the main personal direct tax), but each member of the Committee has his own individual preferences, and we hope that this is a strength rather than a weakness. The Report shows clearly that the present system of taxation can be improved upon and offers a variety of strategies for doing this which should accommodate the needs of a wide range of political attitudes.

Thirdly, although I shall concentrate on matters of principle, the Report itself provides a thorough treatment of administrative problems. We were very conscious that any reform should lead to a tax system which was simple to administer as well as desirable from a theoretical standpoint, and that the process of reform, which necessarily implies transition, should be administratively possible.

* The Structure and Reform of Direct Taxation, Report of a Committee chaired by Professor J.E.Meade, The Institute for Fiscal Studies, George Allen and Unwin, 1978

Defects of the present UK Direct Tax System

Before considering the reform of the tax system it is necessary to examine the system currently in operation: if this were perfect, the need for reform would not arise! Few would argue that the present system is ideal, but we need to be a little more specific about its deficiencies in order to suggest remedies. There are, of course, numerous detailed deficiencies of the system, a comprehensive list of which would make the Meade Report look, by comparison, a very slim volume indeed, but, at the risk of over-simplification, I suggest that the following three broad headings account for most of these problems: (1) Rate Structure, (2) Differential tax treatment of various forms of saving and investment, (3) Failure to deal with inflation.

(1) Rate Structure. The high marginal rates of tax on very high incomes (up to 83% on earned income and 98% on investment income) are well-known as a common cause for complaint. They provide a strong disincentive for high income earners to work harder, an incentive for them to emigrate, and an incentive to avoid high rates by converting income into capital gains or some other form which attracts a lower rate of taxation.

    What is less well-known, but becoming progressively more obvious, is the so-called "Poverty Trap" which means that vast numbers of wage-earners or potential wage-earners who have low incomes face effective marginal rates of taxation even higher than those imposed on the very highest incomes, when we treat withdrawal of social welfare benefits as a form of taxation. Indeed, it was estimated that, in December 1975, 50,000 families with low incomes faced effective marginal tax rates of more than 100%. This results from the well-intended but unsystematic multiplication of means-tested-benefits designed to alleviate the problems caused by the failure of social welfare benefits to keep pace with inflation, and from the fact that the income tax threshold is now below the income level at which these benefits cease to be available. For example, in the case of a married man with two children, earning £35 per week in July 1977, the process of earning £1 would lead to a lowering of post-tax and post-subsidy income by 6p, an effective marginal tax rate of 106 per cent! This clearly constitutes an alarming disincentive to work.

(2) Differential tax treatment of various forms of saving and investment. This may seem to be an abstruse complaint, but examination of Chapter 4 of the Meade Report will show that it is a very important aspect of our current system of taxation. Various forms of investment by business are treated differently, some receiving an immediate 100 per cent write off against taxable income, and some receiving nothing at all. Various forms of business enterprise are also treated differently, companies paying corporation tax and unincorporated enterprises paying income tax. Furthermore, various forms of finance are treated differently retained profits in a company bearing corporation tax, dividends carrying imputation relief but bearing the shareholder's personal income tax, and interest being a fully deductible expense against corporation tax (or, in the case of an unincorporated business, against the proprietor's income tax) but bearing

the lender's personal income tax. The interaction of these factors (as summarised in Table 4.7 of the Meade Report) means that a business able to earn a pre-tax rate of investment of 10% per annum would be able to pay a post-tax return on savings varying from 0.1% per annum (on equity finance provided by a shareholder with a marginal income tax rate of 98% for an investment which did not attract 100% initial capital allowances) to 58.8% per annum (for loan finance by a zero-rate taxpayer, such as a charity, to an unincorporated business whose proprietor' marginal income tax rate was 83%, for an investment attracting 100% initial capital allowances).

Moreover, the distortion is further increased by the differential tax treatment of different forms of personal saving. For example, contributions to pension funds are deductible from taxable income and life assurance premiums receive a more restricted income tax concession, but saving associated with the simple acquisition of stocks and shares, deposit accounts, or cash, receives no special tax relief. Finally, income which is regarded as a "capital gain" is subject to taxation only when realised, and then only at a reduced rate.

The combined result of all these discriminatory features of the tax system seems likely to be highly undesirable. Any discrimination without reason may be thought to be undesirable, e.g. it seems, on the face of it, to be arbitrary and pointless for our corporation tax system to have virtually killed off the preference share and to have encouraged the issue of convertible loan stocks rather than equities, when there is no evidence that preference shares are an undesirable method of financing or that convertibles are particularly desirable. However, there is one important aspect of the discriminatory treatment of different forms of saving which might be considered particularly undesirable, namely that it encourages the institutionalisation of savings, through such media as pension and life assurance funds. This must naturally encourage the channelling of funds through the stock market to larger quoted companies rather than to smaller businesses. Even the proprietor of a small business receives a tax subsidy for channelling his personal savings through a pension fund, rather than ploughing them back into his own business.

(3) Failure to deal with inflation. Inflation poses two distinct problems for the tax system. These are dealt with in Chapter 6 of the Meade Report. Firstly, a tax with a progressive rate structure becomes more burdensome as inflation takes place, if the rate brackets are kept constant in monetary terms. This leads to the phenomenon known as "fiscal drag"—a tendency for tax revenue to rise disproportionately as a result of inflation. A specific example, already quoted, is the failure of the income tax threshold to be raised in line with inflation, which has caused many low wage-earners, including many who are receiving social welfare benefits, to become subject to income tax, in recent years. The method of dealing with this problem is bracket indexation, i.e. increasing the range of the relevant tax rate brackets in proportion to increases in the cost of living.

Secondly, the distiction between capital and income, which is a crucial component of an income tax, is distorted by inflation. For example, building society depositors currently pay tax on interest received (or the building society pays it on their behalf) although the gross interest payment is, in fact, inadequate (or barely adequate) to compensate for the loss of the real value of their capital, at

current rates of interest and inflation, i.e. the real rate of interest is negative (or zero). On the other hand, the borrower receives income tax relief on his money interest payments, despite the fact that the real rate of interest which he pays may be zero or negative, since the real burden of his money debt is reduced by inflation. A possible solution to this problem is, of course, to recognise real capital gains or losses as part of the tax base.

A topical example of this second type of problem is capital gains taxation. Capital gains measured in money terms can also be illusory in a period of inflation—if I bought an asset a year ago for £100 and I sell it now for £105, I have made a money gain of £5, but with inflation of, say, 10 per cent during the period, I really need £110 to maintain my capital in real purchasing power, so that I have made a loss of £5 in real terms. The current proposal for the indexation of capital gains thus has much to recommend it, whereas tapering relief is a pragmatic attempt to achieve a similar result, but without adjusting precisely for the effects of inflation.

Fundamental weakness of the present system

It is possible to regard the defects of the present system as the symptoms, rather than the disease, i.e. there may be basic characteristics of the way the system is designed which make it prone to such problems and which need to be reconsidered when designing a programme for reform. I suggest that there are three such characteristics:

(1) The present system has grown in a pragmatic manner rather than by a process of planned evolution. Successive governments have adjusted the system, added new taxes, removed others, and stopped loopholes, but rarely has this been accompanied by a consistent and systematic view of how the tax system as a whole is supposed to work. Thus, for example, the response to inflation has been to introduce stock appreciation relief, but not to tax gains or allow losses on monetary liabilities or assets, and tax rates have only partially and spasmodically been adjusted to compensate for inflation.

It would seem desirable to adopt a more systematic approach to the design of the tax system, for at least two reasons. Firstly, the tax system has an extremely important effect on our economy, and it seems desirable to design the tax system in such a way that it has favourable rather than unfavourable effects. This may seem a rather idealistic argument to practical men who are concerned with the practical administration of the tax system and regard it as a necessary evil, rather than a potential instrument for good (or less evil). The practical man is more likely to be swayed by the second consideration, namely that a tax system which is created by accident rather than by design is more likely to contain anomalies, inconsistencies and loopholes.

(2) The present direct tax system purports to be income-based. The two central components of our direct tax system, income tax and corporation tax, both purport to be based upon income. Thus, insofar as they do have a basic philosophy, they are concerned with the separation of income from capital. This leads , in an un-indexed system, to the anomalies resulting from inflation, which were described earlier.

However, even in the absense of inflation it is, in practice, extremely difficult to maintain a consistent and precise distinction between income and capital. The nineteenth century legalistic distinction between the tree (capital) and the fruit (income) proved to be inadequate and has been modified by a complicated mass of case law and legislation. One of its consequences was that depreciation was not allowed as a business expense. This was subsequently remedied by capital allowances, which have changed greatly in form and amount in recent years, and which do not apply to all forms of investment. Another consequence of the income/capital distiction was the concept of a capital gain, which was not treated as taxable income, and which led to our present very unsatisfactory system of capital gains taxation.

(3) In fact, the present direct tax base is in many respects nearer to an expenditure base than to an income base. Although we struggle to maintain the capital/ income distinction and refer to our central direct tax as an income tax, the complicated web of tax reliefs for saving and investment, referred to earlier, means that the tax base is, for many forms of saving, effectively expenditure rather than income. The characteristic of an income tax is that all income is taxed when it arises, irrespective of whether it is saved or spent on consumption. An expenditure tax, on the other hand, taxes only consumption, so that net savings are deducted from income for tax purposes, i.e. Expenditure=Income+Saving− Dis-saving. This is precisely the tax treatment accorded to pension funds in the United Kingdom at the present time: contributions to pension funds are deducted from income for tax purposes, and the subsequent pension received (which contains an element of income and an element of dis-saving from earlier contributions) is taxable. There are other savings and investment reliefs, such as the 100% first-year capital allowances (with subsequent balancing charges) on some forms of business investment, which also have this characteristic, and their combination in certain situations (e.g. investment by a pension fund in a company which receives 100% initial allowances on its investment) leads to an even more favourable treatment of saving than would be given by an expenditure tax.

Thus, our present direct tax system achieves the worst of both worlds in retaining some of the complications of income taxation, whilst allowing many privileged forms of investment which turn it into an expenditure tax for anyone who is able to take advantage of these privileges. Moreover, there is gross discrimination between different forms of saving and investment, some receiving reliefs in excess of those which would be granted under an expenditure tax and others receiving no relief at all. The documentation of this situation may be the Meade Committee's most important contribution to our understanding of the deficiencies of our present tax system.

The case for an Expenditure Tax

In the light of this analysis, it is easy to see why an overwhelming majority of members of the Meade Committee preferred an Expenditure Tax (subsequently referred to as ET) as the main direct tax. An ET would eliminate the three fundamental weaknesses of the present system. It would provide a theoretical bases for planned evolution, rather than the pragmatic adjustments which have characterised the past. It would eliminate the

capital/income distinction and introduce a tax base which was based mainly on current transactions, eliminating the need to value capital. In the particular case of inflation, the capital adjustment problem would no longer arise, although bracket indexation would still be necessary if ET were to be levied at progressive rates. Finally, an ET base would retain many of the tax reliefs for saving and investment which are built into the present income tax system, but would remove the distortions caused by giving different degrees of relief to different forms of saving and investment.

Moreover, expenditure is attractive as a tax base from the point of view of equity. The idea of taxing people on what they take out of the economy rather than what they Put into it has attracted support for more than three centuries—a well-known advocate was Thomas Hobbes, the seventeenth century philosopher. It certainly seems likely that many of the complaints about unequal incomes are based upon the unequal life-styles which they make possible, rather than on unequal savings. Thrift is widely regarded as a virtue, and it is a feature of ET that saving is not discouraged. Under an ET, the post-tax rate of return obtainable by foregoing consumption is equal to the pre-tax rate of return on investment, whereas under an income tax (which does not give savings relief) it is the pre-tax rate of return on investment, less the rate of income tax on the returns.

However, I am academic enough to point out that, although I find it convincing, the case for an ET is not overwhelming. The Royal Commission on Taxation in Canada (1966) (known as the Carter Commission) came out in favour of a Comprehensive Income Tax (CIT), which it described in great detail. An income tax of this type would deal with two of the fundamental weaknesses described earlier: it would provide a systematic and consistent plan for reform, and the treatment of savings and investment would be standardised on a “no-relief” basis. Moreover, the comprehensive income tax also has a plausible-sounding justification from the point of view of equity: it is based on taxing all gains in economic power equally, irrespective of the source or the use. It is the second fundamental weakness, the capital/income distinction, which the comprehensive income tax fails to eliminate. The Carter Commission’s practical proposals sounded extremely complex at the time (and were not implemented), yet these proposals did not attempt to deal with inflation, a problem which has now become much greater and adjustment for which adds to the complexity of any income tax system.

How an Expenditure Tax would work

We already have an expenditure tax, or, more accurately, a number of expenditure taxes, in the form of Value Added Tax (VAT) and various excise duties. These taxes are not appropriate as general taxes on expenditure, which might be substitutes for income tax, for two main reasons. Firstly, they impose different rates on different commodities. Secondly, they are not progressive in their rate structure, and it is funda-mental to their administration that the amount of expenditure by any individual person is not recorded.

Two types of general expenditure tax system are given full treatment in the Meade Report (chapters 9 and 10), a Universal Expenditure Tax (UET) and a Two-Tier Expenditure Tax (TTET). The former, UET, is simpler to understand and would probably be a natural blueprint to use if the tax system were being designed from scratch, with no transitional problems. It is simply a tax on receipts (i.e. income plus dis-savings plus

other receipts) less savings. The latter system (TTET) was the mechanism of a VAT to collect basic rate tax and applies an individually assessed tax of the UET type (but applied to a much smaller number of tax payers) to collect the additional rates of tax applied to taxpayers with very high levels of expenditure, i.e. in order to introduce progressivity into the system. This system involves two taxes, and therefore sounds more complicated than UET. However, it appears less complicated on closer acquaintance and has some important administrative advantages, particularly with respect to transition from the present system.

An individually assessed expenditure tax of the UET type would be administered in much the same was as our present income tax, being based on a periodic return by the individual taxpayer. However, if the tax were truly universal, the adjustment for net savings would mean that annual returns were required from virtually all taxpayers, whereas at present some 60 per cent of taxpayers make returns only once in five years. Because of this additional administrative burden, we suggest that a system of self-assessment would be highly desirable in order to administer UET. Such a system already operates successfully in the USA, and there are indications that it may be introduced in the UK even in the absence of tax reform. One of the advantages of TTET is that it would not necessitate such rapid or radical administrative reform: only those likely to pay ET at above the basic rate need make annual returns.

As explained earlier, the tax base for UET would be receipts, less savings. Receipts would be based upon transactions for the relevant period: they would include income received (earnings, dividends, interest received, less interest paid, and profits of unincorporated businesses), plus borrowings and receipts from the sale of assets which had previously been eligible for savings relief ("registered assets"), plus gifts and inheritances received and other windfalls (such as gambling winnings). Savings would be measured as the amount spent on repaying debts which had given rise to taxable receipts and on the acquisition of assets eligible for relief ("registered assets"). Gifts would also be deductible in calculating the donors expenditure, on the assumption that there would be a separate gifts tax based on lifetime accumulation.

The concept of a registered asset deserves some elaboration. This is a device for clarifying the expenditure/savings distinction, which might otherwise become almost as troublesome under an ET as is the income/capital distinction under an Income Tax. We suggest that registration would be compulsory for a wide range of financial assets. Registration would lead to ET relief at the time of acquisition, and subsequent taxation of the proceeds of realisation (including capital gains). Unregistered assets would not receive relief when acquired and subsequent receipts on disposal would not be taxed. The class of unregistered assets therefore requires restriction, and a Capital Gains Tax would probably have to be retained for those unregistered assets (particularly valuable personal chattels, such as antiques and paintings) which might appreciate in capital value.

We also propose that borrowing should typically be registered. Thus, receipts of a loan would be taxed and the subsequent repayments (both of interest and capital) would attract tax relief. Thus, if I bought a house which was a registered asset and financed the purchase by means of a registered building society loan, I would receive tax relief for the year of purchase on the excess of the cost of the house over the amount borrowed. Subsequent repayments to the building society would then be tax-deductible, irrespective of whether they were interest payments or capital repayments. Sale of the registered

house would give rise to a taxable receipt, but repayment of the loan would give rise to a relief, and relief could also be obtained on the purchase of another house.

It is also possible to contemplate a category of unregistered borrowing. Receipts of such loans would not be taxable but interest payments and repayments of the capital sum would not be tax deductible. They would enable consumers of expensive/ unregistere durable goods to smooth their expenditure for tax purposes over the life of the loan, thus avoiding penal marginal tax rates in the year of purchase. There would be no other clear advantage to the taxpayer, but we feel that this form of borrowing should be restricted, to avoid the accumulation of vast quantities of registered assets financed by unregistered borrowing: these assets would be subject to heavy taxation when realised, but the millionaire who had no ET liability whilst he was accumulating registered assets out of unregistered borrowing would not be good for the popular image of ET, or for revenue in the period prior to realisation of the assets.

One central issue relating to the registered asset system is the question of transition. If UET were introduced at a single stroke on an appointed day ("D-Day") we would have three possible treatments of existing assets: register all assets, registe a restricted range of assets, or register no assets. The first option, registration of all assets, would involve a capital levy on all assets held at D-Day: no new savings relief would be given, but subsequent receipts from realisation would be taxed This might be attractive to those politicians who are particularly concerned with the uneven distribution of wealth, but it would be very arbitrary in its effect. For example, there would almost certainly have to be some relief for older taxpayers who had been accumulating assets under our present tax regime (with or without savings relief, depending on the form of their savings). The second possibility, registration of a restricted range of assets, would be favourable to those who held unregistered assets and harsh on those who held assets which were to be regarded as registered.

There would also be considerable disturbance in asset markets between the announcement of the tax and D-Day, as people tried to switch from registered to unregistered assets. Finally, the third possibility, treating all assets as unregistered at D-Day, would be extremely favourable to wealthy taxpayers, who could avoid ET for years to come by progressively registering their assets.

The Meade Committee did not claim to find an entirely satisfactory solution to this transitional problem, although various possibilities were discussed, and it is quite possible that an appropriate transitional programme could have been devised, had the Committee had longer to deliberate upon the problem. However, in our present state of knowledge, it is one of the advantages of TTET that it might reduce the transitional problems and, indeed, that it might serve as a transitional arrangement on the way to UET, the top tier being gradually expanded to accommodate more taxpayers.

There are other problems associated with ET, whether in the form of UET or TTET, notably the problem of emigrants who save in the UK but subsequently spend abroad. For discussion of this and other issues, reference should be made to the Meade Report itself, for which this brief lecture is no substitute.

Flow of Funds Corporation Tax

The Meade Report deals with the direct tax system, not merely with individual taxes in isolation: failure to consider effects on the system as a whole has been a serious weakness in our past pragmatic methods of tax reform. It is impossible here to do justice to any of the complete systems: these are outlined in the final chapter of the Meade Report. However, by way of illustration of the relationship between two systems, I shall now outline the Corporation Tax which seems to be most consistent wit an ET (although it is also consistent, in some circumstances, with CIT), the Flow of Funds Corporation Tax.

For consistency with an ET, we require that the Corporation Tax should have the basic ET property that the post-tax rate of return on consumption foregone should equal the pre-tax rate of return on investment, i.e. the tax system should not discourange saving and investment by reducing the rate of return. We also require that this relationship should hold, irrespective of the form of financing or investment.

Our present Corporation Tax clearly fails to meet these requirements. Although it treats some forms of investment in the ET style, by allowing complete write-off of the cost against taxable profits in the first year, it does not make such an allowance to all forms of investment. Also, different forms of finance are treated differently: loan interest is fully deductible as an expense against corporation tax and dividends receive imputation at only the basic rate of income tax.

The Flow of Funds basis for Corporation Tax is best understood in what is called the "S" form ("S" for Share), which most members of the Meade Committee preferred as a long-run ideal. The "S" base for Corporation Tax is, in its tax-exclusive form, simply:

$\bar{S}$, Payments to shareholders less S, Receipts from Shareholders

where $\bar{S}$ includes: Dividends paid (before personal tax)
Capital payments to shareholders (e.g. on liquidation)
Shares in other companies bought

and S includes: Dividends received
Capital received from shareholders (e.g. in respect of new issues)
Shares in other companies sold

It can be seen intuitively that this is an expenditure-type basis. Companies do not consume but their shareholders do, and this tax base consists of net disbursements to shareholders (dealings in shares of other companies have to be included for consistency and to prevent avoidance).

More precisely it can be demonstrated that this system treats all forms of saving and investment equally and the post Corporation Tax rate of return payable on financing always equals the pre-tax rate of return received on investment. For example, equity shares receive relief against Corporation Tax when they are issued, so that if the Corporation Tax rate is 50 per cent (tax inclusive), the amount raised from shareholders is doubled by the amount of tax saved (the Meade Report discusses the possibility of cash refunds where the "S" relief exceeds the company's tax base, $\bar{S}$, for the year). Subsequent returns will therefore be based on twice the amount subscribed by the shareholders, but

when these returns are distributed the government will take its share (one half), leaving the shareholders with the full return on the amount which they subscribed to the company. If equity finance takes the form of retained profits rather than a new subscription of capital, a similar relationship holds: the "S" relief now takes the form of avoiding tax by not paying a dividend (i.e. $\bar{s}$ is lower, rather than S being higher, but with the same net effect on the tax base $\bar{s} - s$).

In the case of loan financing, raising the loan does not give rise to tax relief (since relationships with shareholders are unaffected by the transaction), but the subsequent payment of interest, and redemption of the loan, do not attract taxation. Thus, loan stocks also can receive a post-Corporation Tax yield equal to the pre-tax rate of return on investment. It should be noted that both interest and dividends would be subject to personal ET in the hands of the stockholder or shareholder. Then would be no imputation in the system. The reason for this is that companies would receive "S" relief against Corporation Tax and shareholders would receive savings relief against ET, for the acquisition of registered assets. Thus, there is one relief for each tax: any further relief would provide a positive subsidy such that the post-tax rate of return exceeded the pre-tax rate of return.

It might be asked whether such a generous Corporation Tax would yield any revenue. In fact, the Meade Report suggests that it would probably have a tax base not very dissimilar in size from the present one. There are three reasons for this :

(1) Only new finance would attract "S" relief, and there are huge sums already invested in the company sector.
(2) Insofar as there were pure profits (i.e. profits are a rate in excess of the rate of interest) on new investment, these would be taxed. The "S" basis implies that the government effectively takes an equity interest in companies: subscribing a proportionate amount of new equity and taking the same proportion of the subsequent yield. Insofar as companies' equity rates exceeded the government's borrowing rate, there would be a positive return to the government.
(3) The present Corporation Tax system already has some important features of the "S" basis. Equity finance already receives a relief equivalent to "S" relief insofar as it is used to finance assets which attract 100% initial allowances. Interest paid on loan stocks is fully deductible against income for Corporation Tax.

The "S" basis is not the only Flow of Funds Corporation Tax base considered in the Meade Report. The "R" and "R+F" bases might have simpler transitional properties and be easier to comprehend for those used to the present system. They also might have advantages in being less generous to companies investing overseas which already receive double taxation relief and may therefore be thought to be unsuitable candidat fof "S" relief. In fact "R+F" is only "S" measured (on a tax inclusive basis) from the other side of the flow of funds identity, so that its theoretical properties are similar, although its administrative implications are different. However, those interested in the finer details and variations must refer to Chapter 12 of the Meade Report. We must now turn to a brief review of some other aspects of taxation.

Capital taxation

Chapters 15 and 16 of the Meade Report deal with the important and topical subject of capital taxation. It is customary to distinguish between taxes on holding wealth and taxes on transferring wealth, but Chapter 15 proposes, inter alia a tax which might combine these two bases, a PAWAT or Progressive Annual Wealth Accessions Tax. Its basic philosophy is that the dispersal of wealth should be encouraged, so that it is progressive with respect to cumulative lifetime accessions by the donee (rather than transfers by the donor, as under our present Capital Transfer Tax). It is constructed on the assumption that a transfer tax on wealth is meant to tax the future benefits to be derived from the wealth before it is next subject to tax: the rate is therefore higher the younger the donee and the older the donor. Finally, it is assumed that the community is particularly averse to inherited wealth rather than saved wealth, so that the latter form of wealth is exempt from PAWAT in the hands of the person who originally created the wealth.

We would not claim to have solved all the practical problems of PAWAT, but it would fit in very well with an ET personal tax system and is worthy of further investigation. As an alternative, which has less practical problems but is less elegant in conception, the combination of a LAWAT (Linear Annual Wealth Accessions Tax) i.e. a PAWAT which is not progressive with respect to cumulative accessions, and an Annual Wealth Tax (AWT) with a high threshold, is a system which has much to commend it. Either this system or a PAWAT would be much more consistently designed to achieve desirable social objectives that the combination of the present CTT with a compromise AWT of the type which may emerge from the current government's commitment to wealth taxation,

New Beveridge

One aspect of the Meade Report which it is not possible to deal with in any detail here, is the reform of the Social Security system, with a view to eliminating the Poverty Trap. The elegance of some form of negative income tax system has a great deal of theoretical and administrative attraction, but there is one main drawback, the cost. In designing such schemes, if we hope to eliminate poverty and, simultaneously, the disincentive effect of applying high marginal tax rates to low incomes, we shall inevitably incur a heavy expense on the exchequer. It must be remembered that the marginal tax rates and subsidies applying to low incomes will also affect the average tax rates of those on higher incomes.

As a result of such considerations, the Meade Committee opted for what is described as a New Beveridge Scheme. This tries to relate benefits to need rather than to income, in the spirit of the original Beveridge plan. Thus benefits would be given primarily for unemployment, sickness, retirement, dependent children, and home responsibilities, rather than being directly related to income. Most of the benefits would be taxable, which would reduce the cost of the scheme on a consistent meanstesting basis (the marginal rate of personal tax). The benefits would be at rates adequate to raise the recipients to a satisfactory living standard, and the tax threshold would be raised above the poverty line,

so that the present situation in which those in need simultaneously pay tax and receive income support would be eliminated. There might still be some need for additional assistance for low-paid workers, but this would depend very much upon the rates of benefit and on the form of the personal tax system.

Once more, it is necessary to refer to the Report (Chapter 13) for further discussion, but it must be emphasised that, despite its brief discussion on this occasion, the New Beveridge scheme is one of the most important proposals in the Report.

Other issues

There are many other issues in tax reform which it has not been possible to refer to here, but which did receive serious attention from the Meade Committee. Two particularly difficult issues were the tax unit (especially the treatment of married couples) and tax relations with foreign countries (especially the questions of double taxation relief for companies and emigration by persons). Housing also received much attention and it became clear that some form of taxation of the benefits of owner occupation (as under the former Schedule A tax) would be desirable under either an ET or a CIT system. The relative taxation of earned income and unearned income, the role of National Insurance Contributions, the treatment of trusts, and the overall rate structure were also discussed in some detail. Finally, but certainly not least, the question of administration was discussed in a separate chapter, but was also considered as an integral part of the discussion of particular taxes elsewhere in the Report.

Concluding remarks

I hope that I have convinced you that the present UK system of direct taxation has serious deficiencies. I also hope that I have persuaded you that it is desirable that tax reform be carried out in a systematic manner which is consistent with the objectives of the system. I do not think that it is realistic to hope that I have persuaded you that the system should be reformed on an expenditure basis, but I hope that you are now aware of the extent to which our present system has already moved in this direction. Above all, I hope that I have persuaded you to study the Meade Committee Report and, furthermore, that this will lead to further rational discussion of alternative strategies for the reform of our system of direct taxation.

4
REGULATORY ASSET VALUE AND THE COST OF CAPITAL

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The Regulatory Context

THE UK UTILITY COMPANIES WERE PRIVATISED on the understanding that they would be regulated on a price-cap basis, rather than the rate of return basis prevalent in the USA. It was believed that the price cap would provide an incentive for companies to cut costs and increase profits within the period for which the price cap was set. When the price cap was re-set, at the end of a regulatory period, the information revealed by the economies achieved in the previous period could be used to benefit the consumer over subsequent periods.

Experience since privatisation has shown very clearly that price-cap regulation does not avoid the need for calculating the rate of return, with its attendant difficulties. When the price cap is reviewed, projections are made of the prospective cash flows resulting from alternative price caps. In choosing an appropriate price cap, a critical factor will be whether the resulting cash flows available to shareholders are excessive, and one method of checking this is to look at the resulting rate of return on a measure of shareholders' funds, that is, the regulatory asset base (RAB). This process has now become a routine aspect of regulation in telecoms, gas, water, electricity and airports. The disparate circumstances of different industries have led to the precise methodology used being different, for example in water, the availability of comparators has meant that studies of comparative efficiency across different companies has been an important part of the regulatory process, whereas in gas distribution this has not been possible because TransCo has a virtual monopoly of the pipeline network. However, there is a fundamental similarity between the bases used in different industries, and this has become more apparent as a result of appeals to the Monopolies and Mergers Commission (MMC) by regulated industries. The MMC has sought to be consistent in its decisions and this has led to a degree of convergence across industries, not least in the rate of return allowed on the RAB. Some key points of recent MMC decisions in this area are summarised in Appendix 1.

[1] The author is grateful to Richard Barker, Michael Beesley, Richard Green, Geoff Meeks and Michael Pollitt for comments on an earlier draft, but any remaining errors are the sole responsibility of the author.

The most important recent MMC pronouncement on this topic has been its 1997 Report on British Gas, which largely followed the 1993 report but amended it in some important respects. British Gas will be the main focus of the practical illustrations in this paper, although the principles apply to other regulated industries. The object of the paper is to discuss the critical issues relating to the establishment of a regulatory asset base and, to a lesser extent, the selection of an appropriate rate of return. It is not intended to discuss whether price-cap regulation in its present form is the most appropriate system, but it should be noted that its two principal rivals, rate of return regulation and profit sharing, involve using the rate of return on regulatory assets more frequently than does the price-cap approach. Hence, the difficulties of measuring the asset base and establishing a fair rate of return will tend to be compounded under these alternative regulatory regimes.

1. The Regulatory Asset Base (RAB)

In establishing the RAB upon which a rate of return is allowed, four distinct issues have emerged in the development of the regulatory process over the past decade.[2] These are, first, the valuation of the initial regulatory base, second, the up-dating of the regulatory base to allow for price changes, third, the treatment of depreciation, and fourth, the treatment of new investment. These will be considered in turn, with comments on their treatment in the recent British Gas report.

1. Valuation of the Initial Regulatory Asset Base

By the initial RAB, we strictly mean its value at the time of the flotation of the company, although it is possible to fix it at a later date.

There are two competing valuation concepts which can be used: the flotation price paid by shareholders, and some measure of the valuation of assets (usually at current cost or replacement cost) less current liabilities.[3] The latter has not found favour with regulators in cases in which it gives a notably higher answer than the former, that is, the market-to-asset ratio (MAR, which is the ratio of stock market value to asset value) is less than one. The two leading examples of this are gas (where the MAR on flotation was about 0.4) and water (where the typical MAR was much lower). Despite some hopeful claims by water companies that they should be regulated on the Indicative Values set at privatisation, there has been general acceptance of the market value approach adopted by

[2] See, for example, para 2.105 of the 1997 MMC Report on British Gas.

[3] For simplicity, the subsequent arguments and illustrations are framed in terms of an RAB which is attributable entirely to shareholders. Other sources of long-term finance, such as loan stocks and convertible securities, would, of course, add to the RAB in practice, and the rate of return should be adjusted to take account of the cost of such finance.

the regulators and the MMC. To adopt a replacement cost or current cost approach at this late stage would involve a very large transfer of wealth from the consumer to the shareholder, which would be inconsistent with the requirement that the regulator strike an appropriate balance between these interests by allowing a return sufficient to justify the shareholders' investment but not excessive from the perspective of the consumer.

Thus, the accepted purpose of the regulatory base is to establish the amount of funds on which the shareholder is entitled to a return, and this amount is established, at least initially, by reference to the funds attributable to the shareholder, that is, the amount originally subscribed on flotation or some variation of that. The variations which have been implemented have been designed to cope with the instability of the share price at the time of privatisation and the belief that the initial premium should be regarded as part of the shareholders' initial stake. Thus, the water regulator uses the average share price for 200 days following privatisation as the initial value. The 1993 MMC report on British Gas went much further than this and used the 1991 share price (five years after the 1986 privatisation and immediately before the MMC inquiry was initiated) on the ground that gains up to that time represented the initial discount on privatisation and subsequent efficiency improvements obtained by the company which could reasonably be expected to benefit shareholders. It was, however, recognised that this was essentially an *initial* valuation which could not be repeated as part of the future regulatory process. Otherwise, there would be circularity in the process, share prices depending on expected regulatory decisions, and regulatory decisions depending on the expectations embodied in the share price.

By focusing on share price at flotation or some later time to establish the initial value of the regulatory asset base, the regulatory system recognises that it is concerned with establishing an appropriate return *of* (in the case of depreciation) and return *on* (in the case of profit) capital to the shareholder. It is therefore concerned with establishing an appropriate valuation of shareholders' funds, rather than a valuation of specific assets, or net assets, of the business. The difference between the two is captured by the MAR. It might be thought that the failure to award a full return on the current value of assets would lead to inefficient investment decisions, but this does not apply to the initial RAB, which relates to assets which were already invested when the regulatory process started. Given the nature of the investment, it is not readily liquidated or transferred to some more profitable unregulated use. In the case of *marginal* investment decisions (decision to make new investments) it is more important that, if the investment is desirable,[4] the regulator should allow a reasonable return on current cost, which will give the regulated company an appropriate incentive to make the investment. This is addressed in 4 below.

The 1997 MMC report on British Gas endorsed the approach of the earlier (1993) report in using a measure based on the 1991 stock market price to establish the initial regulatory value of British Gas.

[4] There is, of course, a judgement about desirability which will have to be made by the regulator, in the absence of any signals which would be provided by the market in an unregulated environment. In some cases, it might be possible to develop a pricing structure based on charging long-run marginal cost which would provide appropriate signals as to the marginal demand for investment in the industry.

2. Adjusting the RAB for Price Changes

Having established an initial value of the RAB, it is necessary to consider how this should be adjusted for price changes when it is carried forward to future periods. The second adjustment which must be made is that for depreciation: this is considered in 3 below.

The regulatory regime based on an RPI minus x formula is essentially defined in real terms (hence the RPI component). Thus, the consumer bears any risk arising from inflation. Equally, the standard methods of allowing the cost of capital (which will briefly be considered later) are designed to produce estimates of the appropriate real return. Thus, for the sake of consistency, we need to adjust the RAB to yield a value which is of constant real value (measured in £s of the particular year) through time. The natural index to use to adjust the initial RAB to a constant real value is a general purchasing power index such as the RPI. This would ensure that the capital fund on which shareholders are given a return is of constant purchasing power through time. It is also consistent with the use of the RPI in the price formula. The use of the RPI to re-state RAB in current prices was adopted by the MMC in its 1997 British Gas report (but not in the 1993 report, so that for purposes of consistency, the later report applied the RPI only from 1997). It had earlier been used by the MMC in its 1996 report on the BAA London airports.

The alternative index, favoured by the MMC in its earlier report on British Gas and by OFGAS in its early years, is a current cost (CC) index, which attempts to capture changes in the current cost of replacing the services embodied in the specific assets underlying the RAB. This description shows the inappropriateness of a CC index if we believe that the RAB represents a capital fund representing the shareholders' investment *in* the firm (which is implied by the MAR adjustment) rather than the specific investments made with those funds *by* the firm. The effect of using the CC indices is to tie investors' returns to the replacement prices of firm-specific assets. As a consequence of this, real holding gains (those representing specific price rises in excess of the RPI) will benefit shareholders (by increasing the RAB) and real holding losses (such as are often caused by technical progress in industries such as British Gas) will disadvantage shareholders. Such a system penalises technical progress (which might be expected to cause holding losses on existing capital assets) in a company which aims to maximise shareholder value. It can also lead to extensive regulatory uncertainty and possibly to dispute over the identification of the appropriate specific index or asset price, which was why OFWAT decided at an early stage to use general rather than specific indices for the re-statement of the RAB.

In summary, by accepting a general index basis for re-stating the RAB, the MMC has adopted a method consistent with the view that the RAB represents a pool of shareholders' funds, rather than a collection of specific investments. The general index has the further advantage of simplicity and objectivity. Its use also removes the risks to shareholders which would otherwise arise from inflation (if no price adjustment were made to the RAB) or from relative price changes (if price adjustments were based on a CC index or specific prices). It might be expected that insuring shareholders against these risks would reduce the rate of return that they would require.

3. Depreciation

The most difficult aspect of the RAB has proved to be depreciation, particularly in so far as it relates to replacement investment. Here, the MMC made an unfortunate decision in 1993 and reversed it in 1997.

The issue of depreciation is quite simple, so long as we start from a clear view as to what depreciation is for. There are two views of depreciation: first, that it represents a return of capital subscribed; second, that it represents a charge for the replacement of assets consumed. The former view is consistent with the use of the RAB as a basis for assessing the investment *in* the firm, attributable to shareholders. The latter view is consistent with the use of the RAB as a measurement of the investment *by* the firm in real assets, and is the view implicit in current cost accounting (CCA). Both approaches to depreciation are relevant to particular problems. For the purpose of establishing an RAB for fixing the price cap, the return of capital approach seems to be the more relevant, because we are concerned with giving shareholders an adequate (but not excessive) return of (in the case of depreciation) and (in the case of profit) on the capital which they subscribed.

If we adopt this approach and apply it to the initial RAB, the depreciation charged will be based on regulatory value, rather than the full current cost of the underlying assets, because it is the regulatory value on which returns to shareholders should be based. Thus, the depreciation charge will be based on the numerator rather than the denominator of the MAR. Alternatively, we can regard it as being based on the denominator (full current cost of the underlying assets), multiplied by the MAR, which gives an identical result. In other words, full current cost depreciation is abated by the MAR. This is the approach adopted in the 1997 British Gas report of the MMC. This is illustrated in (1) of Appendix 2 (below, p. 111).

However, assessing the time pattern of depreciation is essentially an arbitrary process. It is, therefore, fortunate that the amount of depreciation that is deducted from profit in any year for regulatory purposes does not affect the value of total returns to shareholders so long as consistent adjustments are made to the RAB, that is, all depreciation which is charged in the regulatory profit and loss account is also deducted from the RAB, so that it will reduce the capital on which and of which shareholders are allowed a return in the future. This is an important property which accountants call *articulation:* the charge to the profit and loss account should also have an equivalent effect on the relevant item accumulated in the balance sheet.

Provided that articulation with the RAB is enforced, there is no reason why full current cost depreciation cannot be charged in the profit and loss account: the effect of this will be to allow higher prices to consumers now but lower prices in the future, and shareholders will not gain by this re-profiling of the cash flows if the regulator is successful in allowing only a normal rate of return on the RAB. However, in extreme cases, as David Newbery has pointed out (Newbery, 1997), this might lead to the RAB becoming negative, because the accumulated total of depreciation allowed exceeded new investment to such an extent that the shareholders' investment was effectively refunded in full. This is illustrated in (2) of Appendix 2 (below, p. 112). In such a case, the

shareholders would ultimately have to refund the over-payment (and interest thereon) to the company, for the benefit of consumers.

The 1993 MMC report on British Gas encouraged the logical error (which was recognised apologetically in Volume 2, paras 7.78 to 7.80) of breaking the articulation between the depreciation charge and the RAB. A full current cost depreciation charge was allowed as a charge against profit, but only that proportion attributable to regulatory value (full current cost abated by the MAR) was deducted from the RAB. This is illustrated in (3) of Appendix 2 (below, p. 112). This did not affect the overall judgement made about the price cap in 1993 (and the subsequent performance of British Gas shares does not suggest that this price cap was over-generous, for example, see Figure 6.2 of the 1997 report), but it did lead to some misguided expectations, or hopes, by the regulatee, which were dispelled by the 1997 report.

4. The Treatment of New Investment

New investment, that is, investment taking place after the initial RAB is established, should be added to the RAB at cost and rolled forward by whatever price index is applied to the initial RAB. Any subsequent depreciation of the investment should be charged against profit for regulatory purposes.

This treatment of new investment is consistent with the concept of the RAB as representing shareholders' investment *in* the company, and it is also the treatment adopted by the 1997 MMC report on British Gas. New investment represents an additional investment *by* shareholders in the regulated business: if it did not qualify for an adequate return as an addition to the RAB, the funds might well be invested outside the regulated business. Equally, depreciation charged against regulatory income represents a return of their investment *to* shareholders and therefore reduces the size of the fund on which they are entitled to a return. Provided that depreciation and investment are treated symmetrically, it is not necessary to make a distinction between replacement investment and new investment. All investment (including replacement) adds to the RAB and all depreciation is deducted from it, so that a regulated firm whose investment equals its depreciation charge has a constant RAB. In retrospect, it seems that the 1993 MMC report on British Gas did not express this point clearly enough. Equally, there has been an unnecessary anxiety expressed by OFGAS and others (particularly the shippers), that the depreciation charge should not exceed investment: provided that the depreciation charge is deducted from the RAB, the lack of replacement investment means that the RAB will decline and, with it, regulated profits. A supporter of British Gas might well argue that OFGAS should have no anxiety about the adequacy of investment (replacement or otherwise) if it really is offering an adequate rate of return on RAB and a stable regulatory environment within which British Gas can invest with confidence. These issues will be taken up later.

There is one other important issue with respect to new investment. This is the choice of anticipated or actual expenditure. Clearly, at the beginning of the regulatory period, it will be necessary to include anticipated investment in the budget on which the price cap is based. However, at the end of the regulatory period, the regulator has three choices: first, add *actual* capital expenditure for the past period to the RAB and claw back any excess returns due to under-spending of the budget (possibly with compensation where

there is over-spend); second, add actual expenditure to the RAB without claw-back or compensation; and third, add *anticipated* expenditure to the RAB with no adjustments for deviation of the actual spend.

Which of these is appropriate depends on the circumstances of the time and the industry. Full claw-back (the first option) removes any incentive for the industry to exaggerate anticipated expenditure relative to actual, but it also removes any incentive to find real economies in capital expenditure. It is therefore inconsistent with the principle of price-cap regulation and would be resorted to only if the regulator did not trust the industry's good faith in making its projections, or if there were some drastic change in circumstances (as in the case of water companies being given compensation for having to invest to meet new environmental requirements). The second option provides some incentive, within the regulatory period, to economise on investment expenditure and is broadly the stance taken in the 1997 MMC report on British Gas. The third option has merit where there are large, long-lived investment projects which offer large potential savings if they are well designed and managed. This approach has been used by OFWAT, and it should be noted that, although it gives the companies a greater incentive to be efficient, it also imposes greater risks on them, if their anticipations are not fulfilled.

The treatment of new investment will, in part, depend upon the confidence felt by the regulator in the information which is available about investment needs. This raises the important issue of *learning:* regulators are continuously accumulating more information about the industries that they regulate, and improving their insight into the underlying financial and productive processes, whether through models or by less formal processes. This means that regulation is a dynamic rather than a static process, so that we should not attempt to freeze it at a particular stage of its development. Hopefully, the learning process is not confined to the regulator, and the regulatee also learns more about its own business by responding to the regulator's questions. Thus, regulation may perform a positive role in making efficiency improvements possible, as well as providing incentives for them to be realised.

Summary on the RAB

The discussion of the RAB has supported the general approach of the 1997 MMC report on British Gas. This involves an initial RAB based on a stock market valuation of shareholders' interests. New investment is added to the RAB and full depreciation (the same as is charged against regulatory income) is deducted. It is preferable that this depreciation be based on RAB rather than some larger CCA valuation, but the articulation between the income statement and the RAB should ensure that shareholders do not gain in the long term, whatever depreciation schedule is adopted (provided that it is understood that the RAB might become negative in extreme cases[5]). What is wrong, or at least inconsistent, is to follow the MMC's 1993 methodology of deducting full CCA depreciation from the regulatory income but deducting only a proportion of it from the RAB. In carrying forward the RAB we need to adjust for price changes, and a general

[5] A negative RAB would imply negative returns and would ultimately have to be discharged by further contributions from shareholders, if consumers were to be treated equitably.

index is to be preferred to a specific (CC) index for this purpose. This and the other conclusions are all derived from the fundamental assumption that the RAB, and the return on it, are supposed to reflect the investment in the firm rather than investment by the firm in the regulated activity.

2. The Regulatory Rate of Return (RRR)

The RAB is combined with a regulatory rate of return, RRR, to establish the acceptable level of regulatory profit. The RRR has therefore attracted as much attention and discussion as the RAB in regulatory cases. However, the MMC's response to the RRR question has been much clearer than its answer to the RAB question. The answer, according to the 1997 report on British Gas, is 7 per cent per annum, and this is consistent with earlier reports (see Appendix 1, below, p. 109). This is supposed to be a fair pre-tax real rate of return on long-run investment in a privatised utility. It represents a weighted average cost of capital (WACC), including both the debt and the equity elements in long-term financing.[6]

It would be easy to mock the 'magic' number 7 per cent as being arbitrary and lacking a sound theoretical or empirical underpinning, rather like 42, which was the answer to the Ultimate Question in *The Hitch-Hikers Guide to the Galaxy*. However, there are two important differences. First, the Ultimate Question was not known, whereas we do know the question that we are trying to answer in the case of the rate of return: What is the minimum rate of return which providers of finance will require in order to undertake this particular investment? Second, the MMC's rate of return does have an empirical underpinning which is at least as good as that of the alternatives.

The basis upon which the rate of return is calculated is the widely accepted weighted average cost of capital. This weights the components of the financial structure according to their contributions, in terms of market value. Debt instruments are fairly easily dealt with, because interest payments and redemption terms are known. The more difficult component is equity, because future dividends are variable and unknown. In estimating the cost of equity, it is common practice to use the Capital Asset Pricing Model, CAPM, which has respectable theoretical underpinnings in portfolio theory, although it is by no means the only model available.[7] The CAPM estimates the return on equity using three components: the risk-free rate of return, the equity premium, and a parameter β which relates the risk of the individual security to that of equities in general as expressed in the equity premium. There is little controversy about estimating the risk-free rate of return or β. It is generally accepted that the latter is rather less than unity, that is, the regulated utilities are rather less risky than equities in general, as might be expected, although some regulatees have complained that they are subject to high regulatory risk: a natural feeling at the time of a price determination or an appeal to the

[6] Although the earlier discussion of the RAB referred to shareholders, this term was defined rather loosely to include all providers of long-term finance (see note 1).

[7] One alternative is the Arbitrage Pricing Model proposed by Ross (1976). A variant of the CAPM which has a sound basis in micro-economic theory but does not perform so well empirically is the consumption-based asset pricing model. A useful review of the alternatives is Brennan (1992).

MMC! It is the equity premium which has been the real source of uncertainty and contention.

The equity premium is the return which shareholders *expect* to receive above the risk-free rate. It is therefore an *ex ante* measure, and this is where the difficulty arises. Much time and effort has been expended analysing *ex post* historical series dating back as far as 1919, but, as we are regularly warned, past performance of shares is not necessarily a guide to the future. There has also been much discussion of such issues as the appropriate time period, survivorship bias and the virtues of arithmetic versus geometric averaging.[8] The result is that the empirical estimates offer a wide range of outcomes, depending on the preferred assumptions. Thus, the MMC in its 1993 British Gas report tried to cut through the elaborate tissue of modelling and estimation and instead asked leading investors what rate of return they expected to earn on investment in a utility share like that of British Gas. Although the sample was small, the respondents included major shareholders in British Gas, and they were influential in the MMC's final determination in this case which, as Appendix 1 shows, has been followed fairly consistently in subsequent cases. Unfortunately, it is unlikely that the exercise could be repeated, because fund managers might now believe that a high estimate of the required rate of return could improve the actual return on their investment.

However, the validity of the MMC's estimate of the cost of capital does seem to have been confirmed, or at least not contradicted, by the response of the stock market to its recommendations. Typically, the immediate reaction of the stock market to the publication of MMC reports has not been negative. Admittedly, there are many elements in such reports (such as the measurement of the RAB) which affect prospective returns, but it would surely be expected that the recommendation by the MMC of a return substantially below the acceptable level on the utility's current assets and future investment, would lead to an immediate fall in share price (unless the market had anticipated an unacceptable recommendation, in which case the fall in share price would occur earlier). Certainly, the handsome premia paid in recent electricity and water take-overs do not suggest that a prospective 7 per cent real rate of return is seen as a threat.

Thus, the range of rates of return set in the 1993 British Gas report seems to have stood the test of time. It must, however, be admitted that it should be regarded as a robust rule of thumb rather than a precise measure. This arises not only from the uncertainty arising from estimating the elements of the CAPM, but also from the treatment of taxation. It is not clear from a theoretical standpoint that it is sensible to try to define a consistent *pre-tax* rate of return, where the tax referred to is corporation tax, yet the rate-of-return calculations made by regulators are usually on a precorporation tax basis. Shareholders presumably require a consistent post-corporation tax return, because it is that which determines their dividends. Some water companies have indeed been tax-exhausted, as a result of investment programmes, so that their pre- and post-corporation

[8]See, for example, Scott (1992) and Jenkinson (1993). A recent British contribution to the empirical literature on the equity premium is O'Hanlon and Steele (1997): it estimates a premium in the range 4 to 5 per cent. This is lower than estimates obtained by traditional methods which gave rise to the so-called 'equity premium puzzle' (surveyed by Kocherlakota, 1996).

tax returns have been identical, although they may still be allowed to make notional tax charges for accounting purposes.[9] In such circumstances, allowing a pre-tax rate of return which matches a cost of capital grossed up for notional corporation tax might seem to be unduly generous to the company.

A disputable assumption commonly made in grossing up the cost of capital for corporation tax, is that the whole equity stream attracts imputation relief. In fact, only the proportion distributed as dividends receives imputation relief, and retentions do not, so that assuming full imputation relief reduces the grossing up factor and therefore the pre-tax cost of equity capital. The 'full distribution' assumption might be justified on the ground that ultimately all equity returns are distributed and should be valued as if they currently attract imputation relief. However, it is surprising that regulated companies have not disputed this assumption more strongly in the past, because it reduces the pre-tax rate of return which the regulator allows. In the future, the expected withdrawal of imputation relief will remove this particular problem, but another effect of this will be to increase the grossing up factor and, with it, the importance of establishing a proper treatment of taxation.

Concluding Thoughts

The RAB and the RRR raise quite complex and absorbing technical issues which may distract attention from the main point, that they provide useful rules of thumb but not a precise determination of what price cap should be set. For the latter purpose, they need to be combined with other information available to the regulator.

One important aspect of this process is the *time period* over which the regulator drives the expected rate of return down to the minimum level. This determines the period over which the regulatee is allowed to benefit from any excess rate of return which occurs. In so far as such a return results from innovation and cost saving by the regulatee, it is desirable that it be continued long enough to provide an appropriate incentive for further improvements. It has been argued that eliminating excess returns at the beginning of each regulatory period provides little incentive to improved performance in the later part of the previous period. Insofar as excess returns are due to the positive efforts of the regulatee, it is important that they be phased out over a long enough period to provide adequate incentives. On the other hand, insofar as excess returns are the result of mis-judgement by the regulator, unduly pessimistic cost or demand projections by the regulatee, or merely strokes of good fortune outside the control of either, there is no reason to adopt a 'soft landing' approach in adjusting future returns to more normal levels. Recent MMC reports, notably those on South West Water and Portsmouth Water, have adopted a fairly sceptical view as to the need for excess returns to persist and have therefore preferred a relatively rapid adjustment (for example, in the water cases, the adjustment proposed by

[9] The current UK Accounting Standard, SSAP15, allows provision only when crystallisation of the liability can be foreseen. This standard is currently under revision, and the UK may follow international practice which requires full provision for all notional tax charges. However, this does not reflect the real economic benefits of deferral of the tax payment.

the MMC was over the following 5-year period, whereas the Regulator had previously adopted a 10-year adjustment). Recent pronouncements by the regulators, notably OFGAS and OFWAT, have expressed similar views. However, this is an area in which the circumstances of the case, interpreted by the regulator's judgement, should determine the outcome. Precise rules would inevitably be arbitrary.

A second important aspect of the process of setting the price cap is *cash flow* forecasting. This was emphasised by Michael Beesley in his 1995 lecture in this series, which dealt with setting the price cap for British Gas. This provided considerable insight into the thinking behind the 1993 MMC report on British Gas, but it has more general application to the regulatory process. Budgets are a crucial element in the process, because the prospective revenue generated by the price cap must be adequate to meet the prospective expenses. The difference between the two, the profit or loss, is a relatively small item and depends upon the accurate determination of the larger items. One of the areas of contention and possible error in determining the larger items is the accountant's estimate of accrued amounts and changes in them, the obvious examples being asset valuation and depreciation. A *cash* budget avoids this problem by cutting out the accruals: there are therefore no problems of revaluing assets or assessing depreciation. The cash flows of the business thus give an alternative insight into the underlying transactions which are of help to the regulator. A cash-flow alternative to the RRR/RAB approach asks the question: Are the prospective cash inflows of the business adequate to meet the necessary cash outflows? The outflows will include operating expenses, replacement investment, and interest and dividend payments necessary to reward existing investors in the firm and any new investment which is required.

Although cash-flow projections can provide the regulator with a very useful cross-check on more traditional accrual accounting methods of the RRR/RAB variety, they are not a substitute for these and are not complete in themselves. There are two crucial gaps in the description of cash-flow regulation given above. First, the costs of financing which are allowed must relate to the capital sum which they are servicing, that is, to something resembling the RAB. Second, cash-flow projections over a fixed regulatory period of, say, five years are not sufficient to establish whether shareholders have been given a reasonable reward in terms of dividends: the value of dividends, and therefore of other cash flows, beyond the regulatory horizon is also relevant. This is captured by the terminal value of the RAB, at the end of the regulatory period. This is the amount upon which the regulator intends to base future returns, and is therefore one useful estimate of the value of investors' capital at that time. As the experience and skill of the regulator improve, the period over which cash flows can be reliably forecast may lengthen, and the importance of the terminal value of the RAB will diminish, but it will not disappear.

Thus, we cannot entirely escape the use of the RRR and the RAB. What we should do is to recognise that they are only two elements in a larger set of information which is used in the regulatory process. Moreover, their use involves a degree of subjective judgement by the regulator and is not as precise as is hoped for by those who press for clarification of the 'regulatory contract'. This imprecision is not necessarily a bad thing. The regulatory process is, after all, intended to act as a substitute for the discipline of the market-place, and few markets signal their future behaviour very precisely in advance. Regulated firms do expect to receive an equity premium in their shareholders' returns and this can be justified only if they are subject to a degree of risk and uncertainty.

The clarification of the 'regulatory contract' may also be undesirable from another perspective—that of change. The regulatory process is not static. Regulators have accumulated considerable experience and insight during the past decade or so, and it is reasonable to expect that this process will continue. As a consequence, the precise form of regulation may change, and it would be unfortunate if progress in this direction were inhibited by an unduly legalistic and static view of the nature of the regulatory contract.

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Appendix 1: Some recent MMC decisions on the RAB and the RRR

Report	Initial RAB	Price change adjustment	Depreciation	RRR
British Gas (1993)	Stock market value in 1991 (MAR 0.6).	Current Cost	Current cost charged to revenue, but abated by MAR before deduction from RAB.	6.5 to 7.5 per cent, real, pre-tax.
British Gas (1997)	As in 1993, plus additional investment and price changes, less depreciation, as agreed in 1993.	RPI	Based on RAB for old assets and cost for new assets. Amount charged to revenue is deducted from RAB.	7 per cent, real, pre-tax.
South West Water (1995) and Portsmouth Water (1995)	Market value for over 200 days following flotation (SWW), 50 per cent of indicative value (Portsmouth).	RPI	Current cost charged to revenue and deducted from RAB.	6 to 8 per cent, real, pre-tax.
Scottish Hydro-Electric (1995)	CC Value in 1991, less depreciation, plus new investment.	RPI	Based on RAB, charged to revenue and deducted from RAB.	7 per cent, real, pre-tax (range 6 to 7.75 per cent).
BAA, London Airports (1996)	Book value (replacement cost) in 1991, plus subsequent investment, less depreciation.	RPI	Accounting depreciation (modified HCA) charged to revenue and deducted from RAB.	6.4 to 8.3 per cent, real, pre-tax.
Northern Ireland Electricity (1997)	Initial flotation value, plus subsequent investment, less depreciation.	RPI	Current cost abated by MAR for initial assets, and full depreciation on new investment charged to revenue and deducted from RAB.	7 per cent, real, pre-tax.

Appendix 2

Illustration	
Assume that Current Cost net asset value is	£500m
Market-based initial value (RAB) is	£200m
MAR is therefore	£200m/£500m= 0.4

Depreciation rate d is 5 per cent p.a. straight line

Assume no price adjustments or new investment.

(1) If **depreciation is based on RAB,** the charge D against regulated income should be

£200m×0.05=£10m.

Alternatively, we can characterise this in CC terms as

CC×d×MAR, ie £500m×0.05×0.4.

The **closing RAB** should be reduced by D to reflect the **return of capital** which it represents,

i.e. closing RAB is £200m−£10m=£190m.

This is the amount upon which future allowable rates of return will be calculated. The future cash flows (from D and profit), discounted at the regulatory rate of return, have a present value equal to the initial RAB, i.e. net present value is zero and there are no excess profits. This is because the sum of depreciation is equal to RAB and the profits exactly offset the discount factors (the rate of return being the discount rate).

The **closing CC** valuation should be reduced not by D but by the amount before MAR abatement, i.e. by £500m×0.05=£25m., so that the closing CC valuation is £500m−£25m=£475m.

But the CC valuation has no direct relevance to regulatory profits or charges.

(2) **If depreciation is based on CC** without abatement for the MAR, it is essential that the resulting higher return of capital be reflected in the closing RAB, which is the basis for calculating future allowable returns on capital.

Under this régime, D=CC×d=£25m.

But the **full amount** of D is deducted from RAB, so that closing RAB is

£200m−£25m=£175m.

Thus, CC provides a basis for allowing higher depreciation against income, but this is reflected in a more rapid reduction in the RAB and consequently lower future allowable profits. The present value of the future earnings streams, discounted at the regulatory rate of return, should be the same under (2) as under (1) i.e. equal to initial RAB.

If there is no new investment, the RAB will be completely written off after 8 years (8×£25m−£200m). After that, no further depreciation should be allowed against profit and no further rate of return will be allowed (because RAB is zero). Otherwise, provision would have to be made for a negative return based on a negative RAB and ultimately for refund of the negative RAB.

(3) **If depreciation is based on CC as an income charge but on RAB as a capital adjustment,** as in 1993 MMC report, the result is a generous charge against regulatory income, constituting a return of capital, which is not fully reflected in the capital base.

Under this regime, D would be £25m as in (2) but the closing RAB would be £190m as in (1). Thus, future allowable returns would be higher than in (1) because the charge D against regulatory income would be higher, and higher than in (2) because the closing regulatory base, RAB would be higher. The present value of the future cash flows implied by (3) is therefore higher than that implied by (1) and (2) (which would be exactly equal to initial RAB). (3) therefore awards excessive returns to shareholders (the present value of future cash flows, discounted at the regulatory rate of return, exceeds the initial RAB, so that net present value is positive).

Further illustrations of alternative depreciation schemes and their effects on the MAR and the RAB will be found in Whittington (1994).

CHAIRMAN'S COMMENTS

Ian Byatt

IT IS A GREAT PLEASURE FOR ME TO BE CHAIRING THIS SESSION because this is in my old stomping ground when I worked in the Treasury. I am interested that Geoffrey uses the words RRR in the paper, if not in the slides. The RRR was, of course, something we invented in 1978 in relation to the Nationalised Industries. It is also a great pleasure to have Graham Houston here tonight because he is the person who taught me how most of these things should work.

What you said is music to my ears. As I see it, you are drawing attention to a number of sound theoretical propositions: current cost accounting should be done on the basis of the maintenance of financial capital, and one should think about the investment *in* the industry and not the investment of the industry. From these, a large number of things fall into place, in particular the articulation of the profit and loss account and the balance sheet including the regulatory asset base. I wish that practice was as well advanced as the theory of the matter. I think you are absolutely right that once depreciation is accounted for in the right way, many of the problems concerning it fall away.

I also agree with you that the return on capital is essentially a forward-looking concept. Though unknowable (at least to human beings), we have to make various estimates of it. I was also interested in what you said about cash. I am not quite sure whether the reference was to theory or practice. As I understood it, you were saying cash does not quite deal with all the intergenerational points that can be made. If that is true, it also applies to some of the things that you said about depreciation. I think that you were suggesting that the rate of depreciation did not really matter. I do see the enormous difficulties in estimating the right rate of depreciation, but on the other hand you will have quite significant differences between consumers at different points of time unless depreciation is handled correctly.

The importance of getting a correct estimation of net returns over time is illustrated by events in the early days of the privatised water industry. Then people talked about getting a rate of return which in effect advanced the return on capital very considerably. That was pretty unpopular and I think with very good reason. I used to describe it as 'advancement' but I was admonished for putting it in that way. I remain pretty unrepentant. In our next price review we are proposing to establish what we call 'broad equivalence'. Is the expenditure on capital maintenance broadly equal to depreciation? Over what period of time should broad equivalence apply? That is as much a judgement about generations, a political or social judgement, as it is a technical judgement.

On the return on capital, I should confess that at the last price review we also asked the kind of people to whom you referred about their expectations of the returns on their financial investments. We got much the same answer as you got. This implied that what had gone on in the past about estimating the return on equity by adding a historical equity premium to a forward-looking return on debt was, in a sense, crazy. This becomes quite clear when you ask the very simple questions, does anybody expect a return on equity in

the future which is equal to the current redemption yield on gilts plus what the capital asset pricing model said the equity premium had been in the past? Some very odd theoretical things were going on there. I believe we have cracked those now. There is a broad consensus that the equity premium is around 3–4 per cent or possibly lower.

You talked about incentives. A particular one was the question of remuneration for actual investment or that allowed for in setting price limits. In 1993 OFWAT published a paper which I think was largely your position 3, but last summer we published a paper which suggests moving towards your position 2. So we got less rather than more trusting! In February we will set out our firm proposals for the 1999 Price Review. I would be reluctant to move to 1. This seems to me clearly to be retrospective and undesirable. You also raised the question of 'do you have a glide path', in other words a slow phasing out of whatever excess profits there may be in the system? There were excess profits in 1994, arising out of the use of the regulatory capital base that you talked about, rather than the initial value. At least one person in this room regarded this decision as confiscation of shareholders' money. But any such 'confiscation' did not take place abruptly.

As well as the question of specific incentives, there is the question of the credibility of the regime. RPI-x is highly desirable in that it has very strong incentives to greater efficiency. On the other hand, the general public has still to be persuaded it works, in the sense that efficiency gains eventually finish up in the pockets of customers rather than in the pockets of shareholders and others. For those reasons, in addition to the points you were making, there are strong arguments for a fairly rapid and visible transfer of efficiency gains to customers. Hence my proposal of a P0 adjustment at the next Price Review.

I entirely agree with you about the need for discretion. How can you have a regulatory contract which is set in concrete for five years ahead? God has not told us how to predict the future. Most human predictions turn out to be pretty poor over a five-year period. Setting a framework within which people can act sensibly must involve quite a lot of judgement. Then the question is how do you check and test that judgement? I think that the only answer is a reasonable amount of transparency. The test that should be applied to regulators is: Are they explaining what they are trying to do as well as they should, and are they being fully open to challenge on these matters?

Section V
Regulation of accounting and auditing

Accounting Standard Setting in the UK after 20 Years: A Critique of the Dearing and Solomons Reports

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Introduction

The Accounting Standards Steering Committee (ASSC) came into being on 1st January 1970. This was preceded by a series of controversial events in 1968 and 1969, including the GEC-AEI and Pergamon-Leasco take-overs, which had shaken public confidence in financial accounting, culminating in the public controversy, in the columns of *The Times*, between Prof. Eddie Stamp (then of Edinburgh University) and Sir Ronald Leach (then President of the Institute of Chartered Accountants in England and Wales, ICAEW). It was the ICAEW Council which took the initiative in creating the ASSC.

The ASSC was a self-regulatory private sector body, sponsored by the (then) three Chartered Institutes (the Irish and Scottish Institutes becoming members in 1970), dominated by accountants in public practice, and relying for its authority on its disciplinary powers over individual members of its constituent bodies who were preparers or users of accounts. The ASSC became the Accounting Standards Committee (ASC) in 1975; and in 1971 and 1976 other professional bodies were brought in, so that the Consultative Committee of Accountancy Bodies (CCAB) which controls ASC is now sponsored by all six of the leading accountancy bodies, the newcomers being the Certified Accountants (1971), the Management Accountants (1971), and the Public Sector accountants (1976) (all three bodies have obtained Royal Charters during the period, so that there are now six chartered bodies). There have been periodic reviews of ASC's work, notably the Watts Report (1981), which resulted in a widening of membership in order to relax the apparent grip of the auditing profession on the standard-setting process. However, the basic structure of a self-regulating professional body, constituted of part-time volunteer members, has survived; and in twenty years it has issued twentyfour substantial accounting standards, which are, for the most part, adhered to by users and preparers of accounts. At first blush, this might seem to be a story of unalloyed success: the emergence of a new national institution.

However, all is not well with the ASC. The current volume of Accounting Standards published by the ASC does contain a large number of extant standards, but the largest item in the book is the Handbook on Accounting for Changing Prices, which, whatever its merits, is a confession of failure. The debate on accounting for changing prices

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absorbed the larger share of ASC's energies from the publication of the first exposure draft (ED8) in 1973 to that of the standard on the subject (SSAP16) in 1980. The subsequent withdrawal of SSAP16, following substantial non-compliance, and the publication of the Handbook (1986) resulted in a serious loss of confidence by and in ASC. This must raise doubts as to ASC's ability to deal adequately with such pressing matters as off-balance sheet financing, which it has addressed in ED42 but which has yet to be developed into a standard. Moreover, on a number of other issues, ASC has either failed to act or has seemed to be very anxious to avoid controversy by accommodating the needs of pressure groups.

ASC's central problem is lack of authority, and some would add to that a lack of direction. The Dearing Report, published late in 1988, addresses the issue of authority and proposes a new structure for accounting standard setting. The Solomons Report, published early in 1989, attempts to deal with the problem of direction by proposing guidelines for reporting standards, or what is popularly known as a conceptual framework. Both reports have appeared at a time when the pressures on ASC are such that change is almost inevitable. It is therefore important to consider not only whether the reports are soundly based on reason and evidence but also whether they point the appropriate direction for practical developments.

The background: problems, pressures and overseas experience

Problems

The main problems of ASC were characterised above as lack of authority and lack of direction, i.e. the enforcement of standards is weak and the content of standards is also deficient.

The enforcement problem arises from the fact that ASC is a private sector self-regulatory body, backed merely by professional discipline. Moreover, since accounts are prepared by directors, who may not necessarily be accountants, the discipline may not apply at all: the auditor, who will (with rare exceptions) be a member of a CCAB body, is merely required to report a departure from accounting standards (and then only if the departure is not deemed to be justified by, for example, the over-riding need to present a true and fair view), not to correct the departure.

In an attempt to buttress its authority and enforce a new standard on price change accounting, the ASC sought a legal opinion (the HoffmanArden opinon, 1983) as to whether its standards might have some authority under the Companies Act as evidence of the generally accepted accounting principles which give rise to the true and fair view required by the Act. The Hoffman-Arden opinion was that ASC standards could serve such a role, but not if they expressed views which were manifestly not generally accepted. Thus, the ASC cannot claim the authority of generally accepted accounting principles if it attempts to lead current accounting practice rather than following it, e.g. it could not claim that price change accounting was 'generally accepted' when only a small minority of companies was actually using it.

With regard to the content of standards, a widespread criticism is that the ASC has, because of its weak enforcement powers, had to take a consensus view and has frequently

changed its mind or made concessions to placate pressure groups. Examples of such cases have occurred in relation to the treatment of research and development expenditure, deferred taxation and investment properties. More fundamentally, ASC has tended to lack a consistent set of central concepts which would lend coherence and consistency to the set of standards as a whole. An obvious example of this problem is the issue of valuation, which emerges from accounting standards with a wide variety of recommended methods (Solomons Report, p. 36). The solution to this problem might be a conceptual framework, of the type recommended by the Solomons Report, if such a framework could be agreed upon and if it were robust enough to deal adequately and consistently with the wide range of problems addressed by accounting standards.

A related dimension of the problem of content, which would have to be addressed by a conceptual framework, is the issue of whether standards should enunciate general principles designed to achieve a true and fair view or should attempt detailed prescription. In the terms used by lawyers, this is the issue of substance over form. British accountants tend to prefer general principles rather than detailed prescriptions, i.e. they prefer to aim to report economic substance rather than legal form. Not surprisingly, lawyers tend to prefer legal form (e.g. see the debate between Tweedie and Kellas (1987) and Aldwinkle (1987)). Economic substance puts great stress on the professional judgement of the accountant and auditor and could be open to abuse or unpredictability due to its high degree of subjectivity. Legal form, on the other hand, lends itself to 'loopholing' and may obstruct the communication of relevant information.

Pressures

Most of the above problems have been with the ASC throughout its existence and are, to some extent, likely to be endemic in any private-sector standard-setting body. They have become particularly acute in ASC because of current pressures. Four sources of pressure will be considered: securities markets, the structure of the accounting profession, international developments, and public demand.

Securities markets have become extremely active and competitive in recent years, following the 'Big Bang' in the London Stock Exchange, the increasing internationalisation of securities markets (following the relaxation of exchange controls and improvements in the technology of communication) and the very active market in corporate control (i.e. mergers and take-overs) in the UK. This has increased the incentives for company directors to show their performance in the most favourable light in their accounts, both to defend their company against possible takeovers and to enable their company to take over others on the most favourable terms. This is currently apparent in the controversy over accounting for brand names. Moreover, there has been rapid innovation in the creation of new securities and methods of financing (e.g. deep discount bonds and off-balance sheet financing). These have no doubt improved the financial opportunities available to companies, but they have also created accounting problems, partly because non-traditional transactions simply do not fit in well with traditional accounting practices, but also because the new techniques have sometimes been used deliberately to provide cosmetic improvements to the firm's accounting performance, i.e. the general phenomenon of 'creative accounting' (Griffiths, 1986).

The structure of the accounting profession, or, more strictly, the structure of auditing firms, has also changed in a way which puts strains on accounting standards. The larger auditing firms (which tend to have the strongest presence on professional committees and the ASC) have grown very large indeed, with literally hundreds of partners. Auditing has become large-scale team work. Such an environment is far removed from the traditional idea of the individual professional auditor, exercising personal professional judgement and skill in order to arrive at a true and fair view. The larger scale environment requires rule books, to co-ordinate the large number of individuals involved in the team, and leading firms have devised their own large and comprehensive audit manuals, setting out their standard procedures in detail. Such manuals are most easy to prepare and maintain when they operate within a prescriptive accounting standards regime, which provides a set of specific rules rather than broad principles.

However, there is more than sheer size to consider. Auditing has become a very competitive activity, with tendering common and changes of auditors more frequent. Moreover, the leading firms are more diversified, auditing being regarded as a mature market and consultancy and advice being the expanding and profitable activities. Thus, there is pressure to please directors (often mistakenly referred to as clients, whereas it is the shareholders who elect the auditors) in order to avoid losing audits. If the auditor is to resist the directors and qualify the accounts, a specific rule book may provide a better prop than a vague injunction to provide a true and fair view. Moreover, the increasing threat of large negligence suits also creates a demand for specific rules which can provide a possible defence against negligence charges.

There have been important international pressures on accounting standard setting in recent years. Most obviously, the European Community (EC) directives have sought to improve the uniformity of accounting and auditing practice in the EC. Continental European accounting is generally more prescriptive and legalistic than that of the UK, so that its influence also is generally in the direction of more specific rule books (e.g. the company account formats introduced in the 1981 Companies Act). Another source of international influence is the increasing internationalisation of business, which has led to pressure for UK accounts to conform with those of other countries, both to reduce preparation costs and to facilitate their use in overseas financial markets. The pressure to conform with US practice is particularly strong, both because of the importance of the US economy and because the Financial Accounting Standards Board (FASB) and Securities and Exchange Commission (SEC) have tended to be international leaders in accounting standard setting. The International Accounting Standards Committee (IASC) was originally a somewhat passive body which issued rather permissive standards, but it has recently started to be more pro-active, proposing to restrict the range of practices which it endorses. Since the lASC's standards are apparently strongly influenced by those of the USA, it seems likely that the IASC will increasingly become a vehicle for encouraging UK standards to become more in line with those of the USA.

The final source of pressure on ASC, public demand, is more nebulous but none the less real. For example, the adverse publicity attracted to the profession by the public accounting controversies of 1969 was influential in setting up the ASSC (Leach, 1981). More recently, Ian Griffiths' book *Creative Accounting* (1986) has been a best seller, and this must have provided some of the impetus behind ED42 (although the pressure has not yet been sufficient to force the development of a standard on the subject). The threat

behind adverse publicity and public disapproval is, of course, that the government will intervene, as it has done recently in the securities markets through the Securities and Investments Board (SIB). In this context it is ironic to recall what Martin Gibbs (a stockbroker) wrote about the threat of government intervention, on the tenth anniversary of the ASC:

> We must continue the search for an effective voluntary system of control. The price of failure is likely to be the establishment of a government agency which would not only monitor the accounts of public companies but eventually extend its tentacles into the control of all aspects of the securities industry. (Gibbs, 1981)

Overseas Experience

In view of the increasing internationalisation of accounting, it is important to consider what has happened elsewhere in the world, because it is unlikely that the UK (together with Ireland, which is also a partner in the ASC's work) will be able to pursue a completely independent course. However, even if this were not the case, it would be highly relevant to observe overseas experience as evidence of alternative possible scenarios for accounting standard setting.

One clear message emerges from overseas experience: financial accounting everywhere is subject to some form of regulation whether by statute or by private sector bodies. Thus, there is no extant example of the Chicago/Rochester ideal (e.g. Benston, 1981) of a regulation-free world in which accounting is regulated only by independent contracting between users and preparers. This suggests that there is a widespread demand for regulation, although there is no reason to suppose that any particular regulatory system currently in force is ideally suited to its purpose.

The other important message from international experience is that there is a variety of methods of standard setting currently in place, and the choice of methods seems to be contingent upon the economic, legal and political environment of the country concerned.

At the risk of being simplistic, it is possible to draw a distinction between the English-speaking world and the continental European tradition. In the former (the UK, USA, Australia, Canada, New Zealand and South Africa), there is a strong tradition of private-sector standard setting, albeit often (although not in the UK) with statutory backing, as in the SEC oversight of the FASB in the USA. This system is associated with active stock markets and emphasis on reporting relevant information to equity investors. The continental European tradition, on the other hand, emphasises the legalistic approach, the contents of accounts being prescribed by national accounting plans, company law or tax law. This system is prevalent amongst leading members of the EC, notably Germany and France (but not the Netherlands) and is also found in South America. It tends to be associated with economies which lay less stress on the stock market in financing and controlling companies. Thus, it can be hypothesised that private sector standard setting is associated with meeting shareholders' informational needs in an active capital market. Possibly this form of standard setting is seen as being more flexible and adaptable than the statutory approach.

The Dearing Report

The Dearing Committee was appointed in November 1987 by the CCAB, the parent body of ASC, 'to review and make recommendations on the standard-setting process' (Dearing Report, p. 1) within specific terms of reference. It had sixteen members (including the current Chairman of ASC), drawn from a wide variety of relevant backgrounds (only four were accountants in public practice) plus a government observer and a secretary from the Bank of England. It received 45 written submissions and had informal discussions with interested parties (including visits to the USA). It reported in September 1988 (the date of the Foreword). The Report is thin and so, for the most part, is its evidence and the reasoning which it offers, but its proposals are carefully thought out and potentially momentous.

The main proposals for a new standard-setting structure are as follows:

(1) The current system whereby CCAB supervises the ASC should be replaced by one in which a new Financial Reporting Council (FRC) supervises a new Accounting Standards Board (ASB).
(2) The FRC would be independent of the accounting profession. The Chairman would be appointed jointly by the Governor of the Bank of England and the Secretary of State for Trade and Industry. The other members (20 in all) would be nominated by a wide range of interested groups (including accounting professional bodies). They would be senior people and the Council would meet rarely. It would set priorities for and oversee the work of the ASB.
(3) The ASB would consist of nine members, including a full-time Chairman and Technical Director, the remaining seven members being part-time but paid. They would be the core of the new standard-setting process, and would be supported by a larger technical secretariat than is the present ASC. It would issue standards on its own authority.
(4) The ASB should establish an Emerging Issues capability to provide prompt authoritative guidance on new problems.
(5) There should be a Review Panel 'to examine contentious departures from accounting standards by large companies' (p. 44). This should be modelled on the Panel on Takeovers and Mergers, with a pool of experienced part-time members and a Chairman who might be a QC.
(6) Legal backing for the process would be derived from three sources, which would involve new legislation:

    (i) Directors would be required to report on any deviations of their accounts from current standards.
    (ii) The current criminal offence which can (but rarely does) lead to prosecution of directors when the accounts do not give a true and fair view should be replaced by a new civil law statutory power, under which the courts can order the revision of accounts, following an application by the Secretary of State for Trade and Industry, the Review Panel or the Stock Exchange.
    (iii) There should be a general presumption in legal proceedings that accounting standards have the support of the courts, i.e. those who depart from accounting

standards should bear the burden of proving that the departure was necessary in order to give a true and fair view.

(7) The cost of the new standard-setting system would be financed partly by a small levy (£1 is suggested) on the filing of company annual returns, by charging for the use of standards (which would be copyright) and publications, and by contributions from the Stock Exchange (from listing fees) and other private and public sector bodies which would benefit from the system. The contribution from the accounting profession, which currently supports the CCAB, would continue, but its dilution by contributions from other sources would mean that the new system was much less dependent on the accounting profession than is the present one.

Evaluation of the Dearing Proposals

The main thrust of the Dearing Report is to propose a new administrative structure for accounting standard setting. This has three broad features. Firstly, it is intended that the ASB would be quicker and more decisive than the present ASC in producing standards, by virtue of the ASB's smaller size, ability to issue standards on its own authority, greater time commitment by members and greater technical support. Secondly, it is intended that ASB should be substantially more independent of the accounting profession than is the ASC (an offshoot of the CCAB). Thus, Dearing is proposing a move away from selfregulation by the accounting profession towards wider private-sector regulation, with a broad range of constituencies represented, and the government influence stronger (e.g. in the appointment of the Chairman of the FRC). Thirdly, the proposed system would have explicit legal backing, devised in such a manner as to overcome the ASC's present lack of authority whilst maintaining the ability of the ASB to set standards without the cumbersome process of detailed legislation.

In all of these respects, the Dearing Committee's recommendations are practical and sensible. It is possible to argue about details, e.g. the Department of Trade and Industry has questioned the amount of the levy on company annual returns, and the CCAB has suggested that only the Secretary of State should be responsible for (and bear the cost of) applying to the courts for an order to issue revised accounts. It is also possible to question whether the proposals go far enough (e.g. will the proposed distancing from the CCAB remove standard setting too far from the accounting profession, the one group which has shown a willingness to give practical support to the standard-setting process? The initial negative reaction of the Stock Exchange to the Dearing proposals is not a good omen). However, it seems likely that the Dearing proposals at least represent a step in the right direction. Their effectiveness is likely to depend upon the way in which they are carried out, the commitment and ability of those involved in the new bodies and the attitudes of their constituencies. A simple practical evaluation of the Dearing Report is that it is worth trying out and probably offers as good prospects as any alterna tive, if it is believed that accounting standards are necessary and that they should be set in the private sector

That is not to say that the Dearing Report should be greeted with unqualified enthusiasm. The weakness of the Report is in its lack of evidence and lack of serious reasoning in support of its proposals. It is essentially a statement of the beliefs of a committee of 'the great and the good', relying on the *ex cathedra* authority of its eminent membership. Of course, those members have considerable experience and may well have

pondered a great deal on the problems of standard setting, so that the Report, which is essentially a statement of conclusions, may be backed by more empirical evidence and analytical thought than is apparent from the text. Moreover, since the conclusions are essentially practical, the proof of the pudding will be in the eating, and *a priori* theorising or evidence of past events are not necessary preconditions for future practical success. Nevertheless, it would be reassuring to have more convincing evidence than the Committee chose to present, not least because the proposed new standard-setting structure would need a sense of direction and frame of reference, which it will not obtain from the Dearing Report. Whether the Solomons Report can fill this vacuum is an issue to be addressed later.

An obvious example of the Dearing Committee's thin empirical evidence is its statement that there is 'little evidence that; companies are engaging in flagrant breaches of accounting standards' (p. 12). This is used to support the gradualist approach of the Committee, tightening up compliance in line with the best current international practice, but avoiding the possible inference that the ASC currently faces a crisis. In fact, the debate over price change accounting, resulting in the withdrawal of SSAP16 with no replacement, was most certainly a case of actual or threatened 'flagrant breaches of accounting standards', since non-compliance was the main motivation for ASC's retreat from the area. Equally, ASC, by its consensus nature, is bound to consider possible non-compliance before it issues a standard, so that the content of current standards (and the subjects on which standards have not yet been issued) reflects partially the threat of 'flagrant breaches'.

Theoretical argument is almost entirely lacking in the Dearing Report, pragmatism and expressions of opinion being the order of the day. This approach is at its weakest when the content of standards is considered: after all, the new structure will only be as successful as the standards which it issues, so we might hope for some view as to the content of these standards and how this relates to the Committee's view of their purpose. The Committee enjoins the new ASB to aim for 'quality and timeliness' and 'quality rather then quantity' (p. 18), but this is a somewhat empty injunction to pursue virtue, so long as 'quality' is not defined. Equally, the new standards are to reduce choice of method but at the same time accommodate the true and fair view. The conceptual framework is seen as something which would be desirable if it were feasible (although the reasons are not very clear: one of them seems to be that the Americans have one, so that the UK should follow) but is probably difficult to agree upon (hence, surely, are standards), so that it should be considered, but not pursued too hard.

This leaves a considerable vacuum, not only with respect to the aims and content of accounting standards, a subject which the Solomons Report addresses, but also with respect to the underlying rationale of the standard-setting process.

Some Questions Which Dearing Does Not Address

The following questions are fundamental to the standard-setting process. The Dearing Report does not set out to answer them in a systematic way, although inevitably its somewhat pragmatic proposals provide implicit answers to them:

(1) Why do we need regulation of accounting?
(2) Why should such regulation be carried out in the private rather than the public sector?

(3) Within the private sector, what is the case for self-regulation by the accounting profession?
(4) Why is enforcement necessary and, therefore, what form should it take?
(5) What form should standards take: 'true and fair' statements of general principle or legalistic detailed prescription?

Clearly, the answers to these questions are interdependent, if we are to develop a coherent view of the standard-setting process. With regard to the fundamental question (1), the Committee's answer is the pragmatic one, that every other country seems to need standards. It would, however, be helpful to have a view as to the reasons for this and cation as to what failures in the market for ac- their particular relevance to the UK, i.e. an indicounting information justify regulation, contrary to the Chicago/Rochester view which assumes that the market is best suited to sorting out the costs and benefits of supplying information. One factor which might be important is the absence of a market capable of reconciling the needs of diverse shareholders and other users to provide a single, comparable, cost-effective information package (as suggested in the Solomons Report, p. 6). The Committee's answer to question (2) appears to be that standards should be set in the private sector. Presumably this has something to do with the greater flexibility of the private sector, although the Report does not make this clear. If this is the justification for private-sector standard setting, and if we accept the problem of diverse needs as being fundamental, then the body concerned should be capable of taking account of the needs and balancing the interests of all the parties concerned, which might suggest that self-reglation by accountants was too narrow (an answer to question (3)). On the other hand, it is important to guard against regulatory capture by interest groups. Dearing's proposed balance between the FRC (with its wide representation) and the ASB (technically proficient and independent but more narrow in membership) might be justified as an attempt to deal with these problems. Unfortunately, however, explicit reasoning of this type is absent from the Dearing Report and, as a result, its proposals are less convincing than they might be.

However, if we accept the pragmatic nature of the Report, the proposals individually do seem to provide a sensible and practical response to the pressures described earlier. There can be little doubt that similar pressures are leading to greater regulation in other countries and in other related markets in the UK, notably securities markets under the SIB's supervision. It is one of the ironies of the liberalisation of markets, such as has been attempted recently in the UK, that it often requires greater regulatory infrastructure (e.g. not only the SIB but also the regulatory agencies for privatised industries): the USA, for example, has historically had a much more market-oriented economy than that of the UK but has had much more formal regulation of the markets (notably by the SEC but also by many other state and federal agencies). The liberalising of markets within the EC also shows every sign of increasing public sector regulation. Thus, the Dearing proposals seem appropriate in the current historical and institutional context: bringing accounting standards out of the province of the accounting profession into a broader-based private-sector partnership which includes government representation and legal backing.

The Solomons Report

The Dearing Report's ambivalence as to the appropriate form and content of accounting standards leads naturally to a consideration of the Solomons Report, *Guidelines for Financial Reporting Standards*. This was sponsored and published by the Research Board of ICAEW 'and addressed to the Accounting Standards Committee'. It therefore has less official status than the Dearing Report, and it is the work of one individual, Prof. Solomons, rather than a committee. It does, however, have some similarities in conception with the Dearing Report. Both reports were prepared in a relatively short time, both are designed to provide a framework for action to improve accounting standards (Dearing being concerned with the process of standard setting and Solomons with the content of the standards), and consequently both have a somewhat condensed style, with limited scope for discussing reasons and alternatives. Solomons is, not surprisingly, the better at spelling out his reasons, and many are elaborated in his well known book (Solomons, 1986). Nonetheless, there is a great deal of controversial material in his guidelines with which others might disagree, and there are points where his judgement has to be taken on trust, especially by those who have not read his other work or the wider academic literature to which it relates.

The Main Solomons Recommendations

The Solomons Report starts from the assumption (Chapter 1, p. 6), that comparability is the central motivation for the -regulation of accounting: 'Good accounting standards make *like* things look alike'. Closely related to this is the author's concept of representational faithfulness to the 'underlying economic phenomena' (p. 32). Starting off from this position, which is, of course, based upon assumptions which would not be shared by all academic or professional accountants, it is not surprising that the author reaches the conclusion (Chapter 6) that the model of accounting which should be adopted is based on current values (more specifically value to the business, VTB, of which Solomons (1966) was a pioneer, with general indexation of the capital to be maintained). This striking conclusion is, of course, consistent with the ASC's *Handbook on Accounting for Changing Prices* (ASC, 1986), but it will inevitably strike trepidation into the hearts of those who suffered the controversies over the withdrawal of PSSAP7, ED 18, SSAP16 and its possible successor. It may therefore be safely anticipated that Solomons' courageous decision to extend his guidelines to the prescription of a current value measurement system will prove to be the most controversial of the fundamental aspects of the report.

However, there is much more to the Solomons guidelines than current value measurement. The broad thrust of the argument is as follows:

(1) The central purpose of financial reporting by a profit-seeking enterprise is to enable users of the information to assess the financial performance and position of the enterprise, to assess the performance of management, and to make decisions concerning their relationships with the enterprise. It is recognised that the four primary classes of users (investors, creditors, employers and suppliers or customers) will have

different needs and interests, but it is claimed that these needs can be broadly met by general purpose financial statements which provide information relevant to two central matters: profitability and viability (Chapter 2).

(2) The two elements of financial statements are assets and liabilities (Chapter 3). Revenues, expenses, gains, losses, owners' equity and income are 'subelements'. This is a consequence of Solomons' view that the balance sheet is the fundamental accounting statement and that income is a subordinate concept, resulting from changes in the owners' equity (assets *less* liabilities) adjusted for introductions (new issues) and withdrawals (dividends). Thus, he believes that the accounts should be articulated, the profit and loss statement being consistent with the balance sheet and measuring what, in the USA, would be called 'comprehensive income', i.e. all gains and losses. He is willing to segregate revenues from gains and expenses from losses, in order to isolate the effect of the entity's principal operations (revenues and expenses). Assets are defined as 'resources or rights incontestably controlled by an entity at the accounting date that are expected to yield it future benefits' and liabilities are defined as the mirror image of this.

(3) The qualitative characteristics of accounting information are grouped under two headings, relevance and reliability (Chapter 4). Under the reliability heading, Solomons includes representational faithfulness, which 'requires that there should be substantial correspondence between the captions and quantities depicted in statements and the underlying economic phenomena that are being represented' (p. 32). There is also discussion of the trade-off between certain characteristics, such as relevance and verifiability, of how uncertainty might be depicted, and of prudence, which is found to be 'incompatible with the notions of representational faithfulness and consistency' (p. 41).

(4) Recognition in the financial statements (as opposed to mere disclosure by way of note) should depend on three factors: conformity to the definition of an asset or liability (or subelements derived from them), reasonable certainty of verification and measurement, and materiality of the amount (Chapter 5, p. 43).

(5) Measurement is inseparably linked with recognition (p. 43), and the preferred model of measurement (Chapter 6) is current value, based on Value to the Business (VTB), and with real terms financial capital maintenance (i.e. money capital adjusted by a general price level index) as the basis for assessing income or gains in a period. This 'real terms' system is illustrated (p. 56) by a pro forma profit and loss account which calculates current cost operating profit and proceeds, through adjustments for real holding gains and losses, to derive a real income figure as the 'bottom line', although the reader has already been warned (p. 27) that there is a danger in concentrating on the bottom line rather than on the components of income.

(6) An Appendix (pp. 62–70) discusses the application of the Guidelines to five important topics in financial reporting (deferred taxes, pensions, financial commitments, goodwill, and the time value of money).

In a brief conclusion (pp. 60–1) Solomons justifies the need for his own Guidelines, rather than recent proposals by other bodies (FASB, IASC, and professional bodies in Canada, Australia and Scotland) on six grounds: The Guidelines refer specifically to 'the *British* accounting scene'; the primary use is seen as 'the assessment of enterprise and managerial performance'; The balance sheet is regarded as the primary financial

statement'; 'great importance is attached to representational faithfulness', 'the ubiquity of uncertainty…is given due emphasis', and 'the need to move from the present HCA model is argued strongly'.

Critique of the Solomons Guidelines

An appropriate point of departure for assessing Solomons' Guidelines is his own claims for them, summarised in the preceding paragraph. Few would argue that a document addressed to the ASC should not refer to the British accounting scene, although it may be disputable whether the British scene differs greatly from, for example, that in Canada or the USA insofar as the desirable fundamental properties of accounting reports are concerned. Indeed, international pressures for harmonisation may make it desirable to find an internationally acceptable solution to British problems. Equally, few would argue with the central role accorded in the Guidelines to the assessment of enterprise and managerial performance, although the Guidelines are not unique in this. The FASB conceptual framework, for example, encompasses this objective, although it may not be so sharply focussed. This leaves us with four distinctive and more controversial claims to originality: the primacy of the balance sheet, the emphasis on representational faithfulness, the advocacy of the 'real terms' model of measurement and the treatment of uncertainty. The first three are closely related, and the latter is a distinct and less controversial issue, although one which raises some difficulties which are worthy of discussion.

The issue of the primacy of the balance sheet, and its relationship to the 'comprehensive income' approach (income as change in net worth) have already been mentioned. This is a basic *assumption* made by Solomons and it is possible to disagree with it. Clearly, the logic of double entry book-keeping does lead us to the articulation of accounts (income as change in net worth) unless we introduce reserve accounting (enabling changes in net worth to by-pass the income statement). However, reserve accounting is widely practised, possibly in some cases to the detriment of users of accounts, but perhaps in other cases to improve the informational content of the income statement. Macdonald (1975), for example, has made the case for using different measurement conventions for the balance sheet and the income statement if the two are to perform useful distinct roles (one as a measure of income, the other as a measure of wealth), and more recently similar ideas have been proposed by authors such as Lee (1979) and Thomas (1979) in the context of cash flow (rather than income) reporting. Equally, a similar thought could be said to underlie the concept of current cost operating profit, which may explain Solomons' apparent hostility to it. Current cost operating profit, based upon the concept of maintaining operating capacity (which Solomons discusses as 'too nebulous a concept', p. 55) attempts to give an indication of the income generated, in current prices, by the firm's activities. Holding gains and losses are regulated 'below the line' to reserves, on the ground that they are not relevant to a continuing business which is committed to maintaining its operating capability.

This is not to say that Solomons' assumption as to the primacy of the balance sheet is inappropriate. He could have assembled powerful theoretical arguments in its favour, e.g. the Edwards, Kay and Mayer (1987) demonstration that 'real terms' accounts, such as Solomons proposes, can provide rate of return measures which are good proxies for

economic rates of return. This demonstration relies on the articulation of accounts, which allows changes in balance sheet values to enter into total profits or gains (the numerator of the rate of return). However, it is clear that there are tenable alternative views (e.g. those which support current cost operating profit as a central performance measure), and an academic critic is bound to point out that these are not seriously discussed, although perhaps the potential audience of the Solomons Report craves simplicity (even when it is unattainable) and would be confused by such complications.

This brings us to the second, and closely related, issue: representational faithfulness. Solomons is already well known for his adherence to the view that accountants should eschew the political approach of adapting their information to appease interest groups, and should rather pursue the 'map-making' approach of portraying economic reality. Unfortunately, even maps do not portray some central geographical reality but rather provide selected information designed to meet particular uses (e.g. political maps, relief maps, geological maps etc.). Moreover, even the selected information which they do portray can be subjective and controversial, most obviously in political maps, when the national or political proclivities of the preparer are inclined to affect the location of boundaries. The same is, unfortunately, true of the underlying economic reality portrayed by accounts, including Solomons' fundamental 'elements' (assets and liabilities) and 'subelements' (such as owners' equaity and income). The latter concept plays a key role in Solomons' scheme of things, e.g. as portrayed in the pro forma income statement on p. 56 of the Guidelines. It would be inappropriate for the present author to criticise this proposal, since it is entirely consistent with his own (e.g. Tweedie and Whittington, 1985). However, it is necessary to question whether its justification lies in a one-for-one mapping of economic reality, or whether its 'representational faithfulness' is based on a more subtle, multi-dimensional and approximate form of representation. Solomons himself warns us (p. 27) of 'the danger from paying too much attention to the bottom line'. Elsewhere (p. 69) he suggests that goodwill is too subjective to be measured, so that the balance sheet cannot fully represent owners' equity. Thus, he seems to concede that the interpretation of accounts is a matter of building up a subjective picture based upon different items of information, some of which will be elements or subelements of his system, but others of which (such as knowledge of the market in which the firm operates) will be outside it. If this is his view, it seems a little harsh to dismiss the current cost operating maintenance concept entirely, because it may have potential use in building up the total picture in some circumstances, and, indeed, it does feature as a component of his pro forma income statement, despite his harsh words about the concept of operating capability. Equally, it might be felt that his adherence to value to the business (VTB) as the valuation base implies too single-minded a view of economic reality: the alternative cases for net realisable value (NRV), replacement cost and multi-column reporting have all been made eloquently by others and do not receive adequate consideration in the Guidelines, despite brief reference to the recent ICAS research publication, *Making Corporate Reports Valuable* (1988), which favours NRV.

The issue of the nature of the underlying economic phenomena which accounts are trying to represent leads us to the discussion of the third issue, Solomons' advocacy of real terms accounting. Although his dismissal of alternative current value systems may be cursory, his critique of historical cost accounting under conditions of changing prices is entirely convincing, as is his advocacy of *some* method of reflecting current prices in

accounts. It would be unfortunate if, in debating whether the Solomons proposals are ideal or best approximations to users' information needs, we lost sight of the more important point, that, for decision making purposes, it seems likely that prices ruling at the accounting date will be more relevant than prices established in earlier periods, i.e. historical cost (HC).

However, although we may agree with the greater relevance of a system such as the real terms approach supported by the Guidelines, it is still possible to question the wisdom of extending the Guidelines to recommending a specific measurement base for accounts. Neither the FASB nor the IASC have been so adventurous in their conceptual frameworks. One reason for this is, of course, the extreme difficulty of obtaining general acceptance of any valuation basis other than HC, particularly in the aftermath of the widespread collapse of price-change accounting experiments in countries throughout the English-speaking world. Solomons' defence is that he is producing Guidelines which ASC should follow 'if it were free to go its own way' (p. 7). This is a most respectable intellectual position, but unfortunately it is likely to inhibit the possibility of the Guidelines being accepted by the ASC, as long as it remains in its present embattled position.

The fourth issue which arose from Solomons' claims to originality was the way in which he deals with uncertainty. This is certainly an important issue for accountants, and one which has been inadequately considered previously, so that he performs a useful service in putting the matter firmly on the agenda. Whether he deals adequately with the matter is another question. Even at the crucial stage of defining the basic elements, in the discussion of liabilities (p. 22), we have the distinction between a *'possibility'* and a *'probability'*, the former to be disclosed in a note, and the latter to be part of the financial statements. Since both 'possibility' and 'probability' amount to assigning a subjective probability to the event, presumably the distinction rests on the level of subjective probability which is assumed (e.g. a 'possibility' might be something which is accorded a probability of less than 0.5), but this is not made clear. The same problem reappears in the general discussion of recognition (p. 28) when we are told that an asset such as a sweepstake ticket 'would not generally gain admission to a balance sheet because the promise of economic benefit is too uncertain'. This statement is appropriately hedged ('generally') but it leaves us in a state of uncertainty almost as great as that of the holder of the sweepstake ticket. For example, suppose a whole portfolio of sweepstake tickets were held. Presumably, we should then look at the uncertainty of the returns of the group: if the firm held all of the tickets in the sweepstake, there would be no uncertainty at all, and the tickets would qualify as an asset, just as they would qualify as a liability if the firm were the promoter of the sweepstake. However, once we concede that we have to consider each asset as part of a portfolio, there is no obvious reason why we should relate its risk only to that of assets of the same type, so that it might strictly be necessary to evaluate each asset (and liability) in relation to all of the other assets (and liabilities) of the firm.

It would be unreasonable to expect the brief Guidelines to solve all of these problems, and, as has already been conceded, it is appropriate that the Guidelines should draw attention to the problem of uncertainty. However, it is also apparent that accounting standards based on the Guidelines could potentially lack consistency with one another, given the lack of clear guidance as to when 'possibility' becomes 'probability'. This is

less important than it might be, because the issue is merely whether the item subject to uncertainty appears in the main accounts or is reported by way of note. This does, however, draw attention once again to Solomons' possibly excessive emphasis on his two basic 'elements' and the importance of their giving a faithful representation of the underlying economic phenomena. Those economic phenomena which are very uncertain, but nonetheless real and potentially very important, will not be included in the rigorous structure of elements and subelements. It is not, therefore, possible to claim that this structure alone is adequate for a representationally faithful reporting system. Presumably, its justification is that it gives that sub-set of relevant information which can be stated with reasonable certainty. A 'devil's advocate' for historical cost might argue that the HC of assets, liabilities and completed transactions is all that can be stated with reasonable certainty. Given the nebulous nature of 'reasonable certainty', it is difficult to refute this argument logically.

This raises a wider issue concerning the Solomons framework. Ultimately, it is not derived by a process of rigorous logical deduction from a set of explicit axioms. Rather, it is based on judgment and its logical content is of a looser kind: its proposals are consistent with its assumptions (e.g. about the uses of accounts) but are not the only possible proposals which could be so. Thus, it is quite possible to accept the assumptions and intentions of the Guidelines but to propose an alternative system. The Guidelines must therefore ultimately rely for their acceptance on their intuitive appeal as much as on their internal logic.

It is also the case that the Guidelines would not remove all uncertainty about how particular problems should be dealt with. Solomons makes this clear in his introductory chapter (p. 7), and, perhaps unwittingly, he underlines it in his Appendix, 'Illustrative Material on Recognition and Measurement' (pp. 62–70), which contains some potentially controversial examples of how his Guidelines might be applied to specific problems. For example, his first illustration is a discussion of deferred taxes. This concludes that the full provision method (as currently practised in the USA) is preferable to partial provision (which is current UK practice). This conclusion is based upon the assumption that a 'timing difference…initially gives rise to a liability' (p. 62). This is certainly not the strict legal position (the liability is contingent upon the company continuing to make a taxable profit and on the precise form of the future tax regime) and there is a considerable continuing debate on the subject (a useful summary of the earlier debate is Beresford *et al.*, 1983). Solomons justifies his assumption by appeal to 'widespread though not unanimous agreement'. If we are to rely on widespread agreement to determine standards, the proposed guidelines can hardly be said to fulfil a useful role in changing the present situation.

Conclusion

Both the Dearing Report and the Solomons Guidelines are responses to the current pressures on financial reporting which were described earlier. Both therefore aim to be practical documents, intended to be comprehensible to and acceptable by a wide constituency (including the type of robust, common-sense critic characterised by a distinguished former President of ICAS as 'the small practitioner in Wick'). It may

therefore have been unfair to have subjected them to academic criticism, on the ground that their recommendations are not supported by the type of evidence which would justify the award of a PhD. Equally, it would be wrong to fall into the trap of expecting the degree of originality expected in a PhD thesis, and for this reason, comparisons with earlier reports of a similar nature have been avoided, despite the obvious pedigree of the present reports, stemming, for example, from the Wheat Report (on standard setting) and the Trueblood Report (on the objectives of company reports) in the USA and *The Corporate Report* in the UK (all of which appeared in the early 1970s).

However, there is substance in the academic criticisms made earlier, because they impinge potentially on the practical effectiveness of the proposals. In the case of the Dearing Report, it is possible to live with inadequate evidence provided that the proposals work. In the case of greater independence from the accounting profession and greater legal backing, the proposals do hold the possibility of working, in the sense that they might be more effective than the current ASC. However, a crucial gap in the proposals is the lack of a clear statement of guidance as to what type of standards the new ASB is supposed to produce. We have already seen that, on the form and content of standards and the role of a conceptual framework, the Dearing Report is ambivalent, and it seems curious to design a system in such detail without a clear specification of the product.

The Solomons Report does potentially fill some of the gaps left by the Dearing Report. Its objectives are admirable and it has many good features (a message which may have been obscured by the earlier critical discussion). It has two broad weaknesses. Firstly, it tends to provoke unnecessary controversy by its emphasis on representational faithfulness and a particular current value system, rather than by admitting more clearly (i) that representational faithfulness involves approximations, (ii) that the preparation and interpretation of accounting information are inevitably subjective processes (although we wish to achieve as much consistency as possible), and (iii) that a variety of valuation systems have some merit, but that for the sake of simplicity and consistency, VTB seems to be a sensible base to choose. Secondly, by stepping into the minefield of valuation, Solomons has prejudiced the practical possibility that his guidelines will be followed in the immediate future. Although this is a weakness from a practical point of view, it is a strength from a conceptual standpoint, because his guidelines make clear that it is extremely difficult, if not impossible, to deal adequately with recognition without considering measurement. Moreover, the current state of accounting standards provides an eloquent testimony to the problems which can arise from not having a consistent policy on valuation.

The ultimate test of the Dearing and Solomons Reports will be their practical effect. This implies two stages: acceptance and successful implementation. Current signs (as of July 1989) are that the Dearing Report has found favour with the government, and will receive some support, in the form of amendments to the Companies Bill. It is therefore likely to pass the first part of the test. The Solomons Report has been received kindly but not enthusiastically by ASC, which has welcomed the IASC's simpler and more limited conceptual framework, which does not address the valuation problem. Thus, the Solomons proposals may not even pass the first stage of the test. However, their author can console himself with the thought that the ASC will probably take the modest but desirable step of accepting the IASC document partly as a defensive measure against the more radical Solomons proposals, which are also on the table. Equally, he can be assured

that, in the longer term, the issue of choosing a systematic measurement model must also inevitably be re-opened, if the Dearing proposals are successfully implemented and the ASB tries to put flesh on Dearing's somewhat imprecise exhortations to produce better standards than we have at present.

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Financial Reporting: Current Problems and Their Implications for Systematic Reform

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Introduction

Financial reporting has been an area of exceptional innovation in the UK and elsewhere during the past five years or so. Such issues as off-balance sheet financing, accounting for complex capital issues and, more recently, accounting for brand names have become matters of considerable contention and are widely regarded as 'problems' with which the standard setting bodies should deal. The object of this paper is to examine a number of these problems and to identify their common characteristics. We then consider possible systematic principles which the standard setters might adopt in order to cope with these common characteristics and thus eliminate, or at least alleviate, the problems.

Some degree of innovation in financial reporting practices might be regarded as a healthy response to a changing environment. However, from the point of view of the standard setter, some recent innovations can be regarded as problematic because they tend to contradict the principle of standardisation, that like things should be treated in a like manner to enable comparability of accounts, either across different companies or within the same company. They do this either by introducing new types of contract or transaction with which existing standards do not cope (as in the case of complex capital issues) or by enabling the 'repackaging' of transactions which allows them to be treated in a different manner from that prescribed by standards for conventional transactions (as in the case of some creative accounting devices used to justify the application of merger accounting to transactions which would normally be treated by the acquisition method). In considering these innovations as problems we are not implying criticism of them or of particular cases; in many cases they are natural developments (e.g. in the case of finance leases, which were a response to the investment incentives given by the corporation tax system, rather than a deliberate challenge to extant accounting standards) and they have served to highlight the limitations and contradictions of the existing standards. The problems have largely arisen because existing standards have either not kept up with new developments or leave too much freedom of choice. Our purpose in examining these issues is to identify lessons for the future, in particular for standards setters.

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Our approach to the selection of systematic principles is to accept the broad consensus on the purpose of financial reports that exists between the Trueblood Report (AICPA, 1973) in the USA and *The Corporate Report* (ASSC, 1975) in the UK, in the 1970s, and, more recently, the conceptual framework projects of the Financial Accounting Standards Board (FASB) in the USA and of the International Accounting Standards Committee (IASC, 1989), the Solomons Report (Solomons, 1989), and the ICAS publication, *Making Corporate Reports Valuable* (McMonnies, 1988), in the UK. Although there are important differences of detail, all of these sources are broadly agreed on the following:

(1) That financial reports are intended to serve *users* and that equity investors and lenders are important components of the user constituency.

(2) That the balance sheet and the income statement (or profit and loss account), supplemented by a flow of funds statement (or possibly a statement of cash flows) are *the fundamental financial statements*.

(3) That users are concerned with *economic* evaluation and decision-making. This implies that measurement should strive to reflect actual economic opportunities and steers us towards current valuation and the estimation of future prospects, rather than historical cost valuation and concentration on past transactions. Insofar as disclosure is concerned, it implies disclosure of all matters which are material to economic decisions and evaluation. The ICAS group (McMonnies, 1988) bravely pins its faith in identifying economic reality, and Solomons adopts the concept of 'representational faithfulness'. We would follow these examples if we were sure that we could define economic reality in a manner which would find general acceptance and could be represented faithfully in practice. Instead, we prefer the more cautious approach of seeking *economic relevance*. The idea of economic relevance is consistent with what is sometimes called an *informational* perspective of financial reporting (e.g. Beaver, 1981, chapter 1). This views accounts as collections of useful information which the user will then interpret to produce a subjective evaluation of the firm. Economic reality, on the other hand, has connotations of identifying 'true' income or value, and the idea of identifying such single-valued summary measures of overall performance or worth seems to us to be inappropriate in a realistic setting of uncertainty and market imperfection or incompleteness.

The rest of this paper proceeds as follows. Firstly, we outline briefly the current issues which we have chosen to describe as problems (defined in the columns of Tables 1 and 2). Secondly, we attempt to derive a taxonomy of the common characteristics of these problems. Thirdly, we discuss the broad principles which we might adopt in order to deal with these common features and thus with the problems themselves. The paper is written with the institutional context and recent experience of the UK primarily in mind, although most of the issues discussed are relevant in some degree to the USA and to other market economies where financial reporting is carried out against the background of active securities markets.

The problems

The recent problems of accounting standard-setting in the UK revolve around what is sometimes called 'creative accounting'. Griffiths (1986) provides a highly readable

account of this area of activity, and the high sales of his book are an indication of the importance of and the widespread interest in creative accounting. This book is already, to some extent, out of date, failing to deal with such issues as brand names (which has already become the subject of two ASC technical releases and an exposure draft) and complex capital structures such as that of United Biscuits, which is described in Appendix I to this paper. More up-to-date and technically detailed accounts of current problems will be found in the commentaries contained in *Financial Reporting*, the survey of published accounts which is published annually by the Research Committee of the Institute of Chartered Accountants in England and Wales (Skerratt and Tonkin, 1990).

(1) *Off Balance Sheet Financing*

(i) Leasing. The first of the new creative accounting devices was the finance lease. The growth of lease financing had its origins in tax incentives rather than in any wish to indulge in creative accounting. However, it became apparent that, by entering into certain forms of lease, manufacturing firms could enjoy and exercise virtually all the privileges of ownership of the assets, and incur the equivalent liabilities and costs, whilst formally not owning the relevant assets. Thus, the assets and the corresponding liabilities under the lease would not appear in the balance sheet, in contrast with the case when the asset was brought about and the purchase financed by a loan. Leases of this type therefore offered creative accounting possibilities, as a means of reducing the gearing ratio measured in balance sheet terms (the slice of assets excluded being effectively 100 per cent geared).

The leasing problem was dealt with by ASC in SSAP21, which distinguishes operating leases, of the traditional rental type, from financial leases, which are effectively loan-financed purchases. The essence of the finance lease is that it embodies a series of related conditions which ensure ultimate acquisition of the benefits and risks attaching to the asset. Thus, the economic effect, but not the legal form, is the same as for outright purchase. Although SSAP21 exists, there are marginal cases in defining a finance lease. There are companies such as British Airways whose effective asset base and liabilities are not wholly on balance sheet as a result of the extensive use of leasing (Appendix 2) and the arbitrary nature of the leasing standard's rules.

(ii) Non-subsidiaries

The off-balance sheet financing problem has been made much greater by the use of controlled non-subsidiaries, i.e. companies which are effectively owned and controlled by the holding company but which do not fall within the strict Companies Act definition of a subsidiary. One of the easier methods of achieving this result was to exercise control of the subsidiary, through voting rights, whilst not owning a majority of the equity or controlling the composition of the board of directors. This route has now been closed by the Companies Act 1989, which makes control a condition for a company to be a subsidiary. ED49, issued by the Accounting Standards Committee, attempts to close the remaining gaps by means of a definition of a 'quasi-subsidiary' which must be treated, for group accounting purposes, as a subsidiary. A quasi-subsidiary is defined in terms of effective control by and benefits or risks accruing to the reporting enterprise.

(iii) Contingent contracts
The area of contingent contracts is an important problem currently facing preparers and auditors of accounts. Contingent contracts are a natural outcome of the increasing sophistication of capital markets and of corporate financial management, but they lend themselves to being used purely for cosmetic purposes, to remove weighty liabilities or risky investments from the balance sheet of the holding company. An example of such a contract would be one of sale of stock with an option of future repurchase on terms which were highly likely to be attractive. ED49 proposes that the method of financial reporting should reflect the overall effect of a series of related transactions, rather than a single transaction in isolation. Moreover, it defines assets and liabilities in terms of 'probable future' effect, thus attempting to overcome the contingency problem. This appears to be a potentially powerful method of dealing with these complex transactions although it inevitably also raises certain difficulties inherent in any general solution. In particular, the word 'probable' lacks a clear definition in current accounting practice, and estimating future events always introduces a degree of subjectivity. Thus, the auditor's professional judgement is put under greater stress by this type of remedy.

(2) *Group Accounts*

Group accounting has created problems other than off-balance sheet financing. Notably there are four important aspects: the choice of merger or acquisition accounting, the calculation of fair value and goodwill at the time of the merger, the subsequent treatment of goodwill, and the treatment of associated companies.

(i) Options for accounting for combinations
The choice of two methods of accounting for business combinations, the 'merger' method and the 'acquisition' method, naturally gives rise to the possibility of inconsistent treatment, and therefore creates a potential problem. Merger accounting offers the possible advantages of greater accumulated profits, higher profits for the year of acquisition and higher prospective future profits (because of lower depreciation charges on fixed assets and absence of any amortisation of goodwill), together with a lower valuation of assets, which will raise the apparent rate of return. Acquisition accounting, on the other hand, might offer advantages where a high asset valuation was important (e.g. to reduce the apparent gearing ratio), by offering the opportunity of a mandatory revaluation at 'fair value', although revaluation would also be possible on a voluntary basis under merger accounting. A further possible advantage of acquisition accounting is the opportunity of making provisions for reorganisation expenses, which can be written back in the future to smooth profits. Such provisions are not charged against income in the year of acquisition but reduce the net assets of the acquired company, thereby increasing goodwill: in the UK at present, goodwill is gener ally written off immediately against reserves. Some companies have seen the relative advantages as favouring merger accounting and have striven to qualify for it by artificial means, such as vendor placings, which make the acquisition look as though the main purchase consideration was shares (the requirement for merger treatment) whilst enabling the vendor to receive cash. However, the real problem for standardisation is not the cosmetic transaction (such as

vendor placing) but the existence of two different reporting treatments for identical events, one based on restatement to fair values and one (the merger treatment) on pooling of historical costs.

(ii) Goodwill

The calculation of goodwill and fair value at the time of the acquisition are problems of establishing open market prices when market transactions relating to the particular assets have not taken place. When part of the business acquired requires reorganisation, there may also be the problem of assessing a provision for reorganisation costs. These problems give scope for the cosmetic accountant to under-value the business acquired, thus improving apparent future profitability. Guidance on the principles to be adopted in assessing fair value and goodwill may eventually serve to limit the scope for cosmetic accounting. Merger accounting avoids these problems altogether, but at the price of ignoring the value implications of the acquisition transaction.

The subsequent treatment of goodwill is controversial. One possibility is to write off goodwill immediately against reserves, thus relieving the profit and loss account of any future amortisation charges. Some companies have been so eager to do this that they have created negative reserves in the process. The other extreme is to retain goodwill in the balance sheet permanently, thus again avoiding amortisation charges and also improving the gearing ratio, as measured in the balance sheet. This is outlawed by current company law, which requires the third alternative, that capitalised goodwill be written off by the end of its useful economic life. This has the effect of depressing measured profits, and thus earnings per share, which is a central figure used in the stock market evaluation of shares. The problem of goodwill is created by a choice of treatments of identical situations. There is, more fundamentally, a deep confusion amongst accountants as to whether goodwill is an item which should be regarded as an asset meeting the requirements for inclusion in the balance sheet, an issue which is also raised by the brand names controversy (discussed below).

(iii) Equity Accounting

The final major aspect of group accounting which gives rise to problems is accounting for associated companies, i.e. non-subsidiaries in which the holding company has nevertheless a substantial interest. The profits of associated companies are accounted for on an equity basis, i.e. a share of the profits, rather than merely dividends received, is included in the accounts of the investing group so that there is thus a strong incentive to classify investments as being in associated companies, if it is wished to boost reported profits. This gives rise to a need for clarity and consistency in the rules for defining associated companies. It also raises the important issue that too much weight should not be attached to a single ‘bottom line’ earnings figure.

(3) *Complex Capital Issues*

The problems of group accounting described above have been made more important in recent years by the high level of take-over activity in capital markets. Those markets have also been innovative and another problem, that of complex capital issues, arises directly from this. Examples of complex capital issues are given in Appendix 3. One typical

feature of such issues is the discount on issuing a loan stock. A 'deep discount bond' which has a heavy initial discount can attract a low interest rate because of the ultimate gain accruing when the bond is redeemed at nominal value (Appendix 3, Example 1). This can be a useful type of financial instrument, deferring interest payments and effectively rolling them up in the redemption value, when the company might be better able to pay. However, accounting on the basis of the cash transactions would lead to an understatement of interest expense in the years prior to redemption, if the expense were based only on the interest paid, rather than the prospective premium on redemption, resulting from the discount on issue. Furthermore, at the point of redemption the burden on the profit and loss account might possibly be avoided by treating the redemption premium as a capital item, e.g. being offset against a share premium account. A variation of this technique is the 'stepped interest bond', which has different rates of interest (usually increasing through time) at different periods of its life (Appendix 3, Example 2). A Technical Release of the Institute of Chartered Accountants in England and Wales (TR677) has recommended that the deep discount problem be dealt with by charging the accrual of the redemption premium over the life of the bond and that the stepped interest problem be dealt with by spreading the interest charges at a constant rate over the life of the bond. This solution involves looking at all transactions relating to the bond over its life, including future transactions, rather than judging a year's interest payments in isolation.

Another form of complex security involves various types of option. Convertible loan stocks, which have an option to convert to equity, have been fairly common for some time. They can have taxation advantages as well as offering bondholders an attractive option. However, options to convert or to subscribe for shares can also be used to exercise effective control over companies without formal legal control, they can give debt effectively the properties of equity, and they can create obligations which, although strictly contingent, are highly likely to crystallise in the future. Examples 3 to 8 of Appendix 3 give some indication of the variety of such arrangements. These raise the whole issue as to how far accounting should take a forward-looking, probabilistic view of the effects of transactions or should instead confine itself to a historical record of the formal effect of past transactions. The ASC's current exposure draft, ED49, takes the forward looking view, by preferring overall economic effect to strict legal form. United Biscuits, in the case discussed in Appendix 1, could have argued that the overall economic effect would have been to guarantee a conversion into the ordinary shares of the parent company. ED49 considers *virtual certainties,* e.g. the use of put and call options, where failure to act will cause one party to incur economic damage, so that it is almost certain that a particular course of action will be taken. In the United Biscuits case, however, there was no certainty that the stock market would behave in the way which the parent company anticipated, so that the ultimate decision to convert or redeem depended on factors outside the control of the parent company or its shareholders, and the eventual course of action was much less than certain.

(4) *Brands*

The most recent major controversy concerning financial reporting in the UK has concerned brands. This problem again arose from the activity of capital markets: highly

geared companies felt that the absence of brands from their balance sheets led to overstatement of their gearing ratios, and some take-over targets felt that it led to understatement of their assets per share. Thus, the brand problem can be seen to be part of the general problem of goodwill, the excess of the going concern value of a business over the sum of the fair values of the individual separable assets. Where the brand consisted of a copyright, patent or trademark acquired in the open market, it could appear in the balance sheet as a separate asset. However, the brand would often be acquired as part of a group of assets, so that its separate value was difficult to determine. The problem was particularly acute in the case of the internally generated brand, which had not, therefore, been the result of a clearly defined market transaction. In such cases, given the problem of establishing the acquisition cost, it was difficult to argue for the recognition of the brand as a separate asset in the balance sheet, although some firms (such as Ranks, Hovis McDougall) argued that their brands were worth large sums and should therefore be recognised.

It might seem that the forward-looking economic substance approach would favour the reporting of brand values. However, brands raise fundamental questions, which surround the general issue of accounting for goodwill (of which brands are a special case): should the balance sheet record the value of the *assets* of the business or of the business as a whole, and, if the former, is a brand an asset? The former question is clearly answered, in traditional accounting, by concentration on assets, since it makes no pretensions to economic valuation of the going concern, although the economic substance concept, which is implicit in many of the recent ASC pronouncements on creative accounting (e.g. SSAP21 and ED49), moves closer to economic valuation and therefore to the possibility of assessing the value of the business as a whole (the recent research report by ICAS, *Making Corporate Reports Valuable*, suggests a reconciliation of the stock market value of a company's shares with the value of assets per share). The second question raises the whole problem of defining an asset. One test is whether it is separable from the rest of the business, and this is an important feature of ASC's current proposal (ED52) that brands should be recognised only as part of goodwill, rather than separately. Another factor is the 'soft' nature of brand valuations, and this raises the question as to how far the economic substance approach can be carried in accounting practice, where reasonable reliability is required for measurement purposes. This, in turn, raises the question as to whether incorporation in the main accounts should be regarded as a vital issue: there is no law or accounting standard to prevent the directors of a company from including brand valuations in a note to the accounts.

This completes our view of some of the main current problems of financial reporting. This has not aimed to be comprehensive but rather to concentrate on the more important issues which have recently been seen as problems, with the object of identifying some common features. It is these common characteristics to which we now turn. As a prelude to this analysis, Tables 1 and 2 provide a taxonomic summary of the problem areas which we have discussed. These tables provide the raw material upon which the rest of this paper is based.

Common characteristics of current problems

Certain clear themes run through the problems described above and summarised in Tables 1 and 2. They can be classified conveniently under two conventional headings: recognition problems and measurement problems.

Recognition problems are concerned with what is included in the accounts as an asset, liability, revenue or expense. Two distinct types of general recognition problem facing the standard-setter can be identified from our catalogue of specific problems. Firstly, there are problems of defining the scope and nature of the reporting entity, and secondly there are problems of defining assets, liabilities and other components of the accounts (which the Solomons Report describes as 'elements' and 'sub-elements').

The problem of defining the boundaries of the accounting entity emerges most clearly in the case of off-balance sheet financing, particularly the case of non-subsidiary subsidiaries, where the central issue is the determination of which assets and liabilities are to be regarded as attributable to the group of companies. It also arises in the problem of associated companies, where the central issue is whether and under what circumstances a share of the undistributed profits of associated companies should be attributed to the group.

The problems of defining assets and liabilities and associated components of financial statements arise in a wide variety of cases. In leases, for example, the distinction between a finance lease and an operating lease depends upon a decision as to whether the lease contract is, in essence, a rental agreement, creating an expense (an operating lease) or a purchase and financing lease, creating an asset and a liability in addition to an expense (a finance lease). The general problem of goodwill also illustrates the problem of defining assets, and, in particular, whether the balance sheet should record only separable assets or should record the going concern value of the business. Other issues relating to asset definition which arise in connection with goodwill are whether an asset should necessarily be defined by an assignable legal right (such as a patent) and identified by a legal contract, such as purchase. These issues have arisen both in discussion of the problem of goodwill on consolidation and in the recent controversy on brand names.

A theme which pervades all of the above recognition problems is that of uncertainty about future events and how to deal with it. We have seen that contingent contracts have become quite common, particularly in creative accounting techniques, and these magnify the problem of uncertainty by making ownership and valuation dependent upon how certain options are exercised in the future. However, even in the absence of such contracts, economic evaluation is always dependent upon prospective outcomes, so that any attempt to base accounting on economic relevance, or some such concept, is bound to confront the problem of uncertainty. The Solomons Report, which does favour economic substance over legal form, recognises this difficulty and lists 'reasonable certainty'

Table 1

An Analysis of Creative Accounting Methods

		Means					
		Recognition		*Measurement*			
	Desired Effect	*Boundaries of Group Entity*	*Definitions of Assets, Equity, Liabilities, etc.*	*Valuation*	*Capital Maintenance*	*Accounting Problem*	*Possible Solution?*
	Off Balance Sheet Schemes						
1. Operating and finance leases	Reduction of gearing		✓			Loose definitions	Tighter definitions or emphasis on truth and fairness
2. Controlled non-subsidiaries	Removal of assets and liabilities from group accounts	✓				Legal definitions out of date/loose definitions in accounting standard	Redefinition of subsidiary (CA 89 & ED 49)
3. Contingent contracts	Removal of assets and liabilities from balance sheet		✓			Lack of definition of assets/liabilities	Redefinition of assets/liabilities
	Business Combinations						
4. Merger and acquisition accounting	Control of (i) profit for year of combination and following years (ii) gearing ratios			✓	✓	Two treatments dealing with similar event	One treatment

5.	Fair value	Avoidance of increased depreciation or improvement of gearing		✓	✓	Two treatments for similar situations	One treatment; one valuation system
6.	Reorganisation expenses	Increased income		✓	✓	Two treatments for similar situations	One treatment; write-off as extraordinary item?
7.	Goodwill/brand names	(i) Avoidance of annual amortisation (ii) increase or reduction of gearing ratios		✓	✓ ✓	Two treatments for similar situations	One treatment, based on a consistent definition of intangible asset
8.	Equity accounting	Increased profit	✓			Is retained profit attributable to the group?	Recognition only if cash retained in associated company is accessible
	Complex Capital Issues						
9.	Various	(i) Increasing profit (by reducing interest charge) (ii) Reducing gearing		✓	✓ ✓	(i) Profit does not reflect full interest charge (ii) Gearing ratio distorted	(i) Accrue full interest charge (ii) Redefine equity; borrowings; minority interest (iii) Develop rule on treatment of uncertainty of conversion
10.	*Irregular valuations*	(i) Higher income because depreciation charges low if revaluation delayed (ii) Gains on disposal greater if revaluation delayed (iii) Gearing radio reduced if revaluation undertaken			✓ ✓	No rule for regular revaluation	Requirement for regular revaluation

Table 2

An Analysis of Complex Capital Issues*

		Means					
		Recognition		*Measurement*			
	Desired Effect	*Boundaries of Group Entity*	*Definitions of Assets, Equity, Liabilities, etc.*	*Valuation*	*Capital Maintenance*	*Accounting Problem*	*Possible Solution?*
Deep discount bond (Example 1)	Avoidance of full interest charge			✓	✓	Income does not reflect real interest	Ensure discount accrued and charged

	against revenue					through income statement
Stepped interest bonds (Example 2)	Low interest charges against income in early years of bond		✓	✓	Effective annual cost not shown	Charge interest as it accrues
Convertible bond/preference share with premium on redemption (Example 3)	(i) Avoidance of full opportunity cost of interest (ii) Reduction of gearing (conversion assumed)	✓	✓	✓	(i) Income does not reflect interest charge (ii) Accounts based on estimated Stock Market prices in years ahead	(i) Ensure premium accrued and passed through income statement (ii) Rule required on conversion probability (iii) Definitions required of equity; borrowings; minority interest
Guaranteed (by parent) redeemable preference shares issued by subsidiary (Example 4)	Reduction of gearing (borrowings shown as group shareholders' funds); interest (i.e. guaranteed 'dividends') shown as minority interest in group accounts	✓			Confusion over (i) amount of minority interest (ii) whether payment to holders should be classed as interest or dividend	Definition of equity, borrowings, and minority interest; interest and dividends
Redeemable convertible preference shares issued at a premium by subsidiary (Appendix 1)	Increase in group shareholders' funds, improving gearing ratio Only nominal value shown	✓			Definition of minority interest and group shareholders' funds	(i) Definition of equity and minority interest (ii) Rule required on conversion

	as minority interest; premium shown as part of group shareholders' funds			probability
Redeemable convertible bonds issued at a premium by subsidiary (Example 5)	Reduction of debt. Only nominal value shown as debt-conversion is assumed	✓	Definition of bonds and minority interest	Definition of borrowing; and minority interest
Convertible preference shares issued by subsidiary with equivalent rights to parent's preference shares (Example 6)	Increase of disclosed shareholders' funds	✓	Definition of shareholders' funds	(i) Definition of equity and minority interest (ii) Rule required on conversion probability
Convertible capital bonds (Example 7)	Reduction of gearing	✓	Bonds have features of share capital	(i) Definition of equity and borrowings (ii) Rule required on conversion probability
Auction preferred shares (Example 8)	Reduction of gearing	✓	Fluctuating coupon rate similar to borrowing	Definitions of equity and borrowings

*Examples of each case are described in Appendix 3 (some cases have elements of more than one example).

of measurement as a criterion for recognising an asset. The more precise definition of reasonable certainty, in a form which is operationally effective, is a challenge facing any standard-setting body which chooses to follow the Solomons approach.

The uncertainty problem affects measurement as well as recognition, and we now turn to the measurement aspects of the problems discussed earlier. There are two central issues relating to measurement: (i) *valuation*, which determines the value of assets and liabilities in the balance sheet, and (ii) the *capital maintenance concept*, which determines the extent to which changes in shareholders' net worth, as measured in the

balance sheet, is partitioned between capital and profits,[1] and hence the extent to which gains in value are recognised in the profit and loss account.

However, although measurement can be reduced to these two central issues, each encompasses a wide variety of problems and options for dealing with them. Both issues were at the heart of the debate on accounting for changing prices, which raged for so long in the UK and elsewhere,[2] and current problems of both valuation and income measurement are due in part to the demise of the current cost accounting standard, SSAP16. The pressure of changing prices and the need to report their consequences still exists, but there is at present no systematic way of doing this, and current financial accounting practice in the UK is an uneasy hybrid of traditional historical cost and various methods of current valuation. Equally, the capital maintenance concept used in the recognition of profits is an *ad hoc* system involving reserve accounting but based upon no simple general principle.

The valuation problem pervades all current financial accounting practice in the UK,[3] and is not confined to the specific problem areas described earlier. Amongst these problem areas, as Table 1 shows, the valuation problem is, of course, a pervasive theme. Most obviously, it arises in the choice between merger and acquisition accounting, which involves a choice as to whether we retain original historical cost (merger accounting) or revalue the acquired company and its assets at the time of acquisition (acquisition accounting), with the attendant difficulties of establishing fair values and measuring goodwill. The brand names prob lem also has an important valuation dimension: the degree of uncertainty surrounding valuation is a strong argument for not recognising this type of asset in the accounts. More generally the valuation of fixed assets, and the consequent depreciation charges, have an important effect on the gearing ratio and on subsequent income, and the discretion allowed in valuing such assets (currently the subject of an ASC exposure draft) gives scope for inconsistency between companies, and therefore for cosmetic accounting. It is also important to remember that valuation applies to liabilities as much as to assets: for example, the problem raised by deep discount bonds is that the nominal value differs from their market value at the time of the issue.

The valuation problem usually works in conjunction with the capital maintenance problem, in its effect on income. Thus, the problem is not merely whether we revalue an asset or liability, but whether the effect of that revaluation will appear in the profit and loss account. Adherents of creative accounting like to accumulate such gains and losses in reserves, from which they can be fed into the profit and loss account at the wish of the preparer of accounts. This may be done in the cause of simple income smoothing, but it could be done with more sinister intentions. Our earlier catalogue of problems contained some good examples of the use of reserves to exercise control over profits, e.g. the write-

[1]This characterisation of the problem is consistent with the Solomons Report's view of the balance sheet as the fundamental accounting statement and assets and liabilities as the basic elements of financial statements. See Watts and Zimmerman (1986).

[2]We have surveyed this at length in *The Debate on Inflation Accounting* (Tweedie and Whittington, 1984).

[3]A survey of this, by one of the present authors, is Whittington (1989).

off of goodwill against reserves, to avoid the burden of future amortisation. One of the more obvious loopholes in contemporary accounting standards which we did not discuss earlier is the concept of 'extraordinary' profits or losses, which are not included in, or changed against, profits on ordinary activities (the measure of profit commonly used in valuing shares), in contrast with 'exceptional' items which are part of this measure of profit.

This completes our analysis of the common characteristics of the problem areas which we identified earlier.

Some possible remedies

One approach to dealing with the problems described earlier is to deal with each one individually on a 'fire fighting' basis. This has, of necessity, been characteristic of much of the earlier efforts of standard-setters. The disadvantage of this approach is that it can lead to inconsistency of approach (hence, perhaps, the wide variety of valuation methods currently in use and the inconsistency between certain standards, e.g. SSAP12 on depreciation and SSAP19 which advocates non-depreciation of investment properties). Furthermore, treating the symptoms rather than the disease can lead to the problems re-emerging in a different form, designed to circumvent the detailed prescriptions intended to deal with earlier forms, e.g. the write-off of goodwill against reserves has been one of the reasons for the emergence of brand accounting.

A more systematic and general and therefore, hopefully, more effective means of treatment is to design standards to deal with the deeper issues which are common to a number of problems. The identification of such issues was the purpose of the preceding section, and much of this section will be devoted to suggesting the possible lines on which accounting standards could deal with them. However, if we are to use the analogy of a disease, it may be that by 'treating' these general issues we are still treating symptoms (albeit more effectively than on a piecemeal basis) rather than the disease.

The central issue in accounting standard-setting (the 'disease' in our metaphor) is the market failure or failures which make accounting standard-setting necessary. One of these failures is that company managements *individually* have incentives to represent their company's performance in the best possible light (e.g. by creative accounting), although *collectively* they would like accounting practice to conform to high standards in order to inspire confidence in the markets in which they operate (i.e. there is what economists call a free-rider problem). A possible solution (a direct 'cure' for the 'disease') would be for management to be constrained to conform to high standards by the behaviour of users, particularly suppliers of finance,[4] and the auditors who act on their behalf. In practice, these forces are not sufficiently strong to avoid the need for standards. This is partly because auditors find it difficult to deliver a 'true and fair view' without the support of accounting and auditing standards, and partly because users of

[4]This is the basis of the Chicago/Rochester view that regulation of accounting should be unnecessary if users and preparers are freely contracting agents in a competitive market.

accounts allow themselves, or are believed by preparers of accounts to allow themselves, to be deceived by cosmetic accounting devices. The latter belief is reinforced by the apparently excessive weight given by financial analysts to 'bottom line' earnings figures and gearing ratios.

This is not the place to discuss in detail the problems of auditors or the limited skills of users,[5] but it is important to be aware that these are fundamental factors which will determine the extent and detail of accounting standards. Detailed prescription is in many ways undesirable: it can lead to inflexibility and to incentives to conduct a standards avoidance game analogous to tax avoidance. However, a vague injunction to auditors to ensure that the accounts 'tell it the way it is' will be inadequate unless auditors have a remarkably similar set of thought processes (so that there is consistency of judgement) and considerable integrity and strength in resisting what is often (wrongly) described as 'client' (i.e. management, not shareholder) pressure. Thus, *some* degree of detail in standards is necessary, and the level of prescription required is a practical matter which is contingent on the strength of the opposing forces. One flexible way in which a standard-setting body can respond to the practical need for prescription is to have fairly broadly defined standards but to issue more detailed interpretations when required. This practice has been followed by the FASB in the USA, although its standards are quite detailed and are not necessarily a model for others to follow.[6]

Whatever form of standard-setting process is adopted, there will be a need for some standards and for those standards to have a broad general direction. The implication of our discussion of current problems and their common characteristics is that the standards should aim to present data relevant to the *economic substance* of a firm's current position and past activities, rather than their simple legal form. Most, if not all, of the current problems are perceived as such because certain reporting methods currently in use do not convey to shareholders and other users of accounts an accurate picture of the economic effect of transactions, whereas users of accounts are increasingly concerned with this aspect of performance. The active capital markets which give rise to innovative transactions and financial instruments also make users of accounts increasingly interested in up-to date information on the economic position of the company, since the rewards for possessing such information are greater, just as the rewards for a successful creative accounting exercise are greater. Recent exposure drafts and standards of the ASC have, of course, adopted the economic substance approach (notably in ED49 and its predecessor ED42), as have two recent research reports from professional bodies, The Solomons Report (ICAEW, 1989) and *Making Corporate Reports Valuable* (MCRV) (McMonnies, 1988).

[5]Lee and Tweedie (1977 and 1981) provide empirical evidence of users' lack of comprehension of some fundamental aspects of accounting methods.

[6]Another possibility is to have an accounting court, similar to that in the Netherlands, which can allow detailed practice to evolve on common law lines, within the broad principles laid down by statute or standard. It should be noted that, under the provisions of the United Kingdom's Companies Act 1989, the courts may require revision of accounts which do not show a true and fair view. This raises the prospect of a new body of case law being developed, relating to the true and fair view.

It is unlikely that a broad injunction to follow economic substance will be adequate to ensure a level of standardisation which will aid the comparability of accounts. The concept therefore needs to be applied to the central themes which we identified in current problems, i.e. recognition and measurement. The final columns of Tables 1 and 2 are a tentative attempt to propose solutions for the problems identified earlier. These solutions are expressed in rather broad, even vague, terms, but this suits our present purpose, which is to identify the common themes which must be addressed in order to derive general solutions which span different problems in an effective and consistent manner.

With regard to recognition, there were two aspects of the problem: the boundaries of the entity and the components of accounts. A definition of the entity is needed (problems 2 and 8 of Table 1) which concentrates on economic substance and hence rules out off-balance sheet financing operations. It will also need to deal with associated companies. One issue which will need to be clarified is the relative importance of ownership and control and the extent to which these factors justify consolidation into group accounts. The informational perspective, which we advocated earlier, must also be borne in mind. Consolidation, to produce a single group 'bottom line', can lead to simplistic results, and disclosure of separate results for associated companies by way of note rather, than inclusion in the profit and loss account might be more effective means of dealing with marginal situations.

The definition of assets, liabilities and other components of the accounts in terms of economic substance (needed in relation to problems 1, 3, 7 and 9 of Table 1) has already been proposed by the Solomons Report, and elsewhere (e.g. as part of the FASB's conceptual framework project). It is notable from Table 2 that the definitions of equity, minority interests and debt are subject to particular problems at the present time because of the concern with gearing ratios. The main difficulty which needs to be resolved in this general area is that of uncertainty and, in particular, a more precise definition of the 'reasonable certainty' which Solomons requires as a condition for recognition in the accounts. Again, the informational approach may help: material amounts could be required to be reported by way of note, even when surrounded by a high degree of uncertainty, although 'materiality' may be particularly difficult to define when there is a high degree of uncertainty. Uncertainty affects not only *whether* an item is recognised in the accounts, but also *how* it is recognised. This is particularly the case when convertible securities are involved and there is uncertainty as to whether the conversion right will be exercised, and thus whether it is appropriate to treat the security as a liability or a part of shareholders' interests.

With regard to measurement, we identified two broad issues, valuation and capital maintenance. Of these, valuation poses the greater problems (see items 4, 5, 6 and 7, 9 and 10 of Table 1). The economic substance approach suggests that *some* form of current market value should be the basis of accounting practice, and both MCRV and Solomons agree on this. Current valuation is also increasingly common in accounting practice, albeit on a somewhat unsystematic basis. The problem is that a wide variety of current valuation methods is available: replacement cost, selling price and discounted present value being three broad categories, with alternatives within each category. MCRV adopts a selling price approach and Solomons prefers the eclectic value to the business basis (similar to that used in SSAP16) which selects the value according to economic circumstances. The choice of valuation base is a fundamental issue which requires a high

priority in the standard-setting process. It seems highly unlikely that a single current value method will be appropriate for all circumstances, since all can be shown to yield meaningless results in some cases (e.g. selling prices can be irrelevant in the case of 'non-vendible durables'—such as railway tunnels, which cannot be sold for operational reasons—or for which there is no market). If it is agreed that an eclectic method of valuation is appropriate, then a decision must be made as to whether the choice of method should depend on economic circumstances (as in the case of value to the business, or the older 'cost or market value, whichever is the lower' rule), or the nature of the asset (as in the Companies Act requirement to report the market value of listed securities) or the nature of the business (as in the accounting standard on the valuation of investment properties). The informational approach must also be considered: alternative valuations can be reported by way of note (as occurs in current practice). The full information solution of multiple column reporting (as proposed, for example, by Stamp, 1981) also deserves consideration, although it would raise in extreme form one of the problems of the full information approach, cost both to users (in interpreting a mass of information) and preparers (in preparing a variety of expensive information). If it is decided to report only a single current value, valuation according to the nature of the asset has much to commend it, despite its being relatively neglected in the academic literature. It has the advantages of being a natural evolution of current practice in the UK, of consistency across different types of firm, and of potentially being able to accommodate preparation costs and uncertainty of valuation in the most effective manner (since the existence of markets is likely to be specific to type of asset rather than type of firm or economic circumstances of the particular firm). Its obvious disadvantage, from a theoretical standpoint, is that it is unlikely to lead to an aggregate value of the net assets of the firm whose components are all measured on the same basis. This is an important drawback from the point of view of those (such as Chambers, 1970) who attach great importance to a single aggregate 'true' value: it is less important to those who prefer the 'useful pieces of information' approach.

The capital maintenance concept (see problems 4, 5, 6 and 7 of Table 1) may pose fewer difficulties. There are three broad approaches to this: money capital, real capital (i.e. money capital indexed by the general price level change) and physical capital (usually defined in terms of maintaining operating capability, which is not a simple concept). All have potential uses and there is no reason why all three should not appear in the same statement (Kennedy, 1978, provides a demonstration of this). In a manufacturing business, current operating profit (based on maintaining operating capability, broadly as suggested by the Sandilands Report, 1975, and as implemented in SSAP16, 1980, although the rules used there were not necessarily the best) may be a useful figure (showing ability to generate profit at current prices), but we may also be interested in the capital gains or 'holding gains' on the assets of the business. These can be added to operating profit to give total gains in money terms (again on the lines of the Sandilands Statement of Gains). The effect of general inflation can then be deduced to give a total real gains figure. The figures for total gains would articulate with the balance

sheet, and, by including all gains, would eliminate the problems of reserve accounting.[7] A similar proposal was made by the Byatt Report (1986) in its proposals for accounting for state-owned enterprise.

Concluding remarks

This paper has attempted to identify the common features underlying the most pressing current problems of financial reporting. The evidence has been in the form of examples rather than systematic survey results. We believe that survey results would support our broad conclusions (e.g. they are consistent with the annual surveys of published accounts published by ICAEW and edited by Skerratt and Tonkin) but we invite other researchers to test them against further evidence and to refine them. We have also attempted, by means of our taxonomy in Tables 1 and 2, to derive systematic 'remedies' which might deal with the problems which we identified. Again, there is scope for considerable refinement, both in relating 'remedies' to 'problems' and also in clarifying the nature of the 'remedies'. For example, in the case of the valuation problem, we have merely sketched out the broad direction of several possible alternative approaches, rather than specifying them in detail or attempting to narrow the choice in a definitive manner. In summary, we have tried to identify some important problems and to sketch out an agenda for research and the development of appropriate standards. We do not claim to offer definitive solutions, but hope at least to have provided evidence of the nature of the problems which exist, within the current context of UK financial reporting. At best, we hope to have defined the broad nature, if not the precise form, of satisfactory solutions. With regard to academic research, we have drawn attention to a number of areas requiring further investigation ranging from the clarification and documentation of 'problems' to the development of precise and feasible 'solutions'. In the latter area, a topic which should be particularly amenable to further academic research is the treatment of uncertainty, which has hitherto received far more attention in the auditing literature than in that of financial reporting.

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Appendix 1 The United Biscuits case

In 1988 United Biscuits issued, in an overseas subsidiary, redeemable preference shares convertible at the holders' option into equity of the parent company, United Biscuits, itself, with redemption options annually from 5 to 10 years after issue. The issue was worth £110m consisting of 22,000 £1 shares issued at £5,000 each. The shares were ultimately convertible into United Biscuits' equity shares with a nominal value of £9m. As there was then no definition of what constituted a 'minority interest'* this item was

*The Companies Act 1989, Schedule 2 defines minority interest as 'the amount of capital and reserves attributable to shares in subsidiary undertakings included in the consolidation held by or on behalf of persons other than the parent company and its subsidiaryundertakings'.

not shown, as might have been expected, at £110m. Instead, it was assumed that before 10 years had elapsed the share price of United Biscuits would have increased sufficiently to make it worthwhile for the preference shareholders to convert their shares and consequently minority shareholders were shown at £9m, being the nominal value of the equity shares to be issued by United Biscuits on conversion. The remaining £101m was reflected on group reserves where goodwill (arising on the acquisition the £110m was raised to finance) was written-off against it. If events did not turn out as expected then:

- minority interest would have been understated;
- the anticipated conversion would not have taken place;
- and, consequently, the effect of redemption would not have been reflected—at 5 years the redemption cost to the company would have amounted to £131.4m and at 10 years to £164.3m compared to the issue price of £ 110m (see also Appendix 3, example 3).

Appendix 2 The British Airways case—an operating or a finance lease

It is presumed that a finance lease exists if, at the inception of a lease, the present value of all minimum lease payments, including any initial payment, amounts to substantially all (normally 90% or more) of the fair value of the leased asset. The lease term is the period for which the lessee is contracted to lease the asset and any further terms which the lessee has the option to continue to lease the asset, with or without further payment, which option it is reasonably certain at the inception of the lease that the lessee will exercise (SSAP 21, paragraphs 15 and 19).

In the 1987 prospectus for British Airways 25 aircraft were shown to be on extendible operating leases, namely nine 757s and sixteen 737s. The cost to the lessor was some US$600m. The aircraft were obtained on short leases which enabled British Airways to return the aircraft up to the end of the sixth year with certain residual liabilities, not expected to be material. Up to the end of the sixth year British Airways could elect to convert the operating lease into a finance lease for the remaining portion of a 15 year term from delivery. It was clearly assumed that it was not reasonably certain that the lease would be extended and therefore the operating lease treatment was used in the accounts.

Appendix 3 Examples of complex capital issues

1. *Deep Discount Bond*

Example: a bond with a nominal value of £100 is issued at £40. The coupon rate is often nil or very low. The interest on the bond is in practice the £60 difference between the amount received and the amount paid over to the lender at the end of the loan term. Section 130 of the Companies Act 1985 enables discounts allowed on the issue of debentures of the company to be set off against the share premium account. According to

the law, therefore, the interest charge of £60 which is only paid on redemption could be charged to the share premium account, thereby bypassing the profit and loss account. This has yet to be done in practice although Greycoat Group PLC generated publicity in 1987 by announcing its intention to charge the deep discount directly to the share premium account:

Note 11—Capital commitments and financing (part):

> On 24 April 1987 the Company issued a £50,000,000 Zero Coupon Bond 1995 at 43.6496 per cent and the proceeds of £21,500,000 net of expenses were received on that date. The bond has been issued as part of the financing arrangements for the Group's property development programme. The discount due to redemption of the bond, being the difference between the nominal amount and the proceeds received, will be covered by part of the anticipated growth in the value of the related properties. As the discount on the bond will be met from the underlying capital growth, it will be written off in the accounts over the term of the bond directly against the share premium account. The amounts charged each year will be equivalent to the annual rate of interest implicit in the issue price of the bond. On completion, interest on the bank facilities financing these developments will absorb most of the anticipated rental income from the relevant properties.

Source: Greycoat Group PLC: Accounts for the year ended 31st March, 1987

No charges have yet been made against share premium account as in 1988 Greycoat amended its policy so that during the development of the property the accrued discount is capitalised. Following completion it will be charged to share premium account.

2. *Stepped Interest Bonds*

A bond is issued with interest of, say, 6% rising to, say, 26% in increments of 2% per annum. The objective of this particular financial instrument is to match low cash flows against low interest charges at the beginning of a project. TR677 issued by the Institute of Chartered Accountants in England and Wales suggested that the effective rate computed over the anticipated life of the bond should be charged to each annual profit and loss account irrespective of the amount paid in the year.

Some companies appear to charge the interest payable during the year, although the policy is not stated explicitly, e.g. Hambros Investment Trust PLC, 1988:

Stepped interest debenture stock

> Interest was payable on the stock at the rate of 11 per cent per annum for the year to 31st March 1988. The rate of interest will increase by 2 per cent per annum commencing on 1st April 1988 and thereafter by 2 per cent per annum until 1st April 1990 whereupon it will be fixed at the rate of 17 per cent per annum until final redemption.

If for any reason the stock becomes repayable under the terms of the trust deed prior to its redemption date the holders will be entitled to repayment of the nominal amount of their stock together with a sum of additional interest calculated in accordance with a formula set out in the trust deed.

The company or any of the subsidiaries will be entitled to purchase stock in the market or by tender (available to all holders of the stock) at any price, or to puchase stock by private treaty at any price (inclusive of accrued interest but exclusive of expenses) not exceeding 110 per cent of the middle market quotation of the stock (based on The Stock Exchange Daily Official List) on the last business day preceding the date of purchase, but not otherwise.

If not previously repaid or purchased by the company or its subsidiaries the stock will be redeemed at par plus accrued interest on 31st March 2018.

Source: Hambros Investment Trust PLC: Accounts for the year ended 31st March, 1988

3. *Convertible Bonds/Preference Shares with Premiums on Redemption*

A bond or preference share is issued at £1. Conversion terms are one bond/preference share for one ordinary share. The share price at the date of issue is 80p but the bond/preference share can be redeemed at the holders' option in five years time at 125p. In practice some companies have assumed their share price would be greater than 125p at the time of redemption and therefore conversion would take place. No accrual is made for the extra 25p potential liability which could be deemed either to be additional interest/dividend or, if converted, part of the opportunity cost of not selling the share on the market as a normal issue. For example: The Burton Group PLC 1987

During the year the Company issued, for general corporate purposes, £110 million $4\frac{3}{4}\%$ Convertible Bonds 2001 at 100% of nominal value. Bondholders have an option to redeem the Bonds on 25th August 1992 at a price representing $136\frac{1}{2}$ of the principal amount of the Bonds or to convert into Ordinary Shares of The Burton Group PLC at a price of 315p per share. No provision has been made for the additional cost, if any, in the event that Bondholders exercise their option to redeem the Bonds in 1992. The Bonds may be redeemed at the option of the Company at a premium to the issue price reducing annually until 25th August 1993 and thereafter at par, provided that the market price of Ordinary Shares is at least 410p per share.

Source: The Burton Group PLC: Accounts for the financial year ended 29th August, 1987

See also Appendix 1.

4. *Redeemable Preference Shares Issued by a Subsidiary (Guaranteed by Parent)*

Preference shares issued by a subsidiary which can be redeemed by the holder are guaranteed in respect of dividends and repayments by the parent company. The guarantees vary but could ensure that 'dividends' are paid irrespective of whether or not the parent company has distributable profits. Similarly, on liquidation of both the subsidiary and the parent it is possible, depending on the terms of the issue, that the holders of the preference shares would rank equally with the creditors of the parent company. Given that dividends for shareholders of the parent company can only be paid out of distributable profits and that holders of any form of shares in the parent would rank behind creditors the problem arises in the group accounts of whether the subsidiary's preference shares should be classed as debt. Example: BHH Group PLC.

Post balance sheet event note.

In March 1989 a new subsidiary, BHH Trading Limited, acquired a portfolio of properties from Slough Trading Estate Limited for a consideration of £43.75 million (including costs).

The acquisition was financed by the issue of preference shares in another subsidiary company which are redeemable in March 1996 at the total price of £45 million together with an amount equivalent to interest at LIBOR (subject to a maximum of 13.5% and a minimum of 10.5%) plus 1% per annum, less any dividends paid.

Guarantees [presumably by the parent company] have been given in respect of current dividends and redemption principal, and investors ultimately have recourse to the assets of BHH Trading Limited.

The following pro-forma balance sheet shows the effect of the acquisition as if it had taken place on 31 December 1988:

	31 December 1988	
	Pro-forma £000	*Actual £000*
Fixed assets	42,063	42,063
Current assets		
Stocks	72,510	28,760
Debtors	7,294	7,294
Cash at bank and in hand	11,778	278
	91,582	36,332
Creditors	(46,156)	(35,906)
Net assets	87,489	42,489
Called up share capital	17,664	17,664
Reserves	24,825	24,825
Shareholders' funds	42,489	42,489
Called up preference share capital	45,000	
	87,489	42,489

Source: BHH Group PLC: Accounts for the year ended 31 December 1988

5. *Redeemable Convertible Bonds Issued at a Premium by Subsidiary*

Bonds with a low nominal value are issued at a premium by a subsidiary. On redemption only the nominal value is repaid. However, the bonds can be converted into preference shares of the subsidiary company at the full amount of the money received and will be redeemed at that amount if not converted into equity shares of the parent.

In the accounts of J.Sainsbury plc for the 52 weeks ended 17th March 1990 the entire amount of such an issue has been deemed to be minority interest.

6. *Convertible Preference Shares Issued by a Subsidiary with Equivalent Rights to a Parent's Preference Shares*

Example: Costain Group PLC issued preference shares in a subsidiary with similar rights to those that preference shares of the parent company would have. In the balance sheet shares were shown outside shareholders' funds as 'preference share capital issued by a subsidiary' adjacent to, but not within, 'minority interest'. In the profit and loss account the preference dividends were shown after minority interests and extraordinary items.

Share Capital and Reserves

	Notes	1988	1987
		£m	£m
Called up ordinary share capital	21	44.3	41.7
Share premium account	22	64.6	37.5
Revaluation reserve	22	85.8	47.3
Profit and loss account	22	205.0	196.9
Related companies and long term joint ventures	22	16.4	16.1
Ordinary Shareholders' Funds		416.1	339.5
Preference Share Capital			
Called up preference share capital issued by subsidiary	23	46.7	—
		462.8	339.5
Minority interests		3.9	18.5
		466.7	358.0

Note 23 to the accounts

Preference Share Capital

On 24 August 1988, a subsidiary company, "Costain Finance N.V. incorporated in the Netherlands Antilles with limited liability, issued 9,600 $7\frac{1}{2}\%$ Guaranteed Redeemable Convertible Preference Shares 2003 at an issue price of £5,000 per share to raise £46.7 million, net of expenses. The issue was used partly to refinance the acquisition of Dow-Mac Concrete Limited (now Costain Dow-Mac Limited] and partly for general corporate purposes. The shares are guaranteed on a subordinated basis by Costain Group PLC, and convertible into, at any time up to 17 August 2003, ordinary shares of Costain Group PLC at £3.50 per ordinary share. The shares can be redeemed at their issue price on 24

August 1993 and upon the revocation, in certain circumstances, of the subordinated guarantee at prices between the issue price and 106 per cent thereof. Any shares outstanding on 24 August 2003 will be redeemed at their issue price.
Source: Costain Group PLC: Accounts for the year ended 31st December, 1988

7. *Convertible Capital Bonds*

These bonds are convertible into equity shares, usually via an exchangeable, redeemable preference share option (see example 5). The essential feature is that there is a mechanism to prevent the issuing group being obliged to repay the bond holder as a bond holder except in the event of default. The bonds will be guaranteed by the parent.

For example, such bonds were issued in October 1989 by British Airways PLC and presented between shareholders' funds and minority interest in the accounts as follows:

	1990 £m	*1989 £m*
Capital and Reserves		
Called up share capital	180	180
Reserves		
Revaluation	121	167
Other	(18)	(9)
Profit and loss account	629	411
	912	749
Convertible Capital Bonds 2005 (Note 19)	320	—
Minority Interests	—	1
	1,232	750

Extract from Note 19

In October 1989 British Airways PLC raised £320 million through the issue of 9¼ per cent Convertible Bonds 2005 by a subsidiary, British Airways Capital Limited. The Bonds were offered by way of rights to existing ordinary shareholders of the Company on the basis of four Bonds of £1 each for every nine British Airways PLC shares then held. The terms of the Bonds allow the holders to convert into British Airways PLC ordinary shares during the period 1993 to 2005 on the basis of one ordinary share for each £2.43 of Bonds held. The terms also provide that on maturity in 2005 the Company may require remaining bondholders to convert their Bonds into ordinary shares of the Company which would be sold on their behalf. If the proceeds of such sale are less than the issue price of the Bonds the Company has to fund any deficit from its own resources.

In these circumstances the Directors consider that it is highly probable that the proceeds of the issue of the Convertible Capital Bonds will become part of the Company's called up share capital in due course and therefore will be available to the Group on a permanent basis. Accordingly the Convertible Capital Bonds have been included in the Group balance sheet under Capital and Reserves.
Source: British Airways PLC: Accounts for the year ended 31 March 1990

8. *Auction Preferred Shares*

Auction preferred shares have been issued in the United States and are therefore denominated in US$, thereby possibly acting as an effective hedge for net investment in US businesses similar to the use of currency borrowings as a hedge under SSAP20 principles. Usually a panel is formed to invest in these shares. The panel periodically bids for them by stating the coupon they require to be paid on the shares. The effect is that a market rate of interest is always paid on these preferred shares. The shares are not repayable except at the option of the issuer and therefore they do not possess a major feature of debt, i.e. repayment at the behest of the holder. Repayment only takes place either at the option of the issuer or on winding up after all creditors have been paid.
Example: Thorn EMI

Extract from Minority Interest note

	1989 £m	1988 £m
Preference shares in subsidiaries:		
5½ per cent Guaranteed Redeemable Convertible Preference Shares 2004	103.0	—
Auction Preferred Stock	118.3	105.8
Other	7.8	19.8
	229.1	125.6

Thorn EMI America Finance Inc., a wholly-owned subsidiary registered in Delaware, USA, has in issue 200 shares of Auction Preferred Stock of US$1m each. The dividend rate varies (predominantly with prevailing interest rates) and is set every 7 weeks at an ‘auction’ at which the shares are also traded. Funds raised from this issue have been loaned to other Group subsidiaries. Repayment of the loans is guaranteed by the Company.

Source: Thorn EMI PLC: Accounts for the year ended 31st March, 1989

Corporate Governance and the Regulation of Financial Reporting

Geoffrey Whittington*

Abstract—This paper examines the inter-dependent role of corporate governance and financial reporting within the institutional context of listed companies in the UK. Four related issues are addressed: the nature of the current problems of corporate governance, the role of financial reporting as a palliative for these problems, the need to regulate financial reporting if it is to fill this role, and the form which such regulation is likely to take. It is concluded that improvements in financial reporting may be a necessary condition for improved corporate governance, but they may not be sufficient. Improvements in financial reporting are likely to be facilitated by some form of regulation, because of the need to devise a standard form which will aid inter-firm comparisons. Self regulation by professional bodies has emerged as the initial method of regulation, but this is unlikely to be a permanent solution. If the professional body has monopoly power, there will be pressure for a wider form of private sector regulation, including other parties (such as users of accounts), in order to prevent abuse of monopoly power in favour of the profession. If it lacks monopoly power, the self-regulation will have inadequate enforcement power, and this will lead to calls for legal backing from the state, which will involve a degree of public regulation.

Financial reporting is an important element of the system of corporate governance, and some failures of corporate governance may therefore be due to inadequate financial reports. On the other hand, some problems of the financial reporting process (such as possible lack of auditor independence) may have their origins in deficiencies of the system of corporate governance. Thus, any consideration of how financial reporting might be improved has to have regard to the system of corporate governance within which it operates. This will determine both the appropriate form of financial report and the means (e.g. the form of regulation) by which such financial reports can best be obtained.

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This paper addresses four related issues in this area: the nature of the problems of corporate governance which are currently being debated, particularly in relation to listed companies in the UK; the role of financial reporting as a remedy or palliative for these problems; the need to regulate financial reporting if it is to fulfil this role; and the form which such regulation is likely to take.

Corporate governance: current concerns

The appointment of the Cadbury Committee on corporate governance, which published two reports in 1992 (an interim report in May and a final report in December), is symptomatic of the current concern about corporate governance in the UK. The related issues of corporate reporting and auditing have been considered, respectively, by the Dearing Report (1988), which led to the foundation of the Accounting Standards Board (ASB), and by the Consultative Committee of Accounting Bodies (CCAB) (1991) in its decision to create the Auditing Practices Board (APB). These developments are all related by a common concern as to the adequacy of the provision of financial information as part of the wider system of corporate governance.

There have been at least four separate themes in recent concerns about corporate governance:

(1) *Creative accounting.* The obvious increase in the use and variety of creative accounting methods in the 1980s (e.g. Griffiths, 1986) reinforced these anxieties about the effectiveness of shareholders and their stock market behaviour as a medium of corporate governance. Clearly, managements were going to considerable expense to represent performance as measured by the accounts in an unduly favourable light. This suggested either that shareholders could be fooled by creative accounting or that directors thought wrongly that they could be fooled.[1] In either case, there would seem to be some failure in the shareholders' capacity to monitor directors.

(2) *Business failures.* The public imagination is often stimulated by particular *causes célèbres,* and there have been a number recently which have suggested failure of corporate governance, and have involved associated criticism of auditing and accounting practices. These include the business failures of Polly Peck, the Bank of Credit and Commerce International (BCCI), and the Maxwell companies. They have served as a focus for wider criticisms of the system of corporate governance, although it is not clear that any system will or should prevent business failures in a recession, or that it is possible to provide a guarantee against fraud (which has been alleged in two of these cases).

[1]Strictly, this applies only to creative accounting which involves form of presentation rather than disclosure of substance. However, much creative accounting is of the former type, and should therefore be 'seen through' by a semi-strong efficient market. It is also possible that readers of accounts filter data by general rule of thumb adjustments, e.g. to allow for the fact that earnings per share are generally inflated in the UK relative to the USA. However, such general rules cannot identify the extent of the bias in individual cases.

(3) *Directors' pay.* The rapid increase in directors' pay, associated particularly with the expansion of stock option schemes on a rising stock market in the mid-1980s, gave rise to considerable concern that directors were able to increase their own pay at the expense of shareholders, and without any obvious constraint.[2] This concern was reinforced by the very large pay increases accruing to senior managers and directors when former state-owned corporations were privatised.

(4) *Short-termism.* It is often alleged that British industry fails to invest for the long term, and this is attributed to the short-term pressures on management imposed by the stock market. These are believed to include an undue emphasis on the short-term performance of companies, a failure of which can lead to opportunistic take-overs. The reliability of stock market values as an indicator of the underlying profit potential of firms was brought into question particularly by the stock market crash of October 1987, although there is also an accumulating empirical literature on failures of stock market efficiency, and a theoretical literature on the limitations of informationally efficient markets.

The above four themes may be described at best as symptomatic rather than systemic, i.e. they may be signs that the system is not working well, but they do not identify the fundamental problems of the system. In order to identify such problems, we need to examine the system itself.

The system of corporate governance

The system of corporate governance which is considered here is that currently existing in large listed companies in the UK. More broadly, it may be defined as the Anglo-Saxon model, because similar forms exist in many English-speaking countries, such as the USA, Australia, New Zealand and Canada. We shall focus on the relationship between providers of finance and management, and constraints imposed by government, through taxes and regulations, will be ignored.

The essence of this system, which is summarised in Figure 1, is that the shareholders are the ultimate proprietors of the business, who have the power to appoint and monitor the directors and the right to share in the residual earnings stream of the business by

[2]Egginton, Forker and Tippett (1989) propose an alternative method of awarding stock options which would relate reward more closely to performance.

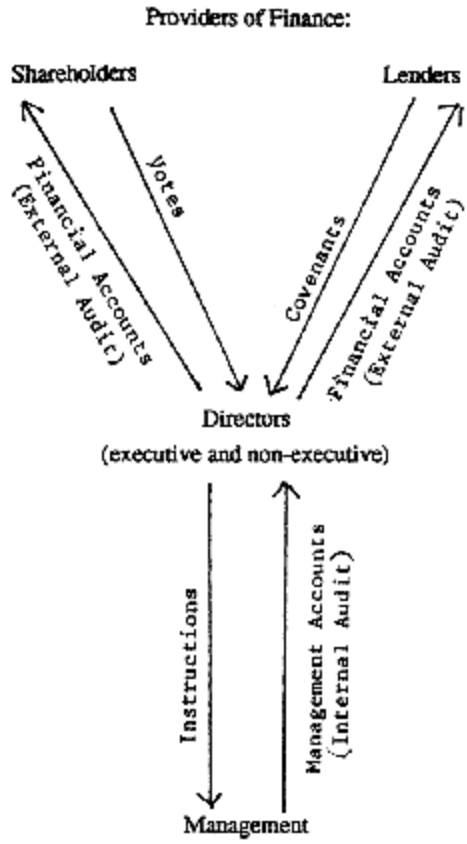

Figure 1

A schematic view of the UK system of corporate governance

receiving dividends. Providers of loan capital do not have these rights and powers, but they can constrain the actions of directors through loan covenants (which, if violated, can lead to serious restraints on management; Citron (1992) provides recent evidence on loan covenants in the UK) and they have a right to specified interest and capital redemption payments. In recent years, the distinction between loan stocks and shares has become less clear as the result of the evolution of complex securities such as convertibles which have some equity and some loan characteristics.

In order to monitor directors, shareholders and, to a lesser extent, providers of loan capital need information, there being a fundamental asymmetry of information between the directors, who have access to management information, and providers of finance who are external to the company. Financial accounts are a means of relieving this asymmetry,

by providing reports from the directors to providers of finance, and the external audit process provides an independent check on the quality of these reports, thus limiting the effects of the moral hazard problem to which directors might be susceptible. A further monitoring device to control executive directors is the existence of a strong, independent group of non-executive directors (as proposed in the Cadbury code), or alternatively a two-tier board of directors such as exists in large companies in the Netherlands and Germany.

Directors, in turn, have to monitor management, and some management accounts serve this process by passing information from managers to directors, as well as being a basis for decision making and rewarding managers. The management accounts, in turn, are often validated by a process of internal audit. In a highly devolved management structure, such as that of certain conglomerates, the role of the central board of directors in relation to subsidiaries becomes more like the relationship between shareholders and directors, being confined to assessing broad financial targets, although control is unlikely to become so loose or to be based upon such restricted data as the financial accounts.

Systemic problems of corporate governance

We can now address more precisely the fundamental, or systemic, problems of corporate governance which underlie the symptomatic problems described earlier.

(1) *Supply of accounting information.* Financial accounts form a crucial link in enabling providers of finance to monitor directors. Imperfections in the financial reporting process will therefore cause imperfections in the effectiveness of the system of corporate governance. The existence of creative accounting is evidence that financial reporting may not be fulfilling its role correctly. This should, ideally, be corrected by the working of the external auditing process, but lack of auditor independence may prevent this. Thus, the recent criticisms of financial accounting and auditing are closely linked to the issue of corporate governance, and it is therefore not surprising that accountancy bodies were involved in the setting up of the Cadbury Committee.

(2) *Demand for information.* The supply of good information will not prevent a failure of monitoring by shareholders, if the shareholders fail to use the information. A barrier to shareholders using information is the cost of processing it. Particularly for the small shareholder, such costs may be large relative to the prospective benefits. The traditional answer to this problem has been the semi-strong form of the Efficient Markets Hypothesis (EMH), which suggests that the small shareholder will free-ride on the sophisticated judgments of larger professional investors in evaluating publicly available information. However, this does rely on the assumption that the EMH holds, and there is an expanding empirical literature on apparent departures from it.[3] Moreover, the EMH refers only to informational efficiency, not to fundamental efficiency (i.e. the market's ability to assess the future cash flows and other fundamental features of a firm's economic performance), whereas good corporate governance, from the perspective of the

[3]Seminal studies in this area include Basu (1977), Shiller (1981) and De Bondt and Thaler (1985). Dimson (1988) includes some recent evidence from the UK.

whole economy, should preferably refer to the fundamentals of the firm.[4] Hence, the EMH does not preclude possible problems such as short-termism.

(3) *Monitoring costs.* Apart from information processing costs, shareholders might incur very significant costs in exercising their monitoring function, particularly where shareholdings are diffuse. In order to influence the directors, the shareholders must combine with others to form a significant voting group which can pose a real threat of carrying resolutions or appointing directors at a general meeting. The costs of combining in this way might well be prohibitive relative to the benefits. There are two possible solutions to this problem within the present system of corporate governance.

Firstly, large institutional shareholders may combine, formally or informally, to exert control on directors by the exercise of block voting power. This is analogous to the protection which such investors can give to the small investor through their information processing activities, if they make the market efficient. In some systems of corporate governance, such as that in Germany, the voting power of small shareholders can be pooled by banks who hold proxies and exert a similar discipline on directors through their power to elect members of the supervisory board.[5] In the UK, current institutional arrangements for pooling shareholder voting power are weak and informal.

Secondly, the take-over mechanism can give shareholders the opportunity to exercise their voting power in the decision as to whether to accept a hostile bid. This has long been a theme in the Anglo-American literature on corporate governance (e.g. Marris, 1963), and hostile take-overs have been an important activity in both the USA and the UK in the past thirty years. However, the take-over mechanism is a somewhat blunt instrument. The threat of take-over to be effective requires a well-informed prospective bidder, and sufficient under-performance by management to justify the costs and risks of a bid. Moreover, many empirical studies have questioned the effectiveness of take-overs in bringing better returns to shareholders of the combined group. Directors may be tempted to make take-over bids for defensive or other self-interested motives, since typically they are not required to consult their shareholders before making a bid. This may explain why the typical take-over appears in the short-term to benefit the shareholders of the taken-over company (who do have the option of rejecting the bid) rather than those of the bidding company (Davidson, 1985). There is a growing body of evidence that mergers do not improve the economic performance of the combined group. An early UK study by Meeks (1977) showed that the post-merger profitability of groups

[4]The classic statement of this argument is Keynes (1936), pp. 150–64. More recent statements, in the context of the EMH, are Whittington (1978) and Summers (1986).

[5]Cable (1985) provides a statement of this view of the role of German banks. Edwards and Fisher (1991), provide a thorough review of the empirical evidence. They conclude that there is some evidence in favour of this view but that it ‘cannot be acepted without qualification’. For example, they cast doubt on the effectiveness of supervisory boards.

did not compare favourably with pre-merger profitability, and there have been many studies of the effect of mergers on shareholder returns. Roll (1986) surveyed empirical findings for the US and concluded that the evidence was consistent with a 'Hubris' hypothesis: that bidders typically pay excessive amounts for take-overs. A recent survey of the empirical evidence on effects of take-overs in the UK concludes that:

> Takeover, or the threat of it, as a disciplinary stock market device leaves a lot to be desired. … The disciplinarians are bigger and faster growing but not on average more profitable, and their shareholders gain little or even lose as a result of their companies' acquisitions. The shareholders of acquired companies on the other hand make windfall gains that on average have no counterpart in improved resource use or corporate profitability. (Hughes, 1991).

The contribution of financial reporting

If the above analysis is accepted as an account of the current system of corporate governance for listed companies in the UK, we can interpret both the role of financial reporting and its potential contribution to improving corporate governance. We can also observe how the problems of financial reporting are in some respects a product of the system of corporate governance.

Financial reporting, as defined in Figure 1, is a crucial element which is *necessary* for the corporate governance system to function effectively. Without good financial accounting information, providers of finance cannot monitor directors' performance effectively (and equally, without good management accounting information, directors cannot carry out their monitoring and decision-making functions effectively). However, we have already seen that the provision of good financial reporting information is not a *sufficient* condition for the effectiveness of corporate governance: in terms of the earlier discussion, an adequate supply of information will not be effective if there are problems on the demand side (users do not process it), or if the informed user is unable to exercise a monitoring role (due to high monitoring costs). Thus, whilst improved financial reporting might play a role in the improvement of corporate governance, it cannot guarantee it and is certainly not a panacea.

In the remainder of this paper, we shall consider the current problems of financial reporting, why they may need to be dealt with by regulation, and the form which such regulation might take. These problems are considered within the context of the system of corporate governance, because it is that which defines the nature of the problem. However, it is important to emphasise that alleviating the problems of financial reporting does not represent a complete cure for the difficulties of the underlying corporate governance system. This would involve addressing additional issues to that of the supply of accounting information.

Current problems of financial reporting

The issues in financial reporting which are regarded as 'problems' are well known and have been discussed in a previous paper (Tweedie and Whittington, 1990). Essentially, current accounting practice allows a degree of choice of method in determining the method of measurement, criteria for recognition, and even the definition of the accounting entity, on which financial reports are based. The exercise of this choice to improve the apparent performance and state of a business is popularly known as creative accounting. Its targets are often one of two variables, earnings per share (a crucial ingredient of the Price/Earnings ratio used widely by investment analysts) and the gearing ratio (the ratio of Debt to Equity, often used as a measure of financial solvency, widely believed to be relevant to lending decisions, and sometimes incorporated in debt covenants). Its techniques are many and varied, but they include off-balance sheet financing, the use of complex capital instruments, and several different aspects of accounting for mergers and acquisitions.

Insofar as creative accounting imposes extra information processing costs on users and, in the extreme, involves non-disclosure of information, it can contribute to the problems of both the supply and the demand for accounting information which were discussed earlier in the context of corporate governance. However, before we can conclude that the correct remedy for this is the imposition of accounting standards by means of regulation, we must address the question of whether creative accounting is the result of a market failure, or whether it is a correct response to the current conditions of supply and demand in the market for accounting regulation.

The free market solution, and its limitations

The free market view of the provision of accounting information, as proposed, for example, by members of the Rochester School (e.g. Watts and Zimmerman, 1986), emphasises the role of *contracting* between providers of finance and corporate management (represented in our model by the directors). It is argued that companies would not be able to raise capital, or would have to do so on extremely unfavourable terms, if they did not offer contractual terms which would enable providers of finance to monitor performance to insure against incompetence or dishonesty by management. Part of such terms will be provision for the supply of financial information and its audit. Free competitive contracting between the parties should mean that the information is well designed for its purpose and that the quantity is optimal in terms of the cost/benefit trade-off. The same considerations would apply to the *audit* function, which provides a necessary independent check on the quality of financial reports, and therefore ensures that the terms of the information contract are fulfilled *ex post*. Another important *ex post* check on management in this framework is provided by the EMH, which implies, in its semi-strong form, that the market 'sees through' any creative accounting which affects the form of presentation. If the EMH holds in its strong form, then all available

information, including insider information which is not disclosed in the accounts, is reflected in stock market prices.

The obstacles to the free market model working in practice are as follows:

(1) *Contracting costs.* The difficulty of shareholders combining to produce a common policy, where holdings are diversified, has already been referred to. Since accounts are addressed to a wider audience, the problems of satisfying all users are even more complex, even if (as in the contracting model) we confine attention to providers of finance. There would also be considerable costs on individual providers of finance in appraising the details of the contract. However, the biggest difficulty of all is that *comparability* of accounts across companies is widely regarded as a desirable property of accounting information, since much financial analysis takes the form of comparing an individual company's performance with that of groups of similar companies.[6] Thus it is not within the individual company's power, in isolation from others, to determine its optimal accounting policy. Moreover, many of the benefits of comparability are *external* to the individual company, accruing to potential shareholders or shareholders of other companies. This leads us inevitably to the need for a *standard contract* for the provision of accounting information. Accounting and auditing standards may be regarded as part of such a contract, and they may also be regarded as products of regulation. However, we shall discuss later the form of regulation, which need not necessarily be *public* regulation.

(2) *Problems of ex post implementation.* After the finance has been raised on the promise of *ex ante* contractual terms, the directors who have raised the finance may have strong incentives not to fulfil the contract with respect to provision of accounting information, since this will loosen the monitoring constraints on them. In the case of information, the incentive is particularly strong, because it is the nature of misleading information that the recipient is misled and the provider of information is not found out.

This problem is compounded if, as suggested earlier, shareholders have high information processing costs and therefore do not apply the effort necessary to 'see through' some forms of misrepresentation. If the EMH holds, such shareholders are able to free-ride on the efforts of more discriminating shareholders. However, it has already been noted that there is accumulating empirical evidence that the EMH does not hold, and furthermore that even if it did hold, this would not guarantee efficiency in the 'fundamental' sense which would be necessary for monitoring the efficiency and effectiveness of management.

There remains the possibility that the auditor might save the situation by ensuring the *ex post* implementation of the accounting information contract. Unfortunately, in practice, there have been obstacles to the independence of auditors. Directors usually have a significant influence on auditors' remuneration, both in directly determining audit fees and in awarding additional work for consultancy and tax advice. Directors also have a decisive influence on the appointment of auditors, given the shareholders' lack of information on the quality of the audit and their general difficulties in organising voting blocks. Furthermore, the co-operation of the directors can make the audit process much

[6]The Solomons Report (Solomons, 1989, p. 6) emphasises the importance of comparability as a justification for accounting standards.

cheaper, and the directors (through management letters and other means) are the main recipients of information arising from the audit, whereas shareholders receive only a brief, stylised, single paragraph report. It is therefore not surprising that auditors often refer (wrongly) to the directors of the company as 'the client', whereas legally the client is the body of shareholders who formally elect the auditors and to whom the audit report is addressed. All this takes place against the background of a highly competitive auditing market, in which opinion shopping and low-balling on audit fees may add to auditors' feelings of insecurity. Thus, it may be questioned whether auditing, in practice, currently fulfils the idealised role ascribed to it in contracting theory. A possible remedy for this situation is to change the auditors' relationship with directors (e.g. the Cadbury Committee proposes that they should report to an audit committee of non-executive directors), and another, possibly complementary, remedy is to strengthen the professional regulation of auditors.

Forms of regulation

If the above argument is accepted, then there is a case for the regulation of both accounting (to devise the standard information contract which is needed) and auditing (to improve the *ex post* policing of the contract). Empirically, we may call upon the supporting evidence that accounting and auditing are, in fact, regulated in some form in all advanced free market economies, and that this system seems to have wide support from accountants, auditors and users of accounting information (although individuals will obviously complain about individual instances of regulation which have an adverse effect on their own interests).

An important issue which we have not addressed is, however, the form of regulation. Typically, the oldest and most pervasive form of regulation is *self-regulation*, by accountants, auditors or other preparers of financial information. This has typically been done by professional bodies, in the interests of facilitating the work of their members. An example is the series of Recommendations on Accounting Principles published by the Institute of Chartered Accountants in England and Wales (ICAEW) long before there were any formal accounting standards.[7] These can be interpreted as attempts to devise a standard service contract which members of the profession would follow, thus improving the quality of their product (by improving the comparability and content of financial statements). The regulation of auditing in the UK also developed from the activities of a

[7] Zeff (1972), pp. 308–10, discusses the origins of the Recommendations and their counterparts in the USA, Canada and Mexico. He suggests that the prospect of government intervention was probably a factor in the USA, Canada and Mexico, but not in the UK, where the ICAEW's initiative can be explained in terms of the demand for a more standardised accounting product, as suggested here. Zeff cites the pressure from accountants in industry and commerce. He also points out that the Scottish Institute objected in principle to official guidance, but that its members were able to make unofficial use of the ICAEW Recommendations.

professional body (the Auditing Practices Committee, APC, of the ICAEW), and is still sponsored by a group of professional bodies (the members of the CCAB), as was the Accounting Standards Committee, ASC, (1970 to 1990).

It seems likely that critics of regulation who take the free contracting view would not object to selfregulation *per se:* their main target seems to be public sector regulation (e.g. see Watts and Zimmerman, 1986, chapter 10). However, there seems, historically, to have been a tendency for self-regulation to develop towards public sector regulation or more broadly-based private sector regulation or a combination of the two. For example, in the UK, the loose self-regulation of the ICAEW's Recommendations was replaced, in 1970, by the Accounting Standards Steering Committee, a more formal body which exposed its views to public comment by all interested parties, including those outside the accountancy profession. As this developed (re-styled as the Accounting Standards Committee, ASC), it gained the support of all leading professional bodies (through the Consultative Committee of Accountancy Bodies, CCAB) and also widened its membership to include more non-accountants, i.e. it became more broadly based, but still in the private sector. Finally, following the Dearing Report (1988), and the 1989 Companies Act, it was replaced by the Accounting Standards Board (ASB) in 1990. The ASB has an even broader base, through its sponsorship and supervision by the Financial Reporting Council (FRC), which represents a wide range of interests in addition to accountancy bodies. The ASB also has a degree of government backing, through the legal authority of the 1989 Companies Act and through some government funding.[8]

In the USA, government backing for accounting standards came much earlier. The Securities and Exchange Commission (SEC) was established in 1934, with authority to set accounting standards for companies whose stock or shares were publicly traded. At first the SEC delegated most of this work to a committee of the American Institute of Certified Public Accountants (AICPA) (effectively a form of self-regulation), and later (in 1959) this was re-constituted (partly as a result of SEC pressure) as the Accounting Principles Board (APB), which had more support staff and better representation of users of accounts, and might therefore be described as being more broadly based. In 1973 (again with SEC support) the APB was replaced by the Financial Accounting Standards Board (FASB) which is more broadly based, being a separate entity from the AICPA and drawing its sponsorship from a variety of sources. Thus, the USA, like the UK, has seen a move from self-regulation to more broadly-based private sector regulation, and a degree of government backing for standard-setting has developed in both countries. Similar elements can be observed in the development of accounting standard-setting in the other English-speaking countries, which have similar systems of corporate governance and therefore similar roles for financial reporting, although the precise form and sequence of events varies according to the historical and institutional setting. For example, accounting standard setting has a degree of government backing in both Australia and Canada. In New Zealand and South Africa, on the other hand, accounting standards still rely on the professional bodies for their authority.

In order to understand this process, we have to consider two important potential problems of self-regulation. These are enforcement and independence. We shall argue

[8]Turley (1992) provides a review of the new standard-setting framework.

below that enforcement powers are necessary for an effective standard-setting process. These can be obtained in two ways. A self-regulatory body can enforce standards if it has monopoly power over the provision of the relevant services, so that it can exclude (by deregistration) providers of sub-standard services. However, monopoly power will lead to calls from other interested parties (such as users of the service) for a broader range of interests to be represented in the standard-setting process. This will lead to self-regulation being replaced by more broadly-based private sector regulation which has greater independence from the group being regulated. Alternatively, if the self-regulatory body does not have sufficient monopoly power to enforce standards, it will be ineffective, and those who have an interest in the standardisation of the service will seek government backing for regulation.

(1) *Enforcement.* Members of a profession may be willing to subscribe to a voluntary code, but there will be occasions when following the code conflicts with their own interests, and they will be tempted to break the code in practice, whilst subscribing to the broad principle. In the case of accounting standards, for instance, members of the profession may be tempted to free-ride on the good behaviour of others in creating confidence in accounts: an ideal situation for the selfish individual may be that accounts in general have high credibility because others follow standards, but the individual does not follow standards and thus gains undeserved credibility at the expense of others.

Thus, some form of enforcement is required. This can be done by two means. Firstly, *professional discipline* and secondly *legal backing*. Professional discipline will only be effective against the selfish individual if it has the power to penalise, and this in turn implies a degree *of monopoly power* by the profession. If the profession ultimately has the power and the will to stop the individual from practising if the professional code is violated, this is a potentially powerful incentive for enforcement. If the individual can join another competing professional body or does not require membership of a professional body, then the profession lacks a strong sanction. In this case it will have to turn to *legal backing* for enforcement and this will drive it towards a form *of public sector regulation*, since the state will not usually give legal backing without retaining some control over the exercise of the power.

In the UK, it is notable that the ASC, which dealt with accounting standards which apply to preparers of accounts, whose employment is not conditional upon membership of a professional body,[9] has been replaced by the ASB, which has a degree of legal backing. The Auditing Practices Committee (APC), on the other hand, dealt specifically with auditors, who have to be members of CCAB professional bodies in order to engage in public practice, and neither it nor its successor, the Auditing Practices Board (APB),

[9]Thus, the ASC's principal enforcement power was that of the CCAB member institutes to require auditors to qualify their audit reports in the case of departure from standards, because the directors could not be required to follow the standards in preparing their accounts. Unfortunately, audit qualifications did not prove to be a powerful weapon, notably in the case of SSAP16 (current cost accounting) in which a note of non-compliance became a routine feature of audit reports (a strict qualification of the audit report was not required for departure from the SSAP16 supplementary disclosures).

have required legal backing.[10] It is also important to note the role of the CCAB in professional standard enforcement. The professional bodies acting in concert can ensure that all professional auditors (with minor exceptions) are covered by the same discipline so that there is no question of 'opinion shopping' between professional bodies, which might undermine standards set by individual bodies.

(2) *Independence.* This, the second problem of self-regulation, is in a sense the mirror image of the first, because it is most likely to be a serious problem when the self-regulating body has a monopoly. It has long been recognised that members of the same trade or profession combining together can lead to 'a conspiracy against the public' (Adam Smith, 1776). Thus, advocates of the free market approach would be opposed to self-regulation which amounted to the exercise of monopoly power in the interest of the regulators. Similar opposition would come from those who believe that regulation should serve a wider public interest. Recent criticisms of the working of the APC in the UK (e.g. Sikka, Willmott and Lowe, 1989) can be interpreted in this way. For example, it may seem that auditing standards have been designed to limit the liability of auditors rather than serving the needs of users of financial statements (Singleton-Green, 1990).

There are two possible remedies for this problem. The more radical remedy is public sector regulation. The less radical one is broad *private sector regulation,* i.e. the regulated group itself delegates the regulatory functioning to a body which includes users of the service and other representatives of the broader public interest, so that the narrow interests of the regulated groups no longer predominate. The replacement of the APC by the APB can be regarded as being of this type: the APB has many more non-auditor members, representing wider interests than those of the auditing profession. The Take-over Panel, which regulates the conduct of take-over bids, is another successful example of private sector regulation in a related area. This uses the disciplinary power of the Stock Exchange, derived from the ultimate power to suspend the listing of a share, although the Panel represents a wide range of City interests. The Stock Exchange could also provide a disciplinary basis for the closer regulation of financial reports of listed companies, but it has shown little interest in extending its activities in this direction.

Summary and conclusion

This paper has examined the current system of corporate governance of UK listed companies and attempted a diagnosis of its main problems. Accounting plays an important role in the system, and improved financial accounting would provide a basis for improved monitoring of directors by providers of finance. However, improved accounting is not a panacea for more effective corporate governance: this would depend on addressing additionally the other deficiencies which were identified in the system.

[10]Moonitz (1974) is associated with the view that audit regulation is appropriately the province of self-regulation, whereas accounting raises broader public interest issues which require a more broadly based regulatory body. His view is founded on the belief that auditing is a technical matter, which is of limited interest to non-professionals and difficult for them to understand. Recent criticisms of auditing in the UK, and the creation of the APB, which is more broadly based than its predecessor, suggest that these conditions may no longer hold.

The discussion then turned to the current deficiencies of financial accounting, and why these might require to be dealt with by some form of regulation. The need for regulation arises from the need for a standard form of financial reporting which will facilitate inter-firm comparisons. The high individual costs and diffused benefits of devising such a standard form mean that it is unlikely to be provided without a common regulatory agency. Finally, the forms of regulation were discussed. Self-regulation was seen as involving problems of enforcement (particularly if the self-regulatory body does not have monopoly power) and independence (particularly where the self-regulatory body does have monopoly power). In the former case the consequence would be a move towards legal enforcement powers, and therefore to a degree of public sector influence (as in the case of the ASB). In the latter case, a more broadly based private sector regulatory body (such as the APB) would be a natural development.

The main conclusion is therefore that regulation is a natural consequence of the underlying features of the market for accounting information, which are, in turn, determined by the system of corporate governance. The precise form of regulation also should arise from the characteristics of the underlying market for professional services, but self-regulation is unlikely to be more than a transitory stage in the evolution of regulation. Enforcement powers are necessary for successful regulation, in order to prevent free-riders from exploiting the good reputation built up by those who conform with the regulation. The regulatory authority will either seek such powers from the state (public sector regulation) or it will have monopoly power over the provision of some relevant service (as in the case of the audit monopoly shared by professional bodies). In the latter case, there is a danger of abuse of monopoly power in the interest of the self-regulator (as some have suggested in the case of auditing) and this will lead either to public regulation (as some expect in the case of auditing) or to a broader private sector in which wider interests are represented on the regulatory body (as in the case of the UK's recently created Auditing Practices Board).

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The harmonization of accounting within the EU

Problems, perspectives and strategies

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ABSTRACT

The central concern of this paper is the international harmonization of financial accounting standards, and, in particular, the respective roles in this process of the EU, the IASC and national standard setters. The institutional framework, historical background and current achievements of accounting regulation by both the EU and the IASC are surveyed and compared. Current and prospective developments are identified, and it is suggested that a critical phase has now been reached in the relationship between the two bodies. The role of national standard-setting bodies is also considered, and the two authors offer their individual views on the problems of international accounting harmonization from the perspectives of their own countries, Sweden and the UK respectively. The paper concludes with a discussion of policies which may enable the national and international standard setters to work in a mutually supportive rather than a competitive manner.

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INTRODUCTION

Financial accounting is a means of communicating financial information from the directors of companies to users of such information who are external to the management processes of the company, and who therefore do not have access to the internal management information system. Thus, accounting is an important language of commerce. Like all languages, its effectiveness as a means of communication is aided by precise definition of words and rules as to its structure. Moreover, users' costs may be reduced, and the value of the data for comparative purposes enhanced, if all companies use the same definitions and rules in their financial reports. Efforts to achieve this on a national level, by means of company law or the regulatory activities of professional and other bodies, are often referred to as *standardization*, the rules being referred to as accounting standards. National accounting standards may, and typically do, differ, and this creates potential difficulties for users of accounts who need to compare the financial information of companies based in different countries, and for companies which wish to engage in cross-border activities, such as raising finance in more than one country. Thus, there have been pressures to bring the accounting standards of different countries into closer harmony with one another. This process will be referred to as *harmonization*. The limiting case of this process is a state of *international standardization* in which all countries share identical accounting standards. However, it should be noted that standardization may eliminate unnecessary ambiguity but is unlikely to lead to uniformity of accounting practices: the variety of business circumstances and possible methods of describing them means that a degree of choice will always be allowed by standards. Moreover, the practical application of a particular accounting method often involves an element of judgement which means that even uniform methods will not necessarily lead to uniform results.

This paper is primarily concerned with the process of harmonization of financial accounting within the European Union (EU), but this necessarily raises questions relating to harmonization within the wider world community. It is a fundamental objective of the EU that a common economic market be achieved which allows free mobility of capital, labour and enterprise, as well as trade, across the borders between member countries. This requires that the infrastructure of markets be harmonized, and financial accounting is a part of that infrastructure. The free flow of financial information resulting from the harmonization of accounting practice is thus one necessary condition for achieving a common market. However, the development of global capital markets has created another force for the international harmonization of accounting amongst the companies whose shares are traded on those markets and who have to satisfy the information needs of investors in different countries. This second force is in one sense broader, because it extends across the world from the Far East to the USA rather than being confined to part of Europe, but it is in another sense narrower, because it is confined substantially to a limited number of international corporations whose securities are dealt with in global markets.

The latter force has provided substantial support for the work of the International Accounting Standards Committee (IASC),[1] whereas the former is expressed at present through the EC Directives. The IASC standards are essentially voluntary in nature, relying for their implementation on the economic or political motivation of national

bodies and their constituencies, whereas the EC Directives have legal force and are enforceable by the European Court of Justice.[2] A possible alternative to harmonization of accounting practice by the IASC or the EU might he a process of recognition or mutual recognition,[3] which would imply that the relevant authorities in a group of countries agree to recognize accounts prepared in accordance with accepted practice in another country. This 'multi-lingual' approach to accounting might seem to offer an attractive alternative route whereby alternative systems were allowed to coexist and compete, with the possibility of a new, preferred system emerging naturally from this process. However, in practice, it seems likely that the international co-operation necessary to implement mutual recognition would be obtained only after an initial reconciliation of the basic differences between the alternative systems. Thus, a degree of harmonization may be a prelude to mutual recognition as well as a consequence of it.

In this paper, we shall consider all of these approaches to the harmonization of accounting, concentrating particularly on the perspective of the EU. We shall initially review briefly the current state of harmonization in the EU, as expressed in the directives and in the current law and practice of member countries. We shall then consider the problems which appear to exist in this process, and some recent institutional developments which may lead to future progress in harmonization. This will be followed by a review of the lASC's achievements and difficulties in international harmonization. The process of recognition, whether unilateral or mutual, and its possible contribution will then be discussed. We shall next consider whether EC Directives, IASC standards and recognition are competing alternatives or whether they might be regarded as complementary parts of a larger process of harmonization. Finally, we shall discuss the role of national standard-setters in relation to international harmonization.

THE CURRENT STATE OF HARMONIZATION OF ACCOUNTING WITHIN THE EU

The harmonization of financial accounting within the EU has been the main concern of two directives of the Council of Ministers: the Fourth Directive on the annual accounts of companies (July 1978) and the Seventh Directive on consolidated accounts (June 1983). These have been implemented in the national laws of all EU member countries and have been the focus for such harmonization as has been achieved by the EU.

The Fourth Directive

The Fourth Directive deals with the accounts of single companies, rather than groups. Its history and its content demonstrate a fundamental problem of harmonization within the EU, i.e. the diversity of legal and institutional frameworks which exist across different countries (Van Hulle, 1981). This is sometimes characterized (e.g. Nobes and Parker, 1985:5) as ranging from systems dominated by taxation considerations and by closely defined statutory prescription in company law (such as Germany and France) to systems which allow a greater freedom of choice of accounting method in order to meet the need of communicating relevant information to investors. Examples of the latter are the UK, Ireland and the Netherlands in Europe and the USA in the wider world economy. The

Fourth Directive emanated from a report (the Elmendorff Report, 1968) which was based upon the type of uniform prescriptive principles applied in Germany. However, after Denmark, the Republic of Ireland and the UK entered the Community (1973) the proposal was amended to take account of the laws of the new member states (Ernst and Whinney, 1979:9). A notable consequence of this process was the adoption of the principle that accounts should give a 'true and fair view' (Article 2 (3)), which was, of course, a central element of accounting practice in the UK and Ireland (Alexander, 1993; Nobes, 1993). However, the detailed prescriptive provisions for valuation and disclosure were retained, so that the result resembled German regulation modified by the general application of the 'true and fair' provision.

The main features of the Fourth Directive requirements are as follows:[4]

1 *Format* rules for the balance sheet (Articles 9 and 10) and the profit and loss account (Articles 23–26). These reflect the French and German traditions of detailed statutory prescription of format, but including options to meet the needs of divergent national regulation and practice.
2 *Disclosure* requirements (Article 43) which represent an averaging of existing practice within EU member countries, with options where there is a possibility of serious conflict.
3 *Valuation* rules (Articles 31–42) based upon historical cost but with alternative rules allowing current values. This right to choose current values probably reflects the fact that standard-setters in the UK and Ireland and the Netherlands were actively encouraging the adoption of current cost accounting at the time when the Directive was issued (1978).[5]
4 *The true and fair view* (Article 2) prevails over specific provisions, where circumstances justify it. These circumstances will be exceptional and may be defined by individual member states in the context of their own accounting systems.

Thus, the Directive is by nature a compromise. This is, of course, inevitable, if member countries are to work towards a common system derived from their existing practices. It does, however, raise the possibility that, by advocating the lowest common denominator of current practice with options where no common denominator could be found, the Fourth Directive was not increasing harmonization at all, but simply window-dressing existing practice. This would be an unfair interpretation, because the Directive has led to significant changes in accounting legislation in EU member countries. Indeed, the changes were implemented by three members only after the European Commission had taken legal action, and the Italian legislation to implement the Fourth Directive was as late as 1991. In all EU member countries, the implementation of the Directive has led to significant changes. In the UK, for example, detailed company account formats have been prescribed by law for the first time.[6] In certain other countries (such as Italy and Spain) there were previously no requirements in company law as to the form or content of accounts. In these countries, stock exchange requirements had set minimum standards for the accounts of listed companies, but the requirements of the Fourth Directive apply to unlisted companies as well, albeit with certain exceptions for small and medium-sized companies.

Subsequent to the implementation of the Fourth Directive, the Fédération des Experts Comptables Européens (FEE) has carried out two surveys of published accounts (1989

and 1991) to establish the extent of harmonization. The broad conclusion to emerge was that there was considerable consistency of practice across those EU member countries which had implemented the Fourth Directive, particularly in the areas in which the Directive made comprehensive prescriptions. However, this might to some extent reflect the fact that the Directive tended to be more prescriptive in those areas on which there was already considerable agreement as to best practice. The second survey (reported in FEE, 1991a, and analysed more deeply in FEE, 1992) also included the accounts of some non-EU companies and some companies in EU countries which had not, at the time of the survey (accounts for the year ending 31 December 1989) implemented the Directive. These accounts also showed considerable consistency with EU requirements, but this may have been due to the fact that they tended to be large companies and therefore subject to the common, unifying demands of capital markets and the influence of the IASC's standards. In summary, the FEE surveys provide inconclusive evidence in relation to the harmonizing effect of the Fourth Directive: a degree of harmonization has been achieved but we cannot locate its cause with any degree of accuracy. The surveys also demonstrate that there are many detailed areas, such as pension provisions, deferred taxation,[7] foreign currencies and leasing, in which the EU has not yet sought to harmonize accounting practice and within which there are significant variations of practice across EU member countries (FEE, 1991a: chs 9–11, and 13, and pp. 11–15). Thus, the Fourth Directive has achieved a unified minimum degree of regulation of accounting, which has been more effective in the areas of format and disclosure and less so in the case of measurement.

The Seventh Directive

The Fourth Directive dealt with disclosure only in the accounts of individual companies. The Seventh Directive (1983) made good this deficiency by extending the Fourth Directive requirements to the consolidated accounts of groups. It also addressed the difficult problem of identifying groups and defining which companies should be required to draw up consolidated group accounts. Finally, it dealt with questions relating to choice of method in the consolidation process.

Only two countries in the EU (the UK and Ireland) had comprehensive legal requirements for consolidated accounts at the time when the Directive was issued (Petite, 1984:82). Several countries had very broad statutory provisions for consolidated accounts, often resulting in a variety of methods being in use. It is therefore not surprising that the Seventh Directive, like the Fourth before it, was essentially a compromise between the extant practices of different member countries. Equally, it is not surprising that it offered a choice of method in many instances. The Seventh Directive, like the Fourth, offered around fifty options, some to be exercised by the member country, some by the individual firm, and some by both. For example, on the controversial issue of goodwill, the Seventh Directive allows three alternative treatments: immediate write-off against reserves, capitalization and subsequent write-off over up to five years, or capitalization and write-off over a period greater than five years but not greater than economic life (Fourth Directive, Article 37, and Seventh Directive, Article 30). Member states may choose one or more of these options in their domestic legislation. Finally, the Seventh Directive also offered exemptions from drawing up consolidated

accounts for small and medium-sized groups of companies. This was necessary in order to make implementation possible in those member countries which had not previously required consolidated accounts, although similar exemptions are also used by other member countries.

With regard to international harmonization of accounting, a feature of the Seventh Directive which may be important in relation to harmonization is the concept of equivalence (Seventh Directive, Article 11.1b). Subgroups of companies are not required to prepare group accounts if their parent is governed by the law of an EU country (and is therefore subject to the Seventh Directive), or if their parent prepares accounts in a non-EU country which are drawn up in conformity with or in a manner *equivalent* to EU requirements. The Eleventh Directive gives similar exemptions with regard to the filing of group accounts (Article 9.1). Since recognition of equivalence confers a clear benefit (a saving of disclosure costs), it provides a possible motivation for international harmonization. Member states of the EU are given the responsibility of determining criteria for recognizing equivalence, and the equivalence exemption is itself an option for the individual member state. The exemption is not implemented currently in Denmark, Italy, Spain or the UK (FEE, 1991b:14) or in Ireland and Portugal.

Other Directives

Several other EC Directives which are currently in force or in draft have an effect on accounting. Specific accounting directives are 90/604 and 90/605 which amend the scope of application of the Fourth and Seventh Directives, respectively, including exemptions for small and medium-sized companies. The Eleventh Directive (89/666) is concerned with publishing requirements for branch accounts. For banks and other financial institutions, a special directive (86/635) applies requirements similar to those of the general accounting directives. The recent insurance accounts directive (91/674) is also based on the general accounting directives (Van der Tas, 1992b).

Apart from these directives, which relate specifically to accounting, there are a number which relate to the background of accounting and the context in which it is carried out. Notable amongst these are the Eighth Directive on the qualifications of auditors and several directives in the area of financial market regulation. The latter are concerned with the access of securities to the market. They include directives on the co-ordination of listing requirements (79/279), the public offering of securities (80/390) (listing prospectuses), interim reports (82/121) and public offering prospectuses (89/298). They demonstrate that the EU's accounting requirements are part of a broader system of harmonization of financial markets and institutions. The capital market directives are all based on the concept of mutual recognition. The concept of recognition by stock exchanges is an important force for harmonization not only within the EU but also within the wider world context and considerable progress has been made in that direction (FEE, 1991b: 54–75), although, of course, it can apply only to the larger companies which are eligible for stock exchange listing.

A preliminary view of the current state of EU harmonization of accounting

The EU has undoubtedly made progress towards harmonization of accounting law. The main vehicles for this have been the Fourth and Seventh Directives. It may be disputed whether these directives have caused harmonization of accounting practice: an alternative interpretation is that they have simply codified the results of existing common practice which was the inevitable result of market forces. However, even codification of existing practice has an important role to play in developing a common language within which the discourse about harmonization can be conducted, and in consolidating what has already been achieved. Furthermore the directives have led to some changes in all member countries and to important changes in those countries which had little formal regulation of accounts in the past. Indeed, in so far as the EU's powers are those of legislation, through the directives, it may be argued that it would be inappropriate for it to attempt to regulate on a detailed level. The law lays down *minimum* requirements within which more detailed practice develops, within all existing national systems, although the balance between legal prescription and professional practice (as often incorporated in private sector accounting standards) varies. This may be because the law can be too rigid an instrument with which to regulate the details of accounting practice, which needs to respond rapidly to changing needs and circumstances, and also it is not obvious that legislators have the appropriate skills to develop new accounting practice. Thus, the EC Directives may have limited further potential for developing and harmonizing accounting practice. Such a function may be best left to national standard-setters, with the IASC as a coordinating body, although another possibility is that the EU develops a community-wide standard-setting body.

There are three aspects of the current state of the harmonization of accounting within the EU which deserve attention in future developments.

1 *Options.* Both the Fourth and the Seventh Directives contain a number of options which were necessary to meet the needs of member countries at the time when the directives were published. If the goal is true harmonization of accounting practice, options which are exercised in different ways in different countries are undesirable in the longer term. Thus it might be desirable to remove these options from the directives in the future, although the current policy of the Commission appears to be to retain the existing options (Van Hulle, 1992), and there is no mechanism available to the Commission for narrowing them without resort to the Council of Ministers. Moreover, the directives may not be the most appropriate medium for further harmonization.
2 *Gaps.* The directives fail to address certain specific issues in accounting, e.g. no provision is made for the cash flow statement, and such issues as leases or foreign currency translation are not addressed. These issues have been addressed by the IASC and by some national standard-setting bodies. The EU has not, so far, expressed any intent to legislate on those matters, although the European Accounting Advisory Forum (see below) has provided a means by which representatives from member states can discuss some of the issues, thus possibly assisting the co-ordination of the activities of national standard-setters.

3 *New developments.* The existence of gaps is symptomatic of the fact that the directives represent an attempt to harmonize accounting at the time when they were drafted. Accounting and the problems posed for it by innovative financial markets have developed rapidly in recent years. Thus, some of the gaps in the coverage of the directives are caused by developments which have taken place recently. However, we have suggested above that the filling of these gaps is not necessarily best done by means of legal directives, since the pace of new developments is such that revision of the directives may not be an effective remedy: by the time the cumbersome revision process is complete, the revisions may already be out of date. Thus, the 'setting in concrete' of current solutions to current problems by incorporating them in the directives may be counterproductive. The Commission has identified this problem and we shall later discuss some of the strategies which are currently being used in order to deal with it.

THE WORK OF THE INTERNATIONAL ACCOUNTING STANDARDS COMMITTEE

The IASC was founded in 1973 by the accountancy profession. It is now associated with the International Federation of Accountants (IFAC). Its Board comprises representatives of professional accountancy bodies in thirteen countries and up to four other organizations with an interest in financial reporting (IASC, 1991:9). Few of the constituent members have statutory backing for their own domestic standards. Moreover, many of the members are not the recognized standard-setters in their own countries, and the IASC itself relies entirely on them to implement its own standards. Thus, the IASC is essentially a co-ordinating body, which relies on the voluntary co-operation of its constituent bodies to encourage harmonization of national standards in accordance with its own standards. The constituent bodies in turn rely on the co-operation of their own constituencies to implement standards.

Despite the voluntary nature of the IASC's standards, there has been wide international support for its work, and it has been productive. The IFAC had a membership of 104 professional accounting bodies from seventy-eight countries in 1989 and by July 1990 the IASC had issued twenty-nine international standards. However, there were strong forces behind the formation of the IASC which have grown stronger since. These forces arise from the increasing internationalization of business and, in particular, the growth of international capital markets, in which there is a demand for accounting information which is comparable across companies which have different countries of origin. This is apparent in the support which the IASC's work has received from the International Organization of Securities Commissions (IOSCO). The recognition of company accounts in the listing agreements of stock exchanges is an important factor in the pressure for harmonization: non-recognition can lead either to denial of access to the stock market or to significant additional expense being incurred in re-casting the accounts to meet the requirements of the particular stock exchange. By encouraging its member stock exchanges to recognize international accounting standards and by advising the IASC on which standards are likely to be most acceptable for this purpose, the IOSCO plays an important part in making IASC standards effective.

Other international organizations have also shown an interest in and support for the work of the IASC. The interests of these organizations go beyond companies listed on stock exchanges and extend to a broader interest in free trade at all levels of economic activity, as is the case of the EC Commission. The organizations include the OECD (Organization for Economic Co-operation and Development), which comments on IASC exposure drafts, the countries involved in the GATT (General Agreement on Tariffs and Trade), which have recently considered supporting international accounting harmonization as part of the Uruguay Round negotiations on trade in services (GATS), and the United Nations Organization.

The development of the IASC has reflected the mobilization of these underlying forces. In its early years, described by Beresford (1992) as its 'descriptive period', the IASC issued consensus standards, which were essentially summaries of accepted practice in various countries, allowing a wide choice of method. These reflected the lack of authority behind the IASC's standards. They did provide an exchange of information, enabling national standard-setters to have a better understanding of practice elsewhere, and they were of particular value to countries which did not have any standards in place, by providing them with an instant set of minimum standards which would have a degree of international credibility.

This early phase of the IASC's work ended in 1988, when the IASC developed its Exposure Draft E32 on The Comparability of Financial Statements' (published in January 1989). This proposed to improve the international comparability of financial statements by reducing substantially the range of options contained in the IASC's standards. It was followed by the adoption of a conceptual framework ('Framework for the Preparation and Presentation of Financial Statements', July 1989) which would provide the basis for choosing between alternative accounting treatments and by a Statement of Intent (July 1990) indicating that the IASC would adopt the policy outlined in the Exposure Draft and making detailed proposals in the light of comments received.

The Statement of Intent proposed adoption of E32's detailed proposals for restricting choice on twenty-one of the twenty-nine issues which it selected. Five issues were reserved for further work, and on three issues the Statement of Intent changed E32's proposals. These were development costs, inventories and borrowing costs. On the latter two issues, the IASC subsequently reverted to the E32 proposals, following adverse comments on exposure drafts (*IASC Insight,* July 1992). In the case of inventories, E32 advocated that FIFO and weighted average cost should be benchmark treatments, with LIFO as an allowed alternative and the base stock method eliminated. The Statement of Intent and Exposure Draft E37 proposed the elimination of the LIFO alternative, but this proposal was withdrawn following opposition from the EU, Japan, user groups in the USA and the IOSCO. LIFO is permitted by the Fourth Directive of the EC and is permitted in the USA, where it is allowed for tax purposes. In the case of borrowing costs, E32 proposed expensing as the benchmark treatment, with capitalization (where appropriate criteria are met) as an alternative. The Statement of Intent and E39 changed the proposal so that capitalization would be required when the criteria were met. Following adverse comments, the IASC withdrew the latter proposal and reverted to its E32 position.

The IASC has therefore moved into a new stage in its work, described by Beresford (1992) as its 'normative period', and this may lead to greater potential conflicts between

international standards and the domestic standards of IFAC members which will lead to greater difficulty in obtaining a consensus. An important factor in this new development has been the support of the IOSCO, and the associated hope that international standards will become the basis of stock exchange listing requirements in many countries. This would, of course, encourage compliance by listed companies, but unlisted companies may be less amenable to the adoption of international rather than domestic standards. Moreover, even the IOSCO's support wavered when it 'felt that the IASC was going too far in eliminating LIFO', *(IASC Insight*, July 1992:2).

CURRENT AND PROSPECTIVE DEVELOPMENTS IN THE EUROPEAN UNION

We summarized earlier the current state of harmonization within the EU. The current problems were listed as narrowing options, filling gaps and coping with new developments. Recent pronouncements and acts by the Commission suggest that the appropriate way forward is seen to be by means other than the replacement or revision of the Fourth and Seventh Directives. This is consistent with our view that the use of directives is to lay foundations rather than provide very detailed guidance, and by their nature they are difficult and slow to change, so that they cannot provide a rapid response to newly emerging issues.

In order to provide a mechanism for the discussion of current accounting problems within the Community, the European Commission's Accounting Advisory Forum was instituted in 1991. This has representatives of standard-setting bodies in all member countries as well as other interest groups and has recently debated three issues, accounting for government grants, leasing and foreign currency translation, which are not covered by the Fourth Directive. The role of the Forum is to advise the Commission, and this will be additional to the advice which the Commission already receives from the Contact Committee, which represents national governments. It is not entirely clear how the Commission will act on the basis of the advice of the Forum.

Another possible source of future developments in EU harmonization is the new technique of *comitology* which the Council has developed (87/373/EEC Council Decision). This is a device for developing detailed technical guidance within the broad framework of policy laid down by the directives. A Comitology Committee is appointed by the Commission to deal with a particular issue and its report, if approved by the Commission, is a binding interpretation of the practical effect of the principles laid down in the directives. The Committee membership consists of representatives from member states under a Chairman appointed by the Commission. This is a recent development, and it has not yet been introduced for the existing accounting directives (although it will be provided for automatically in any new directive), but it has the potential for providing much more detailed guidance than is contained in the directives. It could not, however, eliminate any of the options which are explicitly allowed by the directives, so that it would be more relevant to filling gaps than narrowing existing options. Moreover, it is not clear that the development of detailed accounting guidance, akin to accounting standards, can be successfully carried out by a Comitology Committee of the

Commission. Accounting practice raises much wider issues than the technical interpretation of directives.

Another mechanism whereby international harmonization can be encouraged is *mutual recognition*. This implies that two or more states agree to recognize accounts prepared under each other's conventions for some purpose, such as stock exchange listing. The United States Financial Accounting Standards Board currently has a policy of fostering mutual recognition on a bilateral basis between the USA and other individual countries, such as Canada, by means of joint projects to develop compatible standards (Beresford, 1992). Such a process naturally leads to negotiation to remove any important contradictions between the two systems which are being mutually recognized.[8] It is thus the process leading to mutual recognition rather than the fact of recognition which creates harmonization and harmonization will not occur if mutual recognition is enforced without such a process taking place. However, once mutual recognition is achieved, further regulatory convergence can be expected. This process has been well described by Sydney J.Key (1989) in the content of the EU's integration of financial markets:

> In the financial sector, the Community is using the principle of mutual recognition as a pragmatic tool that, together with market forces, is expected to result in a more unified, less restrictive regulatory structure. The process is interactive: mutual recognition requires initial harmonization, and additional harmonization results from mutual recognition. In adopting the approach of mutual recognition in the financial area, the Community is in effect using trade in financial services as a lever to arbitrage the regulatory policies of the member states.
>
> (Key, 1989:604)

It should, be noted, however, that the further convergence following mutual recognition might inhibit innovation by national regulators; if the mutual recognition process could be used to circumvent national regulations, e.g. in the area of accounting, companies could choose to register in the country with the least restrictive standards.

Within the area of financial accounting, mutual recognition could take the form of all EU member states recognizing, for a particular purpose, accounts prepared in accordance with the accounting directives or some more restrictive method which closed some of the options or gaps in the directives. This is most likely to occur for the purpose of reporting requirements for companies listed on stock exchanges, although this does not apply strictly at the present time. The securities directives have already adopted the principle of mutual recognition for listing requirements and prospectuses (which include accounting data), but this does not yet extend to annual accounts filed as a continuing obligation of listing: accounts are required but their content is not specified.

Mutual recognition could also take the form of agreements between individual non-EU countries and the EU. However, greater international harmonization in conformity with the EC Directives might be achieved by the concept of *equivalence*, which arises from the consolidated accounts rules contained in the Seventh Directive and from the filing requirements of the Eleventh Directive, as described earlier. Recognition as being equivalent clearly saves significant costs of disclosure and preparation and provides an incentive for companies from non-EU countries to comply with basic EU standards and

to lobby their own governments to impose requirements consistent with those of the EU. A recent study by FEE demonstrates that current IASC standards are, with minor exceptions, consistent with the EC Directives, and recommends that IASC standards should therefore qualify as equivalent. However, compliance with the Directives does not guarantee compliance with the standards of individual EU member countries, which may exercise the discretion given by the directives to close certain options and may also deal with issues which are not at present covered by the directives.

Another possible development in the harmonization process (both inside and outside the EU) is to allow consolidated accounts to be more separated from the accounts of the individual company. There is an opening for this in the Seventh Directive (Article 29.2). This possibility is of special importance in countries with strong links between tax and financial accounting. By using, for example, other valuation methods in the consolidated accounts these accounts could be more informative and of better use in the financial markets. Such an approach could be of general importance since it offers the possibility of hastening the time-consuming harmonization process. Parent company accounts could be used as the 'legal accounts' and consolidated accounts the reports to providers of finance. Since it takes time to change accounting methods when accounting regulation is legally oriented, Article 29.2 offers the possibility of satisfying both legal and financial needs. As far as we know only France has used this Article (but it is implemented in all member states): the example which is usually quoted is the translation of foreign currency. However, it is worth mentioning that in Sweden, with a very legal and tax oriented accounting regulation regime, this separation has developed into a rather common practice among the large listed companies. An example is the new standard of the Swedish Financial Accounting Standards Council (SFASC) for consolidated accounts, in which the technique prescribed in the Accounting Act for reporting of untaxed reserves is not used in the consolidated accounts. Instead companies are recommended in these accounts to use the international standard and report deferred tax liabilities.

A study by Rundfelt of the annual accounts of listed Swedish companies for 1988 (Rundfelt, 1989, 83–8) mentions four more areas where the individual company accounts and consolidated accounts differ. One of these is accounting for goodwill, which, in Sweden, includes all associated intangible assets, such as brands. This also is treated differently in consolidated accounts, mainly because of restrictions in the accounting legislation relating to parent company accounts. The other three areas could all be explained by tax considerations. The first is valuation of foreign currency. Companies like Volvo and Ericsson used the closing rate in the consolidated accounts but the lower of cost or market in the annual accounts of the parent company. The second area is capitalization of interest in real estate companies. A number of such companies capitalized interest accruing during the construction period only in the consolidated accounts (it was expensed in the parent company accounts). The third and last area is the use of the percentage of completion method (in contracting companies) in the consolidated accounts and the completed contract method in the parent company accounts (in the case of only a few companies).

FUTURE STRATEGIES

The question of EU recognition of IASC standards brings sharply into focus one of the most important strategic questions facing the EU in the area of harmonization of accounting: should it concentrate on harmonization *within* the EU or should it also attach importance to harmonization between the EU and the rest of the world? Obviously, the main purpose of the EU is to achieve harmonization between its member states, to facilitate the creation of a common market, and the legal influence of the directives is bound to be limited to EU members and their associates (such as the EFT A countries which sign the Treaty on the European Economic Area). Nevertheless, a process of internal harmonization which increased differences between EU members and the rest of the world might be damaging to the EU's economic competitiveness in the world economy and might also seem to be contrary to the free trade principles upon which the EU was founded.

The answer to this question may depend upon whether harmonization within the EU is seen as conflicting with international harmonization. Clearly, the EU is committed to internal harmonization as part of its common market policy, and this policy applies to all sizes and types of enterprise. On the other hand, the liberalization of trade between the EU and the rest of the world is consistent with the policies of GATT and other international arrangements to which members of the EU are parties. Furthermore, the FEE study suggests that there are no serious conflicts between the current IASC standards and the EC Accounting Directives. Hence, there is no obvious conflict at present between the twin objectives of harmonization within the EU and harmonization between the EU and other countries, although, as noted earlier, there may be difficulties when member countries have exercised particular options within the directives or have extended domestic regulation to areas not yet covered by the directives. If future EU harmonization policy addresses new problems of accounting or narrows existing options, this will make differences more apparent not only between EU member countries, but also between the EU and non-EU countries.

There is also the possibility that such conflicts might arise in the future, as a consequence of the IASC taking a more restrictive attitude to alternative accounting methods. Thus, if there is to continue to be harmony between the IASC standards and the EC Directives, it is important that the EU and the IASC engage in a constant dialogue. In order for this to happen, the EU must address its own problems of internal harmonization and identify any uniquely European view of how accounting should develop. It is not clear at present that any such view exists: we have already seen that attitudes and institutions vary widely within the EU. Equally, it is not clear that it *ought* to exist, given that the pressure for international harmonization both within the EU and externally has come mainly from the increasingly international nature of capital markets and large business enterprises and is not unique to the EU. However, it is important that any unique EU view which does exist should be articulated, discussed and, if possible, reconciled with IASC proposals. This may imply the creation of a new administrative process whereby the EU formulates proposals and discusses them with the IASC so that the accounting requirements of both can be brought more closely in line with one another. If

this is achieved, the gain to the EU will not only be greater international comparability of accounting information but also a lower cost to standard-setting, because it will then be unnecessary to develop detailed EU standards to supplement the directives in areas which are dealt with by IASC standards which meet the EU's requirements and can therefore be adopted by the EU.

There is an important unresolved ambiguity, however, in this proposal for international harmonization through co-operation with the IASC. This is the role of national standard-setters. The IASC, in its pre-E32 period, has aimed to provide *minimum* standards,[9] and this minimum approach also applies to the EC Directives, which allow member states freedom to allow choice or restrict it in many cases. If a recognition process allows minimal IASC or EU standards, or both, to satisfy regulatory requirements, there may be little incentive to improve local standards: this will merely disadvantage local companies which must bear the compliance costs, or, as suggested earlier in the discussion of mutual recognition, local standards may be circumvented by registration in countries which have lower standards. On the other hand, bodies like the IASC and the EU have, in the past, gained most of their ideas and practical evidence from the rich diversity of national practices, and some countries (notably the USA) have set the pace as innovators. If international diversity and innovation are to be maintained, the international arrangements for standard-setting must allow and even encourage innovation, provided that it represents an elaboration of the minimum standard of disclosure required by IASC or EU standards. This implies that full recognition might not always be appropriate when the requirements of countries are not, in fact, equivalent.

This line of reasoning leads us to some fundamental issues in accounting standard-setting and harmonization. We would suggest that national standard-setting in all of the member countries of the EU and the IASC has the following characteristics.

(1) *No country has a completely satisfactory system of national accounting standards.* The *coverage* of standards is incomplete, and this situation is likely to persist given the continuous arrival of new problems. Hence there will be need for continuous innovation. Equally, there are problems of *compliance* with accounting standards. These arise from the natural incentives of preparers of accounts to present their own situation in the most favourable light. In dealing with this problem, a balance has to be struck between legal rules, which can be effective in enforcement but rigid in application, and self-regulation, which is more flexible but relies on the self-discipline of individuals or groups for its enforcement.

(2) *Accounting standards and practices differ between countries and there are often good reasons for this.* Sometimes, differences may be due to accidents of history, but they are often associated with differences in the institutional setting of business enterprise which lead to users of accounts having different needs. For example, it is well known that the published accounts of German companies are used for fiscal purposes and a consequence of this has been a strict emphasis on historical costs, since reporting an increase in asset values could lead to a higher tax charge. Equally, there is less emphasis in Germany on the use of accounts by uninformed equity investors, because a large proportion of the shares of large listed companies in Germany is held through the intermediation of banks and other large companies which often have representatives on boards of directors. In the UK, on the other hand, there is much more emphasis on the importance of reporting to investors who have no other direct source of information about

the company. This reflects the greater importance of such investors in the UK. The list of national differences could be extended, but the important principle to which it points is that accounting practices have to be evaluated in their institutional settings. This suggests that, until the institutional settings are identical, it will not be possible or appropriate fully to harmonize accounting practices. Within the context of the EU, this implies that the harmonization of accounting has to be seen as a part of the wider harmonization of the structures of institutions such as companies and capital markets, and may be possible and desirable only as part of such a wider process of harmonization. We may question the wisdom of harmonizing accounts of companies which are not operating under similar rules (such as company law requirements) or under similar conditions (such as capital market requirements or tax laws).[10] We may also question the practicality of harmonizing accounts as a means of bringing about the harmonization of institutions, rather than as a component of wider efforts towards harmonization, such as the harmonization of fiscal systems or company law.

(3) *Accounting needs vary with the size and form of corporate enterprise.* This is recognized in the domestic legislation and accounting standards of many countries, and it is also a principle which has heen adopted by the EC Accounting Directives, which impose progressively lighter reporting and publication requirements on small and medium-sized enterprises. Clearly, the largest enterprises are likely to have the widest constituency of users of accounts external to the enterprise, and they incur the most onerous reporting requirements. With regard to form, companies whose stocks are listed on the public stock exchange have a wide range of potential investors who have a legitimate claim on financial information, and, for this reason, listed companies are usually regarded as those which should provide the fullest financial reports. It is these companies which tend to be the focus of international harmonization programmes, particularly that of the IASC which, as we have already seen, has been supported by the IOSCO, representing the securities markets. Within listed companies, there is a subcategory of internationally listed companies which are typically very large and which have a particularly strong interest in international harmonization. However, the EU's objective of establishing a common market, within which labour, capital and trade may flow freely across national borders without institutional obstacles, implies a commitment to the harmonization of accounts, at least at a basic level, for all sizes of company.

TWO PERSONAL VIEWS

In this section, we present the personal views of the two authors on the problems of international harmonization. These views are inevitably subjective, but they may serve to illustrate not only the individual prejudices of the authors but also the variety of perspectives which need to be reconciled if harmonization is to be achieved.

Per Thorell

This author speaks from the perspective of Sweden, and from his background as a lawyer in the field of corporate law, but also from his experience as a member of the Swedish Financial Accounting Council and expert in the Swedish Governmental Committee at

present working on implementing the EC Accounting Directives in Swedish company law.

From an international accounting perspective, Sweden has two main characteristics. In relation to the size of the country, there is a large number of big multinational companies, and many of them are listed abroad. For the last twenty years, Sweden has had accounting rules very similar to the EC Directives but, in contrast with the EU rules, this legislation covers all Swedish enterprises, whatever their legal form. (This is partly a joint Nordic company law legislation.) Therefore, it is believed that accounting standards in small and medium-sized enterprises (SME) in Sweden are relatively high.

The big Swedish multinational companies have introduced an international (investor) perspective on financial reporting, to some extent in contrast with the narrower perspective of the legislation, which is directed more to serving the needs of taxation and creditors. This has primarily been necessary because of the listing requirements of foreign stock exchanges. The US requirements have, of course, been of special importance. It is well known that a number of these companies have annual reports of high international standard. However, Swedish GAAP is at present not so well defined, and therefore some important divergencies exist between general accounting practice and the principles used by these companies. Nevertheless, the quality of the financial reporting in these multinational companies has without doubt had positive effects on the quality of the financial reporting in other listed companies. The accounting practice for listed companies has, in turn, affected accounting standards in SME.

Even before the EU implementation work started in 1990 as a consequence of a forthcoming EEA treaty, a debate started about the need for a revision of the accounting legislation. One reason for this proposed revision was the legal problems that had arisen because of the developments in international accounting. It was, and still is, rather difficult to combine these developments with the present legislation (e.g. in the areas of valuation of foreign currencies, construction contracts and investments and the use of the equity method). However, the EU implementation work intervened. Sweden now faces the problem of being forced to implement rules that are even older, and partly more old-fashioned, than the ones we were about to revise. However, there is an advantage to joint European legislation in this field, and some of the problems we had will probably be solved. But, since there are no explicit valuation rules in the directives for the problems mentioned earlier, and the general rules are formulated like the ones we already have, the directives are an obstacle to a modernized national legislation. Partly because of very strict rules and partly because of the uncertainty of their meaning in some areas, the directives stop us from supporting international developments in the legislation (e.g. allowing market valuation for certain investments). (This must now be left to standard-setters.) Because of this and the present standard of Swedish accounting, although the EC Directives will lead to many changes in the legislation they will have a very marginal effect on Swedish accounting practice!

Swedish accounting standards are, and have been for many years, affected by the IASC standards (IAS). However, in areas where taxation considerations have been especially important, there have been difficulties in developing standards that comply with IAS (e.g. leasing). The present standard-setting body (Swedish Financial Accounting Council) is focusing on the IAS even more than earlier standard-setters. The result of this will probably be even closer links with the IAS. As mentioned earlier in this

paper, Swedish companies to some extent already use the method of changing valuation in the consolidated accounts. This method will probably be used even in future standards to solve national company law and taxation interpretation problems. Article 29.2 in the Seventh Directive is very helpful here. This development means that the parent company accounts will be the legal accounts (mainly tax accounts) and the consolidated accounts will be used for financial purposes. This view makes it possible to follow IAS and at the same time comply with local company (including EU Directives) and tax rules. However, I would like to add that I see an increasing number of conflicts between desirable practice and the legislation.

Geoffrey Whittington

This author speaks from the perspective of the UK, and as an academic accountant who is involved in national standard-setting as an adviser to the Accounting Standards Board (ASB) (although these are not the official views of the Board).

The UK has a fairly complete and sophisticated set of accounting standards by comparison with many other countries, although the system is far from complete and new challenges are constantly posed by innovation in financial markets. UK standards are set within the framework of the Companies Acts which, in turn, implement the EC Directives. Thus, UK standards comply with the EU's requirements, but these legal requirements are sometimes seen as an unwelcome restraint. This may be because they reflect the problems and practices of several years ago. It follows from this that further legal constraints, as a result of tightening EU requirements, could inhibit the power of the ASB to choose what it considered to be the most appropriate standards. On the other hand, it must be recognized that other standard-setters within the EU face similar challenges (although no other EU standard-setting body has powers or resources as great as those of the ASB), and there is a need to exchange experiences and views in the hope of deriving common solutions to common problems. This process is aided by the European Commission's Accounting Advisory Forum. Equally, the mutual recognition of accounts by financial markets may provide a stimulus and incentive to the process. A similar need arises with respect to non-EU countries, particularly those which have international stock exchanges or which have strong economic relations with the UK. Harmonization with these countries is aided by compliance with IASC standards, and the ASB always takes account of these standards in making its own decisions. The process is aided further by bilateral meetings with standard-setters in other countries and by multilateral meetings such as the periodic meetings of standard-setters. Thus, ideally, international harmonization should evolve by voluntary exchanges of ideas and identification of common problems and needs. This process may be more intense at the EU level, because of the closer economic ties that are developing within the EU. However, it should not be confined to the EU, because the free trade ideals of the EU imply that it is important to liberalize trade and capital movements between the EU and the rest of the world.

This view of accounting harmonization regards the process as being essentially demand-driven, the demand arising from the needs of international business. It follows from this view that international harmonization of accounting is a much less important issue for small domestic companies which are not involved deeply in international

finance or trade.[11] Thus there will be a continuing need for accounting legislation and standards to accommodate the simpler basic needs of the smaller company, which are likely to converge internationally much more slowly than those of the large internationally listed company.

Another important role of the EU, which should not be overlooked, is to harmonize every aspect of the economic infrastructure within the Union in order to achieve a truly common market. As noted earlier, this implies harmonization of fiscal systems, company law, capital markets and other commercial institutions, as well as financial accounts. Accounting is, in fact, only one small element in the total programme and, since accounting practices reflect institutions, full standardization of accounting practice within the EU is unlikely to be feasible until institutions also conform to a common pattern. As noted above, this applies particularly to small companies, which are less subject to the pressures of international markets. Thus, accounting harmonization is constrained by the progress of other aspects of harmonization within the EU. Therefore, for the foreseeable future, there will be a useful role for national standard-setters within the EU.

However, even when the state of harmonization in the EU reaches a level at which a common set of EU accounting standards is appropriate, there will be a need for flexibility and adaptability to changes in the economic and institutional environment. Thus, the law will always be a cumbersome device for dealing with accounting problems, and the legal requirements of the EC Directives will need to be supplemented by the work of an accounting standard-setting body.

CONCLUSION

Our conclusion from the above analysis is that international harmonization of accounting standards is reaching a critical phase in which attempts are being made to narrow international differences, rather than merely recording them. We have identified two important interfaces between accounting standard-setting bodies. First, on the international level, the relationship of the IASC to the EU has, to date, led to no substantial conflict, but this may not be the case when we consider individual member countries of the EU, which offer a narrower range of options, and the situation may, in any case, be about to change as both the IASC and the EU attempt to narrow accounting choice within their respective constituencies. Co-ordination rather than conflict is the desirable future relationship between these bodies. Second, we have discussed the problem of national standard-setters and their relationship with international harmonization efforts. It is important that national standard-setters retain a degree of autonomy, for two reasons. First, they provide a source of innovation and adaptation to new problems, which may first emerge on a national level. Second, they provide for the specific national characteristics of accounting which arise from the institutional setting. Accounting harmonization may be a necessary aspect of harmonizing institutions, but it is not clear that harmonizing accounting *in advance of* institutions is likely to lead to good accounting or to bring about the future harmonization of institutions. The greatest forces for international harmonization are found at the level of companies listed on stock exchanges, particularly those which are internationally listed. In the case of such companies, the existing institutional framework offers clear benefits to the international

harmonization of accounting, and it may be that international standard-setters should focus their efforts more explicitly on this sector.

Thus, our view of international harmonization of accounting is that, at present, it offers only the prospect of providing *minimum* standards and of co-ordinating the efforts of national standard-setting bodies. Until the underlying institutions are fully harmonized, we cannot expect accounting to be harmonized, because the benefits would be doubtful. We have suggested that the benefits are greater for listed companies, and the lASC's efforts, supported by the IOSCO, are suited to meeting the needs of this group, although the IASC has retained the universality principle that standards should generally apply to all companies (except where specific exemptions are given). This is not to say that the IASC is ideally constituted for its purpose: the absence of representatives of national standard-setters may inhibit its ability to co-ordinate the efforts of such bodies.

The EU's efforts in accounting are part of a wider effort to harmonize institutions, irrespective of the size or status of the enterprise. We have suggested that such efforts are unlikely to be successful if the harmonization of accounts is pushed ahead of the harmonization of institutions. Moreover, EU harmonization by means of legal directives is likely to prove to be too inflexible to deal effectively with detailed accounting practices, so that the directives may have relatively little impact on future developments.

Thus the IASC and the EU have a different focus in their pursuit of the common goal of international harmonization of accounting. It is nevertheless most important that both sets of efforts are co-ordinated, so that unnecessary conflict is avoided. We have suggested that it may be necessary to have some formal arrangements for negotiation between the EU and the IASC, although devices such as mutual recognition and the equivalence concept may also provide a framework for negotiations between individual countries. It is also important that the crucial role of national standardsetters be recognized and respected, both within the EU and within the broader constituency of the IASC, so that accounting practice can continue to develop in a flexible manner to meet new challenges within the specific national institutional contexts in which they occur. A degree of harmonization of the work of national bodies may be achieved by informal co-operation of such bodies, as well as more formal compliance with international standards. Recently, a series of meetings of standard-setting bodies has been initiated.[12] These have been attended by representatives of the EU and the IASC, as well as national standard-setting bodies. Such meetings provide an important means by which standard-setters can identify common problems and exchange views.

Within the EU, an important issue is whether there should be some type of EU accounting standards which go beyond the current directives, extending to more detailed guidance of current practice. The current European Accounting Advisory Forum could be the beginning of such a process. It may be more appropriate, however, for the Forum to adopt a co-ordinating role rather than a directive role. This would preserve the contribution of national standard-setters and avoid the potential problems of having too many layers of standard-setting. The existing need to reconcile the IASC, the EU and many national standard-setters suggests a future requirement for bodies which will help in the process of dialogue and reconciliation rather than adding yet more independent voices to the debate.

NOTES

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1 The IASC does not confine the scope of its recommendations to companies whose securities are listed on stock exchanges, but two of its main sources of support are from the auditors of such companies and from the stock exchange regulators as represented by the International Organization of Securities Commissions (IOSCO). This is described in IASC (1989).

2 Action was taken against three countries to enforce implementation of the Fourth Directive.

3 A report of the Fédération des Experts Comptables Européens (FEE, 1991b) has defined these concepts as follows:

> Recognition—the acceptance of consolidated accounts of a particular company (or all those of a particular country) for some prescribed purpose (e.g. to satisfy listing requirements of a stock exchange).
>
> Mutual recognition—the reciprocal recognition, for some prescribed purpose, by authorities (e.g. governments, securities regulators or stock exchanges) of consolidated accounts prepared under each other's rules.

Note that the FEE definition refers specifically to consolidated accounts, which are usually the central requirement in reporting to stock markets. The definition could be broadened to cover other accounts, such as those of individual companies rather than groups, without affecting the central concepts of recognition (which is essentially unilateral) and mutual recognition (which is essentially multilateral).

4 In addition, there are publication rules (Articles 47–50) which are of considerable practical importance but which are not of central concern to the issues discussed in the paper.

5 SSAP 16 was issued by the Accounting Standards Committee (ASC) in March 1980. This required large companies in the UK and Ireland to produce supplementary current cost information if they did not choose the option of using current cost as the basis of their main accounts. The UK government encouraged the adoption of current cost accounting through its creation of the Sandilands Committee (1974).

6 Previous legislation in the UK, notably the 1948 Companies Act, had prescribed the broad content, but not the precise format, of disclosure.

7 Van der Tas (1992a) provides empirical evidence on the case of deferred taxation. He finds that the degree of harmonization of reporting of deferred taxation appears to be greater when the notes to the accounts are taken into consideration: these enable reconciliation of the disparate figures reported on the face of the accounts. Notes relating to deferred tax are required by Article 4.3.1 of the Fourth Directive. Thus, although the Directive does not specify a precise method for calculating deferred tax, it does encourage disclosures which assist reconciliation of the alternative methods (see FEE, 1991a: ch. 10).

8 Stock exchanges in the USA (under Securities and Exchange Commission rules) and the UK recognize accounts prepared under different national regimes only if material differences are reconciled to local standards (in the UK, this includes IASC standards). (FEE, 1991b: Appendix III).

9 This is not to say that all of the countries affiliated to the IASC have followed the IASC's standards.
10 This view is supported by three case studies by Arwidi (1993), who concludes that 'the same rules may give different effects due to differences in economic, institutional or cultural conditions' (p. 65).
11 This case is persuasively argued by Walton (1992).
12 The third was held in London in November 1993.

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Section VI
Surveys and methodology

FINANCIAL ACCOUNTING THEORY: AN OVER-VIEW

by
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Introduction and Plan of the Paper

Financial accounting theory has accumulated a vast literature. A cynic might be inclined to say that the vastness of the literature is in sharp contrast to its impact on practice, but if such comments are to be accepted, they require closer examination. The main object of this paper will be to provide a brief and therefore necessarily highly personal and selective over-view of the subject. A more thorough acquaintance with the subject can be obtained by reading the more specialised and detailed surveys[1] which are available, and, best of all, the original work, some of which is listed in the bibliography at the end of this paper.

The literature of financial accounting theory contains a number of different approaches which co-exist, in some places, as clearly defined and separate layers, and in other places mixed together, rather in the manner of geological strata. This geological analogy can be carried further because, like geological strata, these different approaches were first laid down in different historical periods, and the older strata tend to be the ones which are mined most extensively by current standard-setters and practitioners. The historical approach is a useful method of classifying these layers of theory for expository purposes, and it can also aid our understanding of how ideas have developed. The next section of the paper, therefore, provides an historical categorisation of the development of accounting theory.

In the later sections each category of accounting theory will be described and assessed. Particular attention will be paid to recent developments in accounting theory. These deserve particular attention both because of their topicality and because they are possibly less well covered in text-books and survey articles. Moreover, the study of recent

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[1] The books edited by Abdel-Khalik and Keller (1978) and by Basu and Milburn (1982) each contain excellent surveys of accounting theory as well as empirical research. A series of authoritative statements on the contemporary state of accounting theory have been published at intervals by the American Accounting Association, the most recent being Statement of Accounting Theory and Theory Acceptance (1977).

developments may give practitioners some idea of what seams are currently being laid down to provide a basis for their future mining activities. It should be noted that all varieties of accounting theory are still being actively pursued, so that recent developments are not confined to the newest types of theory: our geological analogy is, in this respect, inappropriate.

In the final section of the paper, we shall attempt to summarise some of the achievements of accounting theory, to identify some of the contributions which it has made to our understanding of accounting practice, and to suggest contributions which it might make in the future.

The Evolution of Accounting Theory—An Historical Over-view

The literature of accounting extends back at least to the fifteenth century, but we are concerned here with understanding the current state and preoccupations of financial accounting theory. For this purpose, it is sufficient to confine ourselves to the twentieth century and to concentrate on the literature published in English. This provides us with a fairly homogeneous literature, showing continuous development to the present day and concerned with a similar institutional environment, albeit an evolving one. This draws attention to an important feature of financial accounting theory, that it does inevitably deal with problems which arise from the institutional environment and cannot be therefore regarded as a purely 'ivory tower' activity. It is also important to note that continental Europe has had a rather different tradition from that of the English-speaking world, due possibly to the relatively small role of stock exchanges in corporate finance in Europe and to the strong influence of codified law on accounting in Europe. Now that the European Community is having an important influence on companies legislation, including disclosure requirements, the study of continental European financial accounting theory and its reconciliation with the accounting theory of the English-speaking world must surely be a task of some importance and urgency.

To return to our main theme, the evolution of accounting theory in the twentieth century primarily in the English-speaking world, there are three main approaches or strata:

(1) The empirical inductive approach. This consists of distillation of theoretical principles from accounting practice, i.e. it is rationalisation of practice.
(2) The deductive approach. This is the logical derivation of theoretical principles by deduction from assumptions, i.e. it is 'pure' theory and can be of a completely 'ivory tower' type if the assumptions are unrealistic.
(3) The new empiricism based on positivism, derived from the Chicago school of economics. This regards theories as worthwhile only if they are testable against empirical evidence, e.g. the impact of a particular accounting practice on investor behaviour as reflected in share prices.

We shall consider each approach in turn although all three co-exist in the current literature (with (3) being the most fashionable) and many pieces of work combine different approaches.

(1) The empirical inductive approach

The empirical inductive approach is evident in the earliest writings on accounting theory. Interest in theory naturally rose out of problems of practice and most early text-books of the subject were surveys of practice. Indeed, many professional text-books are still of this type. The next stage was to provide generalisations of the principles implicit in current practice. These are inductive theories, based upon a rationalisation of current practice. Some very distinguished early treatises on accounting are based primarily upon this approach, such as H.R. Hatfield's 'Accounting—Its Principles and Problems' (1927) or S.Gilman's 'Accounting Concepts of Profit' (1939). This approach is also apparent in the American Accounting Association's 'Accounting Principles Underlying Corporate Financial Statements' (1936), the first of a series of pronouncements by the AAA which have mirrored the evolution of accounting theory. It is also, incidentally, apparent in the work of Schmalenbach (1919 onwards), who was one of the outstanding German writers on accounting.

However, the fact that this approach is well-rooted in history does not mean that it is irrelevant to the present. In fact, it is arguably the most important strand in accounting theory insofar as it affects the world of practice. Theoretical principles derived from the ex post rationalisation of practice have at least three important roles[2]:

1 As a means of evaluating and improving current accounting practices and standards. This ensures that accounting practice evolves in a logically consistent manner (if it is possible to derive appropriate inductive theories from existing practice), and is the most pragmatic means of deriving some form of conceptual framework. Impressionistic evidence suggests that the majority of practitioners naturally incline to this method of developing accounting theory, and that the deliberations of technical committees of professional bodies and the Accounting Standards Committee are dominated by this approach. This is not surprising, since it is the view of theory inculcated by professional training (and only a minority of professional accountants in the UK have been exposed to an academic training in accounting). Moreover, the fact that it was the first on the scene suggests that it is the most natural way for someone versed in practice to approach theory, and its early advent means that it has a large and accessible literature.

2 As a pedagogic device. The educational market in accounting is dominated by the demand for professional training, which in turn is naturally dominated by a need for thorough mastery of currently used techniques. Understanding and learning of such techniques are aided by the availability of theoretical principles which describe and explain those techniques.

3 As a means of justifying present practices to the wider constituency of preparers and users of accounts. Those who employ accountants or use accounts will, from time to time, complain of deficiencies or accounting practices, e.g. that they are misleading or obscure. Theories which 'rationalise' current practices can be used as a defence against such critics.

[2] These issues are also discussed, with somewhat different emphasis, by Watts and Zimmerman (1979)

It should be noted that the empirical inductive approach does not purport to be solely positive (a statement of what is), but can also be used in a normative context (a statement of what ought to be), the implicit normative assumption being that specific accounting practices should conform to general theoretical principles which are believed to underlie accounting practice in general.

The most thoroughly worked-out theoretical propositions of this type are based upon the historical cost method, since this method has dominated and continues to dominate accounting practice. Ideas such as the realisation principle and matching were essentially rationalisations of the practice of historical cost accounting, although they have potential applications to alternative systems. Equally, the concept of materiality and the doctrine of conservatism provide a rationalisation of some practical deviations from the pure historical cost model.

There is plenty of useful work in this vein currently being carried out by academics as well as practitioners. Perhaps the outstanding piece of academic work in this area in recent years has been Thomas' exposure of the allocation problem (Thomas, 1969 and 1974), which pervades current practice, as well as affecting some alternative systems.[3] It is probably fair to say that the nearer a problem is to practical application and the more specific the problem the more the empirical inductive approach predominates. Thus, this approach has dominated the debate on specific topics such as foreign currency translation, deferred tax provisions, and depreciation, all of which have recently been considered by the Accounting Standards Committee.

However, the derivation of principles from practice has its limitations. Most obviously, it cannot cope with problems which are outside the scope of existing practice and require novel approaches. Most obviously in the practical area of accounting standard-setting, this applies to accounting for changing prices, and the fierceness and confusion of the inflation accounting debate is probably due, in part, to this conceptual difficulty. More generally, the underlying issue of the conceptual framework raises issues which are difficult to resolve by reference to the principles underlying current practice, if the objective of the conceptual framework is to provide a frame of reference for fundamental changes rather than steady, consistent evolution of present practice. Of course, the underlying limitations of the empirical inductive approach also apply to the more specific problem areas mentioned above, such as depreciation, once we accept that these problems can be considered in a wider context than that of consistency with present day practice.

The discussion of the limitations of the empirical inductive approach naturally leads us to the discussion of the second approach, deductive theory, as this is not constrained by present practice. The assumptions on which it is based can transcend present practice: practitioners may therefore regard it as 'unrealistic', but it does have the possible advantage of offering insights into new problems or new insights into old problems.

[3] Thomas' work is not, of course, purely of the empirical inductive variety, there being a strong element of deductive theory in his critique. This serves to illustrate that our classification categories overlap in practice. The allocation problem was, of course, identified long before Thomas' work (e.g. it appears in R.S.Edwards' 1938 articles), but Thomas' work was unprecedented in its rigour and comprehensiveness.

(2) The deductive approach

The deductive approach or 'pure' theory, has gone through three broad stages. These are, successively, the 'true income' approach, the user needs approach, and the information economics approach. In each of these stages, economic theory has had a strong influence on accounting thought.

(i) True income

Some early twentieth century writers were unhappy with the traditional historical cost system, which they perceived to be inadequate to meet contemporary needs, particularly in conditions of changing prices. Early American pioneers in this vein include Paton (1918) and Canning (1929). An early British writer in the same style was R.S.Edwards (1938). It should also be noted that certain German writers, notably Fritz Schmidt (1921), and the Dutch school of business economics, founded by Limperg, shared similar preoccupations.

It was natural that such writers should turn to economic theory for inspiration. The problems which they confronted were those of measuring such concepts as income, value and cost, the definition of which falls within the province of economic theory. Moreover, because of the relatively weak development of academic accounting at this time, most of these writers were at least as well trained in economics as in accounting (Canning, Edwards and Schmidt were professional economists, and Limperg founded what is usually referred to as the Dutch school of business economics).

Because the early decades of the twentieth century also saw an increased emphasis on the profit and loss account relative to the balance sheet (as exemplified in Schmalenbach's 'Dynamic Accounting'[4]), these writers tended to emphasise the implications of measurement criteria for the assessment of income, and the economist's concept of income tended to be held up as an ideal. Hence, their approach is sometimes described (e.g. in the 1977 American Accounting Association Statement) as the 'true income' approach, although it did, of course, embrace much more, e.g. a concern for a cost basis appropriate for setting product prices (as in Schmidt's theoretical work on replacement cost).

Perhaps the best early example of the 'true income' approach is Canning (1929). Canning was an economist who made an extensive study of accounting practice, using what we have described as an 'empirical inductive' method to establish the accounting principles used by practitioners. However, he did not regard this practice as ideal but instead compared it with his ideal, derived from deductive economic theory, in order to suggest improvements in practice. His theoretical ideal was the income measure proposed by the economist Irving Fisher (1906), who had an important impact on several areas of accounting.[5] Canning realised that Fisher's ideal income measure (in fact, Fisher

[4] Solomons (1966) is an example, from the later literature, of the application of economic theory to accounting problems of this type.

[5] For example, he pioneered the idea of indexation, from which CPP accounting is derived (Fisher, 1911), and he was an advocate of discounted cash flow as a method of valuation (see Whittington, 1977 for an elaboration of this).

described it as 'earnings', reserving 'income' for the final satisfaction derived by the consumer) was impractical, because of unreliability or unavailability of information. In particular, Fisher's approach was based upon forward-looking information, and was therefore necessarily shrouded in uncertainty. These problems have continued to dominate the income measurement debate up to the present day. Canning's solution was to propose a series of surrogate measures, approximations to the ideal measures which had the advantage of potential practical applicability. Thus the outcome of his studies was to propose a series of current value measures which, he felt, would bring accountants closer to measuring economic income. Incidentally, one of his measures of the value of depreciating assets is based on the idea of 'opportunity differences' and closely resembles the 'value to the firm' concept used in current cost accounting. A similar idea appears in the work of Limperg, although the direct ancestry of 'value to the firm' derives, via the Sandilands Report (1975), from Bonbright (1937).

During the period between the two world wars, accounting theorists of the 'true income' school sketched out most of the alternative methods of income measurement which are being debated today. For example, Sweeney (1936) not only proposed general price level adjusted accounting (CPP) to deal with inflation, but also showed how it could be combined with a replacement cost system, thus producing something very close to the combination of current cost with real financial capital maintenance which is currently required by the FASB's standard on accounting for price changes, FAS33. We have already seen that other writers explored concepts similar to value to the firm, and replacement cost accounting was also discussed during this period (e.g. by Paton, 1918 and Schmidt, 1921). MacNeal (1939), on the other hand, advocated valuation at current market price and was therefore, in part, a precursor of the later 'exit price' school of Chambers (1966) and Sterling (1970), although MacNeal's 'market price' can encompass buying prices as well as selling prices.

In the period following the Second World War, the 'true income' school flourished, notably in the work of the Study Group on Business Income, chaired by George O.May. One of the papers published by this Group, that by Alexander (1950), was subsequently very influential on the course of the 'true income' debate. Alexander provided a careful analysis of the effect of uncertainty on income measurement, drawing attention to the difference between ex post and ex ante income, and the dependency of either measure on the beliefs of the observer. This analysis was carried further by Solomons (1961) who reached the striking conclusion that 'the next twenty-five years may subsequently be seen to have been the twilight of Income measurement'. The same year, 1961, saw the publication of Edwards and Bell's classic 'The Theory and Measurement of Business Income'. This paved the way for future developments by providing accounting formats which could embrace multiple measures of income, e.g. by providing an operating profit measure similar to current cost operating profit and then adding holding gains to provide a broader concept of total income or total gains, similar in principle to the concept of 'comprehensive income', which has been discussed recently by the Financial Accounting Standards Board in the USA.

The nineteen-sixties and early nineteen-seventies saw much theoretical controversy over income measurement, with a particularly fierce controversy between the advocates of current selling price (such as Chambers, 1966, and Sterling, 1970) and the advocates

of replacement cost (such as Mathews, 1968, Gynther, 1966 and Revsine, 1970). Another option proposed was value to the owner, also known as deprival value, which subsequently became the basis of value to the firm in current cost accounting (advocated, for example, by Solomons, 1966, Baxter, 1967, Parker and Harcourt, 1969, and Stamp, 1971). This period has been described as the 'golden age' of accounting theory (Nelson, 1973). However, the description was contained in a paper which was critical of the achievements of a priori research in the period. Theory was seen to provide a series of alternative answers, each following logically from alternative assumptions. This type of complaint is still heard from practitioners who complain that academics disagree among themselves as to 'the answer'.

There were and are two responses to this critique. The first is to narrow the area of disagreement by empirical research, rejecting theories whose assumptions or predictions are at variance with empirical evidence. This type of research has become increasingly popular during the past fifteen years or so, and will be reviewed later in this paper. The second response is to adopt an eclectic approach to income measurement, providing a variety of alternative measures in a format similar to that proposed by Edwards and Bell, on the assumption that different measures will be required by different users, for different uses or in different circumstances. This involves a retreat from the 'true income' approach to a 'different incomes for different purposes' approach, and has been characteristic of the way the income theory literature has developed during the past twenty-five years: in fact, during the period of Solomons' prediction. Income measures then become regarded as useful pieces of information rather than objective measures of some concrete reality. Advocates of this approach include Peasnell (1977), Bromwich (1977) and Beaver and Demski (1979).[6] A good practical example of an eclectic income statement combined with an informal list of user needs which might be met by different measures will be found in Kennedy (1978).

The main lesson to be drawn by practitioners from this literature is that the 'bottom line' should be de-emphasised. The components of the income statement may well have more significance for some users than the net total which appears in the final 'bottom line' profit figure. The degree of concentration on the 'bottom line' in the inflation accounting controversy, and the degree of loyalty which individuals show towards their favoured 'bottom line' measure, suggests that this is one lesson which academics have learned (by hard experience) which has yet to percolate through to the standard-setting process. Of course, for some specific purposes, a single 'bottom-line' may be needed, e.g. for determining corporation tax, management bonuses, or the upper limit to dividends, but the relevant 'bottom line' will depend on the specific purpose, so that it is correct to emphasise that no single measure will meet all needs (e.g. see Kennedy, 1978).

This does not mean that global measures of income have no significance, but rather that such significance is constrained by the circumstances in which the measurement is made and the uses to which it is to be put. Some useful theoretical research has been done in the past ten years. A notable example is Kay's paper (1976) which shows the general

6 Beaver and Demski point out that, for 'true income' to be indeterminate, not only must there be uncertainty, but markets must be incomplete, so that it is not possible to insure fully against uncertainties.

algebraic relationship between accounting measures of the rate of return and the economist's concept of the internal rate of return. This work is currently being extended (in a forthcoming book by Edwards, Mayer and Kay, and in Kay and Mayer (1986)) to cover accounting measures derived from current cost accounting. The users of accounts are likely to continue to wish to use broad summary measures of overall performance, and it is therefore important to understand to what extent and in what circumstances accounting measures will match some theoretical ideal which the user may be seeking, such as the internal rate of return.

(ii) User needs

Discussion of how the focus of income theory has shifted from true income to 'different incomes for different purposes' leads us naturally to a discussion of the user needs approach to accounting theory.

Recognition that accounts must serve some useful purpose has, of course, a long history in accounting theory. However, it is probably true to say that the emphasis has shifted through time towards the needs of users and towards a more precise specification of the needs of different user groups. One of the earliest writers to try to identify the specific users and uses of accounting data was Daines (1929), but most writers of that period and subsequently make at least a nominal recognition of the importance of users. Moreover, the traditional 'empirical inductive' theories are user oriented in the sense that such inductively derived principles as objectivity, consistency and conservatism are presumably intended to prevent the user from being misled. The traditional principle which is most closely related to the user is, of course, relevance, i.e. relevance to users' needs, and it is this property which has received increasing emphasis in the theoretical literature over the years. This has been partly due to the evolution of accounting theory: the first task was to make sense of existing practices and the next was to consider how practices might be improved, and it is at the latter stage that users' needs become crucial. Another contributory factor has been the increased social and political pressure for disclosure. For example, the Wall Street Crash of 1929 led to greater demand in the USA for accounting information which would serve investors, and this was reinforced in the early nineteen-thirties by the Securities and Exchange Acts, which not only increased statutory disclosure but also set up the Securities and Exchange Commission, which has been an important factor in the development of the accounting standard-setting process. Since the Second World War, the interests of a wider group of users, such as employees and consumers, have been recognised as being of increasing importance. In the UK, an indication of the increased user-orientation of accounting and the broadening definition of users, is The Corporate Report (Accounting Standards Steering Committee, 1975), which provides a good summary of contemporary thought on the subject. A United States view is provided by the Trueblood Report (1973), which was oriented more narrowly towards the information needs of providers of finance (investors and creditors) but which nevertheless regards user-orientation as a fundamental principle in designing accounting systems. Incidentally, it should be noted that both of these committees had academic members but had a majority of practitioner members, yet they reflected the trend in accounting theory. This is consistent with two views: that theory does have some impact on practitioners, and that both theory and practice tend to respond to external economic, social and political pressures for change.

Much of the theoretical work of the nineteen-sixties and subsequently claims to be user needs oriented. For example, Ijiri's celebrated defence of historical cost (1971 and 1975) is grounded in the requirements of stewardship, Chambers' trenchant advocacy of exit values (in his Continuously Contemporary Accounting system, 1966 and 1970) is based upon the need for investors and others to know the current cash equivalent of the assets owned by the firm (i.e. their value if the opportunity of disposal rather than retention is chosen), and Revsine's concept of distributable operating flow (1973) is an attempt to define the surplus available for the investor in a continuing business. Some of the alternative techniques which have been proposed as an alternative to accounting income measurement also claim justification in terms of user needs. For example, cash flow reporting (advocated notably by Lawson (1971), and Lee (1972 and 1979) in recent years) has its roots in the calculation of economic value by discounting cash flows, as well as claiming the property of objectivity, which is assumed to be desired by users. However, despite these appeals to user needs, there has been little purely theoretical work in recent years which can claim to be derived from specific user needs (e.g. see Egginton's, 1980, demolition of the concept of 'distributable profit'). Most theoretical work starts with a model of accounting, such as replacement cost, and then seeks to justify it by reference to user needs. It does not start with a particular user need and then seek to find a set of accounting information which will meet that need. A good demonstration of this problem will be found in the book edited by Sterling and Thomas (1979) which brings together essays by advocates of alternative accounting models in an attempt to reach greater consensus. The attempt is unsuccessful because there is no agreement on the identity of the user or their needs, so that however consistent the local deductions, the theoretical conclusions will differ because of differences of assumptions.[7]

One obvious way out of this dilemma is empirical research, and much of the expansion of empirical work from the late nineteen-sixties onwards was directed towards the identification and measurement of user needs. There have been two main thrusts of this type of empirical work, behavioural studies and market reaction studies. The behavioural approach studies the processes by which individuals make use of accounting data. An example is Dyckman's (1969) study of the use of price level adjusted accounting data by investment analysts.[8]

The market reaction studies are concerned with the impact of accounting information on investor behaviour as reflected in stock market prices and trading volume. We shall return later to a discussion of empirical studies.

Another way out of the apparent difficulty of defining user needs is to adopt an information economics perspective, and it is to this which we now turn.

[7] This is elaborated in Whittington (1981), which is an extended review of the Sterling and Thomas book.

[8] Recent British studies of the use of current cost data by institutional investors are those by Boys and Rutherford (1984) and Carsberg and Dayx (1984).

(iii) Information economics

The information economics perspective has been the most important new strand in accounting thought during the past fifteen or twenty years. It is at the heart of what Beaver (1981)[9] has described as 'an accounting revolution'.

Information economics is a relatively new branch of formal economic theory and owes its origins partly to a seminal paper by Stigler (1961), a leading member of the Chicago school of economists. It is therefore not surprising that Its Impact on accounting has been led by accountants who have been trained in Chicago.[10] The essence of the approach is to regard information as an economic good like any other. Thus, there is a market for information in which there is both supply and demand. The idea of a demand for information can be regarded as a formalisation of the 'user needs' approach, but its adds precision to the approach. For example, economic demand is usually conceived as a function of cost, whereas the traditional user needs approach tended to regard the acquisition and processing of information as being free of costs. Equally, study of the supply side of the information market draws attention to the costs of producing accounting information, which again tended to be overlooked or treated rather casually in traditional approaches. The 'cost benefit' approach to assessing accounting standards which has characterised recent assessments of inflation accounting standards both in the UK (the Carsberg Report, 1984) and the USA (Beaver, 1983, and Freeman, 1983) is an informal attempt to apply an information economics approach in practice.

One of the features associated with the information economics approach has been the expansion of empirical research, discussed later in this paper. This is no doubt partly due to the fact that the Chicago school of economics adopts a strongly positivist view (see Friedman's classic essay on Positive Economics, 1953), and therefore believes that theories should be empirically testable. However, it is important to emphasise that empirical research and an information economics approach are not the same thing. Much empirical research (e.g. many behavioural studies) has no necessary relationship to information economics, and some work in information economics (e.g. some recent work on agency theory) has not been expressed in an empirically testable form.

There have been at least two valuable insights into financial reporting which have been derived from the information economics approach. The first derives from the idea of an efficient market. The second relates to the importance of the economic consequences of accounting disclosure. Both have important implications for the standard-setting process.

[9] Beaver's book can be recommended as possibly the best available survey of these recent developments.

10 The 'Rochester School', to which Benston, Watts and Zimmerman belong, can be regarded as an intellectual offshoot of Chicago, Its members having typically studied there.

The theory of efficient markets has, like other aspects of information economics, been developed particularly by economists of the Chicago school (such as Fama, 1970). The central proposition of this theory is that if a market is efficient, it is impossible to make a profit by using available information.[11] If the market is inefficient, then there is scope for making a profit by acting on the information. Studies of the reaction of security prices to the release of accounting information can, as we have already seen, be regarded as a form of market research to establish users' needs empirically, but they can also be used to test whether the securities market is efficient in the sense that it discriminates between form and substance.[12] An effective market should reflect all available information, irrespective of the form in which it is presented, so that, for example, it should not matter whether a particular item is presented in the main accounts or in the notes to the accounts. This has obvious implications for the way in which standard-setting bodies should go about their work (Beaver, 1973). In practice, such bodies tend to spend a great deal of time discussing and prescribing matters of form. This suggests either that they do not believe the market to be efficient, or that they are unaware of the implications of market efficiency.

Information economics also provides insights into the standard-setting process as a whole. Standard-setting is a form of regulation of the information market, and regulation implies that the market operates imperfectly without regulation. A possible reason for this failure of the market includes the fact that information has some of the characteristics of a public good, so that there is a free-rider problem, i.e. because it is difficult to exclude outsiders, who have not paid for the information, from using it, there is little incentive to become an insider and pay, it being cheaper to be a free-riding outsider. Another reason may be the adverse-selection problem: that unregulated information may well show the most unscrupulous (rather than the best) management in the most favourable light. There is considerable disagreement over these issues. Benston (1981) for example, favours a policy of leaving information disclosure to the market place, on the ground that there is a competitive incentive for managements to enter into contracts which bind them to produce information which will satisfy the interests of the suppliers of capital. This argument is derived from agency theory, which is one of the currently fashionable approaches to the analysis of the market for financial information. [13]

However, although the theoretical case for standard-setting bodies is as yet controversial,[14] there is widespread agreement that the standard-setting process itself

[11] This general description covers a variety of definitions of 'available information'. Different definitions lead to the weak, semi-strong and strong types of efficiency respectively (Fama, 1970). Keane (1983) provides a useful and readable review of the efficient markets literature.

[12] See, for example, the studies of Beaver and Dukes (1973) and Kaplan and Roll (1972), and subsequent studies, which assess the affect of different depreciation reporting methods (which have no different implications for future cash flows, and are therefore purely changes of form) on security prices, in the USA.

[13] A useful survey of agency theory is Atkinson and Feltham (1982).

[14] Beaver (1981), Chapter 7, provides a useful summary of the main arguments.

involves issues of social choice. Information has value to users (in resolving uncertainty surrounding decision-making) and imposes costs on suppliers. Thus, decisions about reporting standards benefit some members of the community at the cost of others. Insofar as financial information affects decisions beyond the confines of the securities market, such as the outcome of wage negotiations, taxation policy and competition policy, this reinforces the social choice aspects. Thus accounting decisions and accounting standards have economic consequences and the standard-setting process is a political process, involving the reconciliation of the conflicting interests of different groups.

The recognition of economic consequences and the political nature of standard-setting was originally due as much to the fruits of institutional and historical studies by writers such as Horngren (1972 and 1973), Zeff (1971 and 1978), as to the application of information economics. However, the application of the tools of information economics has helped to add precision and further insights, as, for example, in some of the work of Watts and Zimmerman (1978).

The New Empiricism

It is not the purpose of this paper to survey the empirical literature which has flourished since the late nineteen-sixties. Useful surveys of this will be found in Kaplan (1978), Peasnell (1981), Bever (1981, Chapter 5), Ball and Foster (1982) and Lev and Ohlson (1982). However, it is necessary to discuss empirical research briefly because it has had an important impact on the development of accounting theory.

We have already seen that the increased attention given to empirical work can be seen as a consequence of development of accounting theory, in at least three ways. Firstly, there was the disillusionment with the grand a priori theorising of the nineteen-sixties, which many, such as Nelson (1973), regarded as leading to an essentially sterile debate between rival all embracing theories. It was felt that the way to resolve such a debate was by resort to empirical evidence, to establish which theories had the most realistic assumptions or the greatest capacity to predict observed events. Secondly, the evolution of accounting theory was taking it into areas where empirical research was a natural complement to abstract theorising. Notably, the increased emphasis on user needs and the development of the information economics perspective, as opposed to the true income approach, led to interest in establishing what information users would need in practice. Thirdly, the influence of the Chicago school of economists on the development of accounting theory, notably the information economics approach, was associated with the influence of the Chicago school's strongly positivist philosophy. The obvious vehicle for this approach has been the Journal of Accounting Research, edited and published in Chicago, which has published a large proportion of the important empirical work, including the Ball and Brown study (1968) which pioneered the share price residual approach to measuring market reaction, and was therefore probably the most influential,

and the most quoted, empirical paper of the past twenty years.[15] It has also become probably the most prestigious academic journal in the field and publication in it is a way to academic promotion. Since empirical work of the 'handle turning' variety is relatively easy in the age of the computer (especially once the basic model has been formulated by others, such as Ball and Brown), it is not surprising that the empirical approach has become almost a cult among ambitious young academics, especially in the USA.

The growth of empirical studies has contributed a great deal to our knowledge and has more to offer in the future. However, some of the more extreme adherents of the positivist school, notably Watts and Zimmerman (1979), have carried their enthusiasm for the positivist approach to such an extent that they seem to denigrate all theories which are not simply descriptions of what happens in the real world.

> 'The predominant function of accounting theories is now to supply excuses which satisfy the demand created by the political process; consequently accounting theories have become increasingly normative' (Watts and Zimmerman, 1979, p 301).

The Watts and Zimmerman paper has been extensively (some might think extremely) criticised by Christenson (1983). For present purposes, it must be sufficient to make the following three observations:

1 Any supposed conflict between 'theory' and the 'empirical' approach is misguided, because the two are complementary. Any empirical observation, for example, implies selectivity and categorisation which imply a theoretical standpoint. Equally, Watts and Zimmerman (e.g. in their 1978 paper), when they do empirical studies, draw up a deductive theoretical model, which they then test against the data.
2 It is equally misguided to imply that a theory which is untestable empirically is not useful. For example, Thomas' (1969 and 1974) elegant logical critique of the allocation problem in accounting tells us a great deal about the rationality of traditional methods, despite being based purely on deductive logic.
3 It is important to recognise that empirical research can have normative implications and that deductive theory is not necessarily normative. We have already seen that the most basic form of theorising, the empirical inductive approach, which rationalises existing practices by deriving such concepts as the matching principle, can be normative if we take the view that 'whatever is, is right', but it can equally be merely a taxonomic description of practice. The pure deductive theoretical approach tells us the logical implications of a set of assumptions, but we would accept it as normative only if we agree with its assumptions (and also that rationality is desirable). The empirical approach also is often used to derive normative implications, e.g. writers of Watts and Zimmerman's own Rochester school are inclined to conclude that regulation of accounting is undesirable, but equally it can be used merely to describe behaviour.

[15] See Dyckman and Zeff (1984) for a scholarly and thorough history of the Journal of Accounting Research and its achievements.

It is important to establish the complementary relationship between 'theory' and 'empirical work', because empirical studies have recently made a welcome entry on to the standard-setting scene. The FASB was a pioneer in this (e.g. in Dyckman's 1977 study of the impact of oil and gas reserve disclosures) and recently the approach has appeared in the UK, notably with the publication of the Carsberg Report (1984) on the usefulness of current cost accounting. This study was surrounded by a degree of controversy which demonstrates that empirical studies cannot be expected to resolve all problems which pure theory cannot solve. Indeed, a better integration of theory and empirical studies may make both more effective (these views are expressed at greater length, in the context of the Carsberg Report, in Whittington, 1985).

Retrospect and Conclusions

We have surveyed accounting theory, using a historical categorisation, the oldest approach being rationalisation of practice ('empirical inductive'), the subsequent approach being pure theorising from assumptions ('deductive theory') which has gone through three stages, the search for 'true income', the 'user needs' orientation, and finally the information economics perspective. The latter two developments have been associated with the expansion of empirical work in recent years.

Although the categorisation was historical, describing the various types of theory in the approximate order in which they first started to appear, it is important to emphasise that all of these types of theory have continued to be pursued to the present day. Indeed, many pieces of work involve more than one type of approach to theory, and the dividing lines between the categories are, in any case, arbitrary, e.g. the user needs approach is obviously difficult to differentiate from information economics, the difference being a matter of emphasis. Furthermore, it should not be assumed that, because one type of theory is older than another, it is necessarily worse: it could equally well be argued that older types of theory have been better developed and are in that sense sounder. Certainly, the older types of theory have wider circulation and may have more current impact on the world of practice. However, the newer types of theory are tomorrow's older types of theory, and we might reasonably look to them to see what ideas will affect practice in the future.

This paper has attempted to provide an over-view of the subject, rather than a detailed survey. Even so, there has been enough detail to show that summarisation can be superficial and misleading. However, it would be unsatisfactory to end without some indication of the achievements of accounting theory, especially as one of the central objects of the paper is to interest the intelligent practitioner. We therefore conclude with a brief summary of some of the main achievements and concerns of accounting theory in the present state of the art.

The empirical inductive approach, rationalising observed practice, still plays an important role in the evaluation of current practice and the development of current standards. It has contributed a great deal to the understanding and analysis of generally accepted accounting practice. It will continue to be important insofar as it is wished to develop accounting practice in a logically consistent and evolutionary manner. This is probably the view of accounting shared by most thinking practising accountants,

including standard-setters and technical partners. It also has a long and honourable tradition in the academic literature and is still an important component of academic writing on current practice. It would continue to dominate the development of accounting practice if this were left to the market place, as writers such as Benston (using a modern information economics perspective) would advocate. It would also predominate if Stamp's proposal (Stamp, 1980, Chapter 10) for an evolutionary approach to standard-setting were adopted. Finally, a good proportion of current accounting education, especially for professional examinations, is dominated by concepts such as accrual accounting, matching, realisation, materiality, objectivity and conservatism, which have been derived as a rationalisation of present practice, so that this mode of thought is already well-rooted in the minds of future generations of professional policy-makers.

The logical deductive approach, or pure theory, has gone through a number of stages. We have looked at it as a three-stage process, although other classifications would be equally acceptable.

The true income phase led to an understanding of the deficiencies of traditional historical cost accounting. However, it was easier to show that historical cost failed to provide accurate measures of the economist's concepts of income, cost and value than to devise a system which provided better measures of these concepts. There were, however, significant positive achievements of this phase of theory, which was largely a response to the problem of changing prices. For example, the technique of stabilising accounting for changes in the purchasing power of money (CPP accounting) was devised by Sweeney (1936) and others. It is notable that CPP (or approximations to it) have been applied in practice when inflation has become very rapid, not only in the past (in the 1920s) in Germany, but in the present in three leading South American countries (Brazil, Chile and Argentina). The weakness of CPP adjustment is that, if it is applied to historical cost, it fails to capture changes in specific prices of assets, and the 'true income' debate, with its search for a good approximation to a value consistent with economic theory, has produced the deprival value or value to the firm principle, which has provided the valuation basis underlying the application of current cost accounting both in the USA (FAS33, 1979) and in the UK (SSAP16, 1980). The use of an ideal measurement standard drawn from economic theory, such as the internal rate of return, still has an important contribution to make to the evaluation of accounting systems, as in the work of Kay (1976 and subsequently). Thus, the 'true income' phase of accounting theory is in no sense defunct.

The user needs approach, which followed the recognition that 'true' income or value might depend upon the use to which the measurement was put, has also made a useful contribution to our understanding of accounting in practice as well as theory. Both the Trueblood Report (1973) in the USA and The Corporate Report (1975) in the UK have adopted this approach and have had an influence on the subsequent evolution of standards. For example, the FASB's subsequent development of its conceptual framework follows closely the Trueblood Report's orientation towards investor decision-making and estimating future cash flows to investors, whilst the recent Carsberg Report (1984) (published by the Institute of Chartered Accountants in England and Wales) and Neville Report (1983) (published by the Accounting Standards Committee) indicate a concern with identifying different constituencies of users and preparers, which is

consistent with The Corporate Report.[16] However, although the general tenor of the user needs approach has been accepted, this approach has been disappointing insofar as there is relatively little literature which attempts to define the precise needs of specific users and deduce the form of accounting reports which will meet those needs. It might be possible to interpret Ijiri's (1975) exploration of stewardship accounting as an exercise of this type (although it has strong elements of the empirical inductive approach). There has also been a somewhat unsatisfactory exploration of the concept of distributable profit in recent years (analysed critically in Egginton, 1980), and some attempts have been made to show how different forms of accounting for price changes can be used in share valuation (e.g. Kennedy, 1976). In the wider social context, the use more rigorously explored (mainly by economists rather than accountants) is corporate taxation, e.g. in the Meade Committee Report (1978). Some effort has been expended in exploring user needs empirically, but this can only establish users' own current perception of their needs and is not, without the aid of normative theory, a complete vehicle for deriving normative propositions about improving practice. Thus, deductive theory exploring user needs is an area still requiring much development.

The information economics perspective is the most recent development of accounting theory, and is a natural outgrowth of earlier theoretical approaches. This is certainly true of one important insight which it gives, i.e. accountants should not merely focus on the bottom line of the income statement but should regard all the components of profit as potentially useful items of information. This proposition is consistent both with the 'true income' approach, which tells us that, given a world of uncertainty and market imperfection, we can only, at best, hope to approximate ideal measures, and with the 'user needs' approach which tells us that we might need different measures for different purposes, e.g. the appropriate measure of profit for dividend distribution purposes may well be different from the appropriate measure for corporation tax purposes.

However, the information economics perspective has much more to offer. If we believe that securities markets are efficient, it suggests that accounting standards governing disclosure to investors should concentrate on the substance rather than the form of disclosure. Also, it gives us insights into the circumstances in which accounting standard setting by an autonomous body is appropriate, rather than leaving accounting practices to be established in a free market. The reasons for having a standard-setting body should give some clues as to the desirable constitution of such a body. It is also apparent that standard-setting is a political process, involving a choice between the conflicting interests of different parties. At the level of detailed disclosure requirements and practices, agency theory can offer insights from an information economics perspective: again, this can be regarded as an offshoot of more traditional approaches, agency being a more tightly defined analysis of the stewardship concept.

In summary, information economics is currently one of the more interesting and potentially fruitful areas of research. It is always difficult to assess what is most valuable in current research, but it would be surprising if information economics did not have an important influence on future accounting thought and practice.

[16] Although it must be admitted that The Corporate Report's wider social accounting perspective seems to have been largely ignored by the standard setters, preparers and investors being the central concern. This is an inevitable consequence of the fact that these (and particularly preparers) are the active groups which need to be placated.

Finally, the recent growth of empirical research was discussed as a natural outgrowth of recent developments in accounting theory. Empirical research is another potentially fruitful source of knowledge which is difficult to assess at present but will probably be of increasing importance in the future. This will have wholly beneficial effects provided that empirical research and theory are seen as complementary activities rather than competing with one another. In the advancement of knowledge in an applied discipline like accounting, there must surely be scope for rigorous logical deduction in the formulation of theories and the regular confrontation of the assumptions and predictions of theories with empirical data, in order to establish their relevance to the real world.

The final message to emerge from this overview of accounting theory is that there have been considerable achievements in the subject during the twentieth century. These include a significant impact on practice, as well as results of the academic 'knowledge for its own sake' variety. There is promise that present and recent research will make an equally important contribution in the future. The implication of this is not merely that more research should be supported, but that practitioners as well as academics take a serious interest in it. It is a sad commentary on past and present professional education that a majority of qualified accountants are probably unaware of most of the developments discussed in this paper and, moreover, are quite proud of their ignorance.[17] Too often, they dismiss research because it does not yield simplistic 'cure-all' solutions. The evolution of research must be matched by the evolution of education, if we are to reap its full benefits.

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[17] For example, the dynamic young senior partner of a leading international accounting firm dismissed half a century of research effort in inflation accounting with the remark, 'I am not sure that the accademic side to the profession has actually made anything in the way of a significant contribution to a result in this dilemma' (Brandon Gough, Accountancy Age, 5 January 1984, p. 10)

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Positive Accounting: A Review Article

G.Whittington

Introduction

Watts and Zimmerman are, deservedly, two of the most widely discussed contributors to the accounting literature of the past decade. Not only have they made substantial individual contributions to the accounting literature (for example, a number of pioneering empirical studies by Watts, and Zimmerman's striking analysis (1979) of the reasons why cost allocations are made) but, working as a team, they have attempted to identify and develop a 'positive accounting theory', notably in two papers in *The Accounting Review* (1978 and 1979) in the latter of which they described accounting theories as supplying 'the market for excuses'. Not content with this achievement, they are joint founder-editors of *The Journal of Accounting and Economics*, which has achieved international recognition for its dissemination of the type of empirical studies which they advocate.

It is also the case that Watts and Zimmerman's ideas are controversial. To some extent, this is the inevitable consequence of innovation: those whose intellectual capital is invested in the old ways do not always take readily to new ideas. It is also inevitable that novel approaches require time to develop and will initially have the natural defects of the prototype: this is readily conceded and the early stages of development and improvement are described frankly and clearly in Watts and Zimmerman's (1986) book. However, there is an additional ingredient in the controversy surrounding Watts and Zimmerman's work. This is the single-minded way in which they present their own view of the subject, dismissing the *a priori* theories of the 1960s as 'excuses'. There may be a natural tendency for the enthusiastic innovator to be over-zealous in the advocacy of the new and dismissive of the old, but the result is a view of accounting theory which many would see as unbalanced, and a presentation of the arguments and evidence which some would see as tendentious. In this respect, Watts and Zimmerman are firmly in the tradition of the accounting theorists of the 1960s whom they attempt to dismiss as mere providers of 'excuses'. They too tended to cling obsessively to their own views of the world, dismissing those who made alternative assumptions, and ignoring the logical validity of the theories derived from those assumptions, thus precluding discussion of a whole range of theoretically possible situations.

In order to examine the Watts and Zimmerman contribution more fully, and to investigate its limitations, we shall first consider the contents of their recent book and attempt a summary of the thrust of their argument. We shall then examine the limitations of the 'positive' methodology, the further limitations imposed by their assumptions about the market and, finally, the limitations of their own positive theory of accounting choice.

An outline of 'positive accounting theory'

Watts and Zimmerman start their book with a fundamental statement of The Role of Theory (Chapter 1). Their view is that:

> The objective of accounting theory is to *explain* and *predict* accounting practice, (p. 2)

This naturally precludes the theories of the 1960s which tended to be normative in content:

> …theory, as we describe it, yields no prescriptions for accounting practice. It is concerned with explaining accounting practice. (p.7)

The essence of positive theory is seen to be that it explains and predicts behaviour, in contrast to normative theory which is prescriptive. Thus theories which say how accounting ought to be done are excluded from Watts and Zimmerman's view of

> the economics-based accounting theory that evolved from the use of the scientific concepts of theory.

Subsequent chapters trace the historical evolution of this approach to accounting theory. Chapter 2 describes the Efficient Markets Hypothesis (EMH) and Capital Asset Pricing Model (CAPM) which underly most empirical research of the post Ball and Brown era, and Chapter 3 surveys the empirical literature on the reaction of stock prices to accounting earnings which was initiated by Ball and Brown's classic paper (1968), which introduced the abnormal performance index (API), and the equally important paper by Beaver (1968). Chapter 4 discusses the literature on stock market reaction to changes of accounting method, which was initiated by the Kaplan and Roll (1972) study, and which was a natural extension of the API studies of accounting earnings. Chapter 5 considers the empirical studies of accounting numbers as predictors of business failure (e.g. Altman, 1968) and of risk, as measured by β in the CAPM model (e.g. Beaver, Kettler and Scholes, 1970). Chapter 6 then turns to the time series properties of accounting earnings, completing the survey of the set of empirical studies (or, as Watts and Zimmerman (p. 156) describe it, 'one line of positive accounting theory') whose primary interest is the relevance of accounting data to the market value of shares.

The authors then embark on the 'prelude to a new theory' (Chapter 7) which is developed in Chapters 8 to 13: 'This research emphasizes the explanation of accounting practice variations across firms and industries, not accounting's role in providing valuation information' (p. 156). The 'prelude' consists of a somewhat tendentious discussion of disclosure regulation rationales, the main theme of which is to discredit the 'public interest' view of regulation that it is intended to increase social welfare, in favour of the view that 'politicians and regulators are no different from anyone else: that is, they act in their own self-interest' (p. 176). It is suggested that managers' choice of an

accounting method may be determined by its consequences for the political process (e.g. utility rate regulation), and also by its implications for various contracts which use accounting data (such as debt covenants). The latter theme is developed in the following two chapters, which discuss the agency theory rationale of the firm and the contracts with which management binds itself, particularly debt contracts and management compensation contracts. This is followed (Chapter 11) by further discussion (again somewhat tendentious) of the political process, in which the 'size hypothesis' is discussed (i.e. the view that larger firms incur potentially greater political costs), and the general view is advanced that political costs create an incentive to choose accounting methods which diminish reported earnings. The account of the new positive theory of accounting choice ends with a survey of empirical tests of the explanation of choice of accounting method by contract-related variables (Chapter 11) and the effect on stock prices of choice of accounting method, particularly the hypothesis that mandatory restrictions on accounting choice reduce stock prices (Chapter 12). The empirical evidence is, for the most part, weak and inconclusive, but the authors point out that both theory and tests are at present crude. The discussion of the new positive theory concludes (Chapter 13) with an account of the application of contracting theory to auditing, and some empirical evidence relating to this.

Finally, Watts and Zimmerman present their own, rather immodest, view of the importance of the type of positive theory which they favour. Chapter 14, on The Role of Accounting Research', is taken from their controversial 'market for excuses' paper (Watts and Zimmerman, 1979). They start with the arrogant assertion:

> Throughout this book, we use science's concept of theory (positive theory). Under that concept, the object of accounting theory is to explain and predict accounting practice (broadly defined) (p. 338).

Presumably, we are being invited to believe that any theory which does not 'explain and predict accounting practice', in the sense implied by Watts and Zimmerman's brand of 'positive theory', is unscientific, and therefore in some sense a bad thing. This impression is reinforced by the subsequent assault on 'prescriptive theory' which seems to embrace most of what was written about accounting before about 1966, and most of what has since been written outside North America. This type of 'prescriptive theory' serves the 'market for excuses':

> The excuses demand is primarily from the political process and arises because of information costs (p. 350).

Since the general thrust of earlier chapters has been to assert (largely on the basis of assumption rather than 'positive' empirical evidence) that the political process is inefficient, expensive and, in general, an obstruction to the efficient working of the market place, it seems that we are being invited to believe that the demand for excuses is not something which should be satisfied. Indeed, the market for excuses is the only market in which Watts and Zimmerman seem possibly to be prepared to contemplate regulation. However, when it comes to summarising and evaluating their own positive accounting theory (Chapter 15), rather than competing approaches, they offer a much

more balanced view. They readily concede that empirical studies of accounting choice have, hitherto, lacked a coherent theoretical base, that the evidence used has been inadequate in important respects (e.g. the lack of attention given to the details of the contracts which are believed to determine accounting choice), and that there are problems of statistical analysis (such as collinearity among the contracting variables).

The methodology of positive accounting

Watts and Zimerman's strident advocacy of the methodology of positive accounting is the most controversial aspect of their work in general and of the present book in particular. It has already been the subject of a most cogent and incisive critical analysis by Christenson (1983), and it is unnecessary to repeat his philosophical critique. It is notable that Watts and Zimmerman's book makes no reference to Christenson's paper (although it is listed in the Bibliography) and makes no attempt to answer his criticisms of their methodology. A possible reason for this is that they were unable to make a plausible answer, although an entertaining alternative hypothesis is that, true to their positive methodology, they do not consider that an answer is necessary, since Christenson does not advance empirically testable propositions by which his (essentially, *a priori* logical) arguments can be refuted.

It might perhaps be argued that Watts and Zimmerman's extreme methodological stance and trenchant criticism of alternative approaches does serve a useful purpose in drawing attention to their views and in stimulating debate. They do, after all, view accounting research 'as an economic good' (p. 340) and marketing ability is a desirable skill in purveyors of an economic good. However, marketing literature is not always the most reliable source of information for those in search of a balanced view, and, as has already been observed, lack of respect for alternative views was, ironically, one of the faults of the 'normative' theorists of the 1960s who are criticised by Watts and Zimmerman.

Although it would not be appropriate (or, for this author, possible) to restate or emulate Christenson's critique of positive accounting methodology, two practical aspects of the Watts and Zimmerman approach deserve brief attention. They are, firstly, their claim to prefer the positive to the normative and, secondly, their emphasis on empirical evidence rather than *a priori* theory.

The essence of the positive accounting methodology seems to be that its objective 'is to *explain* and *predict* accounting practice' (p. 2). This is distinguished from 'normative (i.e. prescriptive) positions' which seek 'to prescribe the contents of acounting reports' (p. 7). The distinction depends upon the view that 'prescription requires the specification of an *objective* and an *objective function*' (p. 7). This leads to the claim that positive theory is 'the economics-based accounting theory that evolved from the use of the scientific concept of theory' (p. 13).

It might be inferred from this that positive theory is somehow value-free and 'scientific', whereas normative theory was highly value-laden (determined by the choice of objective function) and therefore 'unscientific'. Two objections can be made to such an inference.

Firstly, positive theory is not free from value judgements or prescriptive implications. At the most basic level, the question asked (or hypothesis tested) implies a prior view of what is an interesting question, and at the level of empirical testing, value judgements can influence the choice of maintained hypothesis. Watts and Zimmerman's own view of the world, as described in this book, is characterised by strong prior beliefs (or maintained hypotheses), relating, for example, to the effectiveness of the market system (e.g. 'the single-period capital asset pricing model (CAPM) is used throughout the book as the valuation model', p. x.), and indeed they seem happy to call on 'normative' theoretical welfare economics when it suits them, e.g. in the use of Arrow's impossibility theorem (p. 162). Thus, even if they do not explicitly introduce an objective function, their work is heavily constrained by prior beliefs, which determine their assumptions and the hypotheses which they test. Furthermore, they admit that positive accounting research can, given the diversity of results, serve the market for excuses (p. 346).

Secondly, it would be incorrect to assume that all theory which is not positive, in the sense of leading to empirically testable propositions, is normative in the sense of leading to prescriptions. Mathematics, for example, is not usually thought of as being prescriptive, despite the fact that its essential method is deduction from assumptions, rather than empirical testing, and empirical researchers themselves make considerable use, in assessing their results, of statistical techniques founded on probability theory, which itself is a body of theory based on deduction rather than empirical testing. There seems to be no obvious reason why accounting theory should not contain a body of knowledge based on deduction from axioms. Indeed, if this is not the case, accounting theory will be constrained to analysing what *is* (i.e. what can be empirically observed) rather than what might be. Furthermore, it seems that such a body of accounting theory exists in the work of such authors as Ijjiri (1967, listed in Watts and Zimmerman's bibliography but not discussed in the text), Chambers (1966) and Edwards and Bell (1961). The latter works are categorised as prescriptive (p. 7), but they contain logical truths which should not be dismissed because the authors also try to apply them to policy issues, any more than Watts and Zimmerman's entire book should be dismissed because it contains speculations about the relative costs of accounting regulation and the free market (Chapter 7).

This raises the issue of the second distinctive feature of positive theory: its emphasis on predictions rather than assumptions as a means of testing the validity of theories. Students of the controversies of the 1960s in accounting theory, which were most effectively criticised in Nelson's influential paper (1973), will readily concede that the infusion of empirical testing, as described in Watts and Zimmerman's book and Beaver's book (1981) in the same series, has been a most welcome innovation. Nelson's 'golden age' of accounting theory was dominated by *a priori* reasoning from assumptions, and there was much unnecessary controversy between opponents whose differences arose from their assumptions rather than errors of logic. One obvious means of resolving such disputes, if they concern the relevance of the competing theories to the real world, is to test the empirical validity of their predictions. However, discriminating between alternative hypotheses by means of empirical tests is not always easy (as Watts and Zimmerman's own account of the literature demonstrates), and not all hypotheses have testable empirical predictions. Thus, total reliance on empirical testing will not solve all the problems of accounting theory.

Watts and Zimmerman's book is, in fact, a good illustration of the need for good *a priori* theory and its complementarity to empirical testing. Their earlier chapters, surveying the literature on the stock market impact of accounting information, are marked by a very loose and informal theoretical framework, based on the idea that shareholders are trying to estimate the future cash flows of the firm (i.e. from the shareholders' point of view, dividends). The latter is, of course, a theoretical assumption, but no precise deductive theory, on the lines of the income measurement theories of the 1960s, is used, because:

> …the EMH implies that if there is an empirical association between earnings and stock prices, earnings can be useful even if they are not calculated consistently in terms of a formal definition of income (p. 20).

This comes very close towards what Samuelson (1963) (in a critique of Friedman (1953)) described as the 'F-twist', the view that 'A theory is vindicable if (some of) its consequences are empirically valid to a useful degree of approximation; the (empirical) unrealism of the theory 'itself, or of its 'assumptions', is quite irrelevant to its validity and worth'. We would surely have more confidence in the underlying hypothesis (that 'earnings can be useful') if we had a more precise theory (based on 'realistic' assumptions) of why earnings measures should be 'useful' to shareholders, rather than simply observing an empirical correlation. Instead, we are left with an extremely weak argument that earnings are useful because:

> If depreciation is approximately equal to the investment each year then accounting earnings would approximate cash flows and the market value of the firm…would be approximately equal to the present value of the firm's expected future earnings (p. 28).

What this seems to mean is that in some (unlikely) circumstances, earnings can equal dividends. This raises two questions:

(i) Why is it not sufficient to report merely dividends rather than earnings?
(ii) Are current earnings good predictions of future dividends (a question requiring both an underlying theory and empirical testing)?

The latter question is crucial but is left as an informal, untested belief:

> Underlying the tests of association…is the notion that earnings are measures of current and future cash flows (p. 65).

To be fair to Watts and Zimmerman, once they leave the area of income measurement, where they are reacting against the excessive *a priori* theorising of the 1960s, they do recognise the need for better theory, although they tend to maintain the Friedmanite positive view that accuracy of empirical prediction is more important than realism of assumptions. For example, they bemoan 'the lack of an economic theory of volume' (p. 64), and they do acknowledge the lack of a theory of how cash flows and earnings are generated and are related to one another (p. 136). Equally, when they discuss their own

positive theory of choice of accounting method, they are prepared to acknowledge the need for greater theoretical refinement, e.g.

> The lack of a well-developed positive accounting theory results from the lack of rich economic theories of the firm (including the contracting process) and of the political process (p. 357).

Thus, in practice, Watts and Zimmerman's work is entirely consistent with a sensible combination of *a priori* reasoning and empirical testing. They may lay relatively more emphasis on empirical tests than realistic assumptions, whereas the theorists of the 1960s tended to neglect empirical testing, but the reader who is more interested in accounting than philosophy might well be led to the conclusion that much of the rhetoric about positive accounting methodology is unnecessary, except as a device for discrediting potential competitors. After all, 'theories evolve through competition among researchers' (p. 362).

Equally, we have already seen that it is somewhat unfair to label *a priori* theories as necessarily prescriptive or value laden, or to imply that the positive approach is exempt from these characteristics. We now turn to an important area which illustrates the latter proposition, the market assumptions made in Watts and Zimmerman's book.

The market assumption

The Rochester School of accounting, to which Watts and Zimmerman belong, is an intellectual offshoot of the Chicago School of Economics. The latter has been perceptively analysed by Reder (1982), who described its central assumption as follows:

> In essence the Chicago View, or what I term 'Tight Prior Equilibrium' theory (TP), is rooted in the hypothesis that decision makers so allocate the resources under their control that there is no alternative allocation such that any one decision maker could have his expected utility increased without a reduction occurring in the expected utility of at least one other decision maker. (Reder, 1982, p. 11)

Reder points out that this is essentially a definition of Pareto optimality, and that further assumptions are typically made by Chicago economists to derive testable hypotheses:

> The further assumptions may be summarized as follows: (1) *most* individual transactors treat the prices of all goods and services they buy or sell, as independent of the quantities that they transact; (2) the prices at which individuals *currently agree* to transact are market clearing prices that are consistent with optimization by all decision makers; (3) information bearing on prices and qualities of all things bought and sold, present and future, is acquired in the quantity that makes its marginal cost equal to its price, i.e. information is treated like any other commodity; (4) neither monopoly nor governmental action (through taxation or otherwise)

> affects relative prices or quantities sufficiently to prevent either marginal products or compensation of identical resources from being approximately equal in all uses.

These assumptions are essentially those of perfectly competitive equilibrium, and may be found unacceptable by many as a description of how the world actually operates. However, objections to the realism of assumptions are precluded by 'the F-twist' which, in the extreme, asserts that:

> Truly important and significant hypotheses will be found to have 'assumptions' that are wildly inaccurate descriptive representations of reality…(Friedman, 1953, p. 14).

Watts and Zimmerman's assumed economic setting is consistent with this outline of the 'Chicago view' and the philosophy of 'positive accounting' clearly owes much to Friedman's 'positive economies'. For example, throughout their book the CAPM and the EMH are assumed to be the basis of share valuation. On the EMH they say:

> Today, the acceptance of the EMH is such that empirical regularities apparently inconsistent with the hypothesis are called *anomalies* (p. 158).

We can again compare this with Reder's account of 'the Chicago View':

> Any apparent inconsistency of empirical findings with implications of the theory, or report of behaviour not implied by the theory, is interpreted as anomalous…(Reder, 1982, p. 13).

Of course, Watts and Zimmerman are not unique in owing intellectual allegiance to the Chicago View or in regarding the EMH as a maintained hypothesis. The majority of North American empirical accounting researchers would fall into this category, and their collective achievements are formidable. However, it is important to point out that this represents a constrained view of accounting research, and that prior beliefs (or maintained hypotheses) play an important part in it, despite the claims to 'scientific' and value-free status. It is particularly important to do this in the case of the present pair of authors, because they are inclined to be so dismissive of alternative approaches (particularly the *a priori* theorists of the 1960s) and to imply that they have a monopoly of the truth.

In order to illustrate the possible limitations of this type of research, derived from the Chicago View, we shall briefly consider two issues, the EMH assumption and the role of regulation, as discussed by Watts and Zimmerman.

(i) *The EMH Assumption*

The EMH assumption is fundamental to most of the empirical studies described in the book, or, at least, to the inferences drawn from them. We are told that:

> On average, in an efficient market, stock prices adjusted for the market's expected rate of return are correct estimates of future stock values. (Watts and Zimmerman, 1986, p. 21)

This is correct only if we equate prices with values. The EMH asserts that the market is fair game efficient, i.e. that present market prices reflect, on average, correct estimates of future returns (typically tested over a short time horizon), where returns are measured as changes in market price (i.e. capital appreciation of share price) plus dividends. Changes in price usually dominate dividends in the return measure, so that the EMH is really asserting a relationship between present prices and future prices (not values). If, in some fundamental sense, the market undervalues or overvalues certain shares at all of the times when market price is observed, the EMH may be seen to hold (the market may be fair game efficient over the period observed), but the market will be inefficient in the fundamental sense described by Keynes (1936, pp. 150–64), i.e. share prices will not necessarily reflect the best current estimates of the long-run returns (potential dividends) of individual firms.

Keynes' celebrated 'beauty contest' stylisation of the market was one in which market transactors were trying to guess one another's future actions rather than the fundamental characteristics (i.e. future dividend-paying potential) of the shares. King (1977) suggests that this can be modelled theoretically as a temporary equilibrium. Of course, it has been argued by some proponents of the EMH, such as Beaver (1981), that the 'intrinsic value' of a share is a meaningless concept, and 'fundamental value' is certainly a better term to use, implying valuation based on the fundamental characteristics of the firm rather than on short-term prospective changes in share prices. However, fundamental analysis has a long and continuing history, which requires some explanation if the information market is competitive and the market does not take account of fundamental characteristics, and it is interesting to note that Beaver himself in his studies of the effects of FAS 33 (Beaver and Landsman, 1983, Chapter 4) appears to assume that, in a competitive equilibrium, Tobin's 'q' for current cost accounts should be unity, i.e. the current cost book value of equity should equal the stock market value. This seems to amount to using current cost value as a form of fundamental value in the specific market setting which is being assumed.

The relevance of this to accounting should be clear. If, as Beaver (1981) correctly points out, market efficiency is defined with respect to a specific information set, then, if we are concerned with fundamental characteristics, it is possible to improve the market's valuation process by widening the information set. By making possible better forecasts of the long-run returns of individual firms, such information might improve the decisions of investors who were interested in long-run income rather than short-term capital gains, and lead to a better allocation of resources (in the sense of a Pareto improvement, by channelling funds to areas with the best returns on investment) both between individual firms and between the equity of firms and other forms of investment.

This type of argument is the justification for the theoretical work of such writers as Chambers (1966) and Edwards and Bell (1961), who are summarily dismissed by Watts and Zimmerman:

> …if accounting earnings are related to stock prices, the EMH suggests that earnings can be useful measures or indices of value contrary to the 1960's argument that earnings numbers are useless because they are not measured using a single concept of income. (Watts and Zimmerman, 1985, p. 37)

The concept of 'uselessness' or 'usefulness' here is, of course, confined to the narrow bounds of the EMH, i.e. does the information enable the investor to 'beat the market' (as determined by other in vestors)? It rules out the broader issues of usefulness, as, for example, in Modigliani and Cohn's (1979) study which claims that the equity market did not allow correctly for inflation, a situation which might have been remedied by some method of inflation accounting.[1] It also rules out the type of theoretical analysis which has been carried out recently by such economists as Fisher and McGowan (1983) and Kay and Mayer (1986), and by the UK Treasury Working Party in the Byatt Report (1986). This literature is concerned centrally with the control of state-regulated or stateowned enterprises, but it also has implications for the private unregulated sector (discussed explicitly in the Byatt Report) since an efficient allocation of resources across the whole economy requires comparison of the rates of return in different sectors and therefore, presumably, the availability of comparable information.

Unlike most of the leading contributors to efficient markets accounting research (such as Beaver, 1981 and 198la, and Foster, 1986, both of whom give very thoughtful consideration to the limitations of the EMH assumptions), Watts and Zimmerman appear repeatedly to imply that the EMH has value implications beyond fair-game efficiency of the market. For example:

> Further, given the EMH, the evidence presented in Chapter 3 suggests that the market can discriminate between efficient and less efficient firms, at least to some degree, (p. 159)

and, as a response to the 'meaningless numbers' criticism of conventional accounts:

> Positive stock price changes are associated with positive unexpected earnings and negative stock prices *(sic)* with negative unexpected earnings. Therefore, since the stock price is an unbiased estimate of value, earnings changes are measures of value changes, (p. 161)

Thus, because stock prices reflect (to some extent) reported earnings, we are invited to believe that earnings must reflect 'value' and are therefore not amenable to improvements such as might be suggeted by *a priori* theorising. Having derived such strong inferences from empirical studies based on the strong joint maintained hypotheses of the EMH and the single period CAPM, the authors have the audacity to reject market failure arguments on the ground that:

> First, they are generated in very stylized worlds and then it is assumed that they also occur in practice, (p. 167)

[1]Kennedy (1976) makes an argument of this type for current cost accounting.

However, this is, at least, a welcome relaxation of the hold of the 'F-twist'.

It is also notable that Watts and Zimmerman do not have a serious discussion of the evidence contradicting the EMH. In particular, they do not refer at all to the very balanced and thorough survey by Dyckman and Morse (1986), which is published in the same series and listed on the cover of their book. This reaches a much less decisive view of the evidence:

> Theory must become more global and testing more precise and complete before broad accounting policy solutions can stand adequately on the resulting foundation. (Dyckman and Morse, 1986, p. 90)

and

> Proponents of the EMH and its implications often claim too much while its detractors give it too little. As with most innovations, the truth lies nearer the middle ground, (p. 91)

Of course, the Dyckman and Morse book was not published when Watts and Zimmerman were writing theirs, but the first edition (Dyckman, Downs and Magee, 1975) was available and, more importantly, so was the considerable published literature on which their conclusions are based. Another notable omission from Watts and Zimmerman's bibliography is the excellent survey of market-based accounting research by Lev and Ohlson (1982). It is perhaps no coincidence that the Lev and Ohlson paper contains a powerful plea for widening the range of accounting research to consider welfare implications and for a re-examination of fundamental valuation models.

(ii) *Disclosure Regulation*

The discussion of disclosure regulation (concentrated mainly in Chapters 7 and 10, but developed and referred to elsewhere in the book) is one where Watts and Zimmerman's 'Chicago View' is particularly apparent, to such an extent that they can hardly claim that their own work is free of prescriptions: they clearly have a general view that regulation is a bad thing and the free market provides the best solution for the supply of accounting information.

The basis of the criticism of regulation in Chapter 7 is the authors' adherence to the EMH. Their use of EMH-based arguments is tendentious in the following three respects. Firstly, they ignore the considerable body of evidence that the EMH may not hold, even within its own terms (e.g. in the 'anomalies' quotation on p. 158, which has already been quoted). Secondly, they repeatedly suggest that the EMH implies that the stock market can identify 'efficient' firms rather than merely anticipating future market gains efficiently: again, examples of this have already been quoted. Thirdly, they extrapolate the rather limited aspects of the EMH which have been tested to an assumption that the information market is in a state of competitive equilibrium in all respects, so that naive investors are 'price protected', i.e. 'They buy at a price that is 'fair' in the sense that *on average* they earn a normal rate of return' (p. 160), for example 'the manager's

equilibrium compensation is reduced by the amount of profits he is expected to earn from insider trading' (p. 159).

The latter scenario is, of course, derived from strong assumptions about the world and no empirical evidence is offered for extending the scope of the EMH so far. Thus, the subsequent discussion of 'Alleged Market Failures' (p. 163 *et. seq.:* note that the authors do not have a section on '*Alleged* Market Efficiency') may be regarded as a piece of 'normative' theorising comparable with that of Chambers (1966) (although Chambers would probably claim that his theoretical argument was better developed), and the other theorists of the earlier generation criticised by Watts and Zimmerman. The comparison is particularly apt on p. 167, where the authors imitate the less appealing aspects of some of the previous generations by claiming that there are 'Fallacies in the Market Failure Rationales', when what they are referring to are differences of assumption or lack of empirical evidence rather than the existence of logical errors or other positive evidence of error.

It transpires that most of the arguments hinge on the relative costs of government regulation and private contracting, with the authors clearly *assuming* that the latter is cheaper, e.g. on the public good problem:

> If private contracting costs are greater than the private benefits to be captured, there is only a market failure if government's contracting costs are lower than private costs. No evidence has been presented to support that condition, (p. 167)

and, on the signalling problem:

> To be optimal, the signaling problem has to assume high contracting costs. However, as we have argued, if those costs are the same for the individuals and the government, there is no market failure, (p. 168)

The method chosen to adduce 'positive' evidence on these issues is as follows:

> If the government's costs are substantial, it is not apparent that there is any market failure in the private production of information in corporate accounting reports. To illustrate this point, the costs of government regulation of accounting disclosure are briefly considered, (p. 169)

What is *not* considered is the cost of private contracting. The subsequent pages add up the costs of the SEC and compliance with its regulations, but make no attempt to identify the benefits, or the additional costs of private regulation which are avoided by public regulation. Thus, the burden of proof is put on those who wish to justify public regulation, and the relative cheapness of private regulation emerges as the maintained hypothesis because 'it is not apparent that government regulation of financial disclosure improves social welfare' (p. 172).

No attempt is made to consider why voluntary standards emerge (such as GAAP) without the direct intervention of the state, and whether this suggests' that there is some perceived benefit to the participants. This is a weakness also of the discussion of

contracting in later chapters, where it is conceded that GAAP is often found to be a convenient basis for contracts, presumably because it is cheaper than negotiating detailed 'one-off' information systems appropriate to each individual contract. The authors are also silent on the framework of law which is assumed, and its benefits. Presumably, they are assuming that there will be a government created and enforced law of contracts to support their market system, and possibly also a framework of company law, but accounting regulation is a natural outgrowth of company law. It would be instructive to know where, and why, the authors believe that government created laws should be confined, e.g. we are assured that:

> Theft is also encompassed by the Jensen and Meckling analysis. Stealing by the owner-manager is analogous to the owner-manager's overconsumption of perks, (p. 185)

It might be inferred from this that areas of the criminal law are also unnecessary.

It seems likely that the authors' view would be that government intervention should always be minimised, subject to the need to provide basic support for the enforcement of contracts. Certainly their view of the political process (Chapter 10) is predictably sceptical. 'The political process is a competition for wealth transfers' (p. 222), politicians and bureaucrats are 'seeking to make themselves better off' and propose solutions artificially to generate crises based on spurious evidence to voters 'who rationally choose to remain ignorant' (p. 223). Thus, the market and political processes 'are hypothesized to differ in terms of the costs' (p. 229), the market system being assumed to be cheaper. This may or may not be true, but the evidence offered is mainly *a priori* theorising from (controversial) assumptions, which Watts and Zimmerman affect to despise, spiced with the occasional anecdote.

The positive theory of accounting choice

Watts and Zimmerman describe the development of 'a new accounting theory' (p. x.) in Chapters 8 to 14 of their book. This is essentially a theory of accounting choice, whose central concern is why managements choose various accounting techniques.

Christenson (1983, pp. 5–6) has already made the fundamental criticism of this approach, that it is really a 'sociology of accounting' rather than accounting theory, since it 'is concerned with describing, predicting and explaining the behaviour of accountants and managers, not that of accounting entities'. Of course, the sociology of accounting is a perfectly legitimate and interesting area of intellectual endeavour. What is disturbing is the possible implication that it might be pursued to the total exclusion of other studies concerned with the fundamental problems of reporting the financial transactions and states of accounting entities. Christenson draws an analogy with chemistry:

> Chemical theory consists of propositions about the behaviour of chemical entities (molecules and atoms), not about the behaviour of chemists. (Christenson, 1983, p. 6)

If we ignore Watts and Zimmerman's tendency to rule out other approaches to accounting theory in their enthusiasm for their own, we can accept that their theory of accounting choice is interesting and potentially fruitful, but it is also, at present, rudimentary. On this point, the authors tend to disarm criticism by admitting the limitations of the theory and the ambiguity of the empirical results achieved so far. They also suggest future extensions and improvements (particularly in Chapter 15). The reader's main regret may be that they do not adopt a similarly sympathetic approach to alternative approaches.

The discussion of the empirical results (Chapter 11) is perhaps the most balanced. Although the authors occasionally commit themselves to over-enthusiastic interpretation (e.g. in their claim that 'Zmijewski and Hagerman's results provide strong evidence', p. 256) and even error (Table 11.5 contains a numerical error which makes it inconsistent with the text, and the title of the paper is incorrectly quoted, despite the fact that it was published in Watts and Zimmerman's own journal), they provide a useful critical survey of recent literature. They also seem to have accepted some of the strong criticisms made of their own work (Watts and Zimmerman, 1978) by Ball and Foster (1982), especially in the interpretation of the size variable.

However, it must be said that much of this empirical literature really does need to be reported critically, because there is a great deal of *ad hoc* empiricism. This involves the use of variables which are at best proxies for the likely true explanatory variables and are at worst merely things which might work (in the sense of correlating with the dependent variable). Moreover, the specifications of the models commend themselves for their simplicity rather than their theoretical plausibility, e.g. linear additivity is a popular specification (and, to be fair to the authors, this is acknowledged on p. 358). The latter may be a natural consequence of the 'positive' approach if it emphasises empirical predictions (i.e. obtaining high coefficients of determination) rather than *a priori* theoretical reasoning (i.e. estimating models which have theoretical specifications derived from plausible assumptions).

With regard to the positive theory of accounting choice, its narrowness has already been mentioned, but it seems that even within its narrow confines it could be developed further than the authors suggest (e.g. in their final chapter). This might, however, involve dropping some of the authors' most treasured assumptions. For example, as indicated earlier, the issue of why many contracts voluntarily adopt GAAP is worthy of further exploration. This does suggest that some form of widely agreed standard accounting information is considered cost-effective relative to 'bespoke' information unique to each contract and each firm. This could be due to preparation costs but might well also be due to information processing costs of the user. At an empirical level, it might be possible to identify different types of contracts or firm (e.g. classified by industry) where these costs would be expected to be high, and it would then be possible to test whether these firms (or contracts) tended to have a higher incidence of using GAAP (although it may well be that all firms use GAAP). The result of such a study might be a vindication of some degree of standardisation of accounting, although not necessarily by the government.

Two other issues, lurking underneath Watts and Zimmerman's discussion of the theory of accounting choice, deserve some discussion. First, if, as some of the empirical evidence suggests, accounting standards which restrict accounting choice reduce firm value, why, in a world of efficient markets, does this occur? The assumption seems to be

that the reduction in firm value is a deadweight loss (i.e. there are no gainers) so surely the contracts should be drawn up in such a way as to avoid such losses (i.e. the contracts should be flexible enough to avoid the effects of future changes in accounting standards) or they should be renegotiated when the prospect of an unanticipated loss appears. Of course, some of the losses may be due to external factors which cannot be dealt with by negotiation (notably the political threat) but this is not true of debt contracts and compensation contracts which feature strongly in current theories.

Secondly, is there also a 'fundamental' rationale in the terms of these contracts and, in particular, their choice of accounting variables? After all, management compensation contracts are intended to provide incentives for managers to act in shareholders' interests, and debt contracts are designed to protect debt holders from the consequences of insolvency. Presumably if such contracts use profit measures, they are using them as proxies for the future cash flow earning potential of the firm, which in turn can be related to the long-run profitability or the net present value of the firm. This leads back into the theoretical debates of the 1960s which Watts and Zimmerman reject as 'normative', but in doing so they are also rejecting a whole area of possibly interesting and useful empirical research, e.g. does the form of contract or form of accounting information which it uses have any bearing on the future success of the firm (e.g. future growth of share price, in response to managerial compensation, or future solvency, in response to debt contracts)? This is particularly unfortunate because Watts and Zimmerman themselves, despite their efficient markets rhetoric, clearly have a fundamental valuation model at the backs of their minds:

> Using the theory, investors or analysts do not interpret balance sheets and earnings numbers as unbiased estimates of firm value and changes in firm value…(p. 356).

and (later in the same paragraph):

> …an investor or analyst could adjust the earnings number for expected management manipulations in deriving cash flow estimates. This would help the investor or analyst better predict the market value of nontraded stocks and bonds.

Conclusion

Watts and Zimmerman have written a stimulating account of an important line of accounting research to which they themselves have made a major contribution. The principal deficiency of their book is that, in their enthusiasm for their own preferred type of work they denigrate the work of earlier accounting theorists and other contemporary researchers who adopt a different approach. This is unfortunate because it is unnecessary and tends to divert attention from the central issue, that *all* approaches to accounting theory are, at the present time, in a fairly rudimentary stage of evolution and desperately need further constructive development. Moreover, in their enthusiasm, they tend to ignore or forget the restrictive assumptions and relatively narrow focus of their own work. This

creates the danger that they may never explore the full potential of studies of choice of accounting method.

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IS ACCOUNTING BECOMING TOO INTERESTING?

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'Some Statistical Problems in Accountancy'

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IS ACCOUNTING BECOMING TOO INTERESTING?

Geoffrey Whittington

Introduction

Goethe once wrote that (roughly translated), double entry accounting is one of the finest inventions of the human spirit (Chambers, 1983). Unfortunately he was joking. Accounting has a reputation for being boring. I must admit that, in the past, I have shared that view: I left the accounting practice on the day my articles expired (this was in the days of articled clerkship rather than training contracts) vowing never to enter an accountant's office again. I did not quite keep this vow, but I have never since been employed in professional practice. I did, however, decide, after ten years as an academic economist, that accounting research had become interesting enough to persuade me to return to academic accounting, as Professor of Accounting at Edinburgh, in 1972. Since then, accounting in universities and in professional practice has expanded, changed, and become more interesting. In some respects, the extent of this change is such that I sometimes think that accounting is becoming too interesting, and this is the theme of my lecture.

The ancient Chinese curse is supposed to be "May you live in interesting times". I take this to imply that interesting times are ones which bring great change and great opportunities, but the opportunities are for things to deteriorate as much as to improve, and change brings great uncertainty. If we accept the fundamental axioms of finance theory, then we believe that most people have a considerable aversion to uncertainty. The big changes in accounting during the past 20 years or so have been driven by a much greater demand for the services of accountants, which have led to their influence extending into new areas. For example, the recent (1994) Green Paper on the control of government expenditure proposes that central government should adopt accrual accounting, consistent with the generally-accepted accounting practices used for many years in the private sector. The Chancellor of the Exchequer has hailed this as the greatest reform since the time of Gladstone. Others, such as Michael Power (1994), are critical of the extension of accountants' influence and values, which are producing what Power calls "the audit explosion".

Whatever the merits of the extension of the influence of accountants, there has certainly been a considerable enlargement of the accountancy profession, to such an extent that it has become one of the leading recruiters of U.K. graduates, particularly those with good degrees. Professional firms, particularly the "Big Six", have grown and diversified their activities and concentrated their market power by merger (ten years ago, they were the "Big Eight"). There has also been great change and controversy over the traditional concerns of the accounting profession in financial accounting and auditing. The Accounting Standards programme, initiated in 1970, has produced a substantial

volume of new regulation, and the original Accounting Standards Committee has been replaced by the Accounting Standards Board, which has greater independence from the professional bodies. Books on creative accounting have become best sellers: when I was an articled clerk, it was unthinkable that books on accounting would be read for any purpose other than getting through professional exams, and these certainly did not have anything creative in them.

There have been parallel developments in auditing, the accounting profession's staple activity. The Auditing Practices Committee was set up to set auditing standards, and has subsequently been replaced by the Auditing Practices Board, which has a much wider non-auditor membership, although it is still sponsored by the professional bodies. The professional bodies have also been given the responsibility for monitoring the conduct of audits by their members, and their effectiveness in doing this has recently been brought into question by Prof. Moizer's report to the Department of Trade and Industry. Such issues as the independence of auditors, the size of their non-audit earnings, and their responsibility to seek out fraud, are all topics of current public debate.

The public level of debate on such matters was unheard of thirty years ago and was considered revolutionary when Professor Stamp started his campaign for accounting standards in the late 1960s. Now, we have weekly published reports of the latest problems of the profession and its members from *Accountancy Age*, the *Private Eye* of the accountancy profession, and two leading national newspapers, *The Times* and *The Financial Times*, run weekly accountancy columns. Financial scandals, such as the failures of BCCI, the Maxwell companies and Polly Peck, are headline news, and the auditors are among the first to be blamed, even when they are not at fault: they must envy the public relations of the medical profession, which is rarely blamed for causing, or not preventing, illness and death. Thus, accounting has become interesting to the public outside the profession, and many people within the profession find the glare of publicity to be unwelcome—in fact, they feel that accounting has become too interesting.

The issues which I have raised so far are complex, worthy of much more research, and certainly not amenable to proper analysis or discussion within a single lecture. The rest of the lecture will focus on two related aspects of the total problem: the development of academic accounting within universities, concentrating on the "old" universities, and the development of the accounting profession narrowly defined to include only the firms engaged in public practice as auditors and concentrating on only one professional body, the Institute of Chartered Accountants in England and Wales (ICAEW). This parochial focus is necessary, not only to make the scope of the discussion manageable, but also because the Speaker's own experience is as a member of the ICAEW and as an academic.

The Development of Academic Accounting

Let us start by considering what has happened in universities within the last 20 years or so. This may seem to be a retreat to the ivory tower, where nothing changes and the interest is purely academic, but this is not so. Universities have changed drastically since the expansion proposed by the Robbins Report (1963) and the subsequent financial attrition as government expenditure constraints became tighter. This culminated in the creation of unified funding councils (the HEFCs) for all higher education institutions, and

the merging of the polytechnics into the university sector as "new universities". A cynic might suggest that the main purpose of this was not to benefit old or new universities, but to increase the headline number of university places and to introduce an element of "yardstick competition" into the university sector (the polytechnics having lower costs per student). However, that, and the rest of the recent history of universities, is outside our self-imposed terms of reference. What is of interest is that, within the "old" university sector, teaching and research in accounting have expanded substantially, in response to strong demand for student places. Not only have more universities (including Cambridge) adopted accounting as an academic subject, but existing accounting groups have expanded rapidly.

By way of illustration, consider Table 1. This extends data used in the Solomons Report (1974) to the present day. Solomons selected a group of accounting departments (or sub-departments) in fairly large traditional universities, to show how accounting was under-supported relative to Law and Engineering. The 1994 figures (taken from the BAR *Accounting Research Register*) show that, in those universities, the number of professors of accounting has almost trebled and the number of other accounting staff has doubled. Given the general decline in staff/student ratios since 1972, we may assume that student numbers have expanded substantially, even before we allow for the creation of new departments and the activities of the former polytechnics.

The change has not, however, simply taken the form of enlargement of what was there in 1972. A clue to this will be found in the affiliations of the twelve departments: in 1972, six were parts of larger economics departments, but, by 1994, only three of those remained in economics departments, and six of the twelve were parts of management departments or schools. This reflects the increasing attraction of vocational subjects and the growing popularity not only of the accounting profession, which is a traditional British preparation for a business career, but also of management degree courses which are now becoming a recognised direct route into business.[1]

The interests and qualifications of U.K. academics in accounting departments have also changed from a concern with how accounting is, or ought to be, done, to a wider concern with the context in which accounting operates. This is reflected in the proportion of academics in accounting departments who have professional qualifications. Of the 42 professors in our twelve departments in 1994, 23 were members of accountancy bodies affiliated to the CCAB, as were 64 of the 136 non-professorial staff. Thus, almost exactly half of the academic staff were professionally qualified: slightly more than half of the professors and slightly less than half of the rest. The higher proportion of professors who are professionally qualified may reflect their greater age: a higher proportion of those entering academic departments recently has lacked a professional qualification, and this has been compensated for, to some extent, by a higher level of formal academic qualifications. This is confirmed by a recent study by Gray and Helliar (1994), which covers the full population of U.K. accounting academics (Table 2). This study also shows that the accounting staff of new universities have a greater proportion of professional qualifications and a lesser proportion of higher degrees, which is consistent with their tradition of offering more courses which are directly related to professional qualifications. The key statistics are summarised in Table 2.

TABLE 1

Full-time academic staff in selected university departments of accounting, 1972 and 1994

	Professors		Other Academic Staff	
	1972	**1994**	**1972**	**1994**
Birmingham	2	5	6	12
Bristol	1	2	4	6
Exeter	–	3	1	6
Lancaster	2	5	7	9
Leeds	–	2	5	10
Liverpool	–	1	2	6
Manchester (including UMIST)	3	6	12	27
Southampton	1	5	4	12
University of Wales (Cardiff)	1	4	2	13
Edinburgh	1	3	4	7
Glasgow	1	3	11	14
Strathclyde	1	3	8	14
Total	13	42	66	136

Source: 1972 Solomons (1974), Table 2.1
1994 Gray and Helliar (eds.) (1994)

TABLE 2

Number and qualifications of UK accounting academics

	Old universities		New universities	
	1986/7	**1990/91**	**1986/7**	**1990/91**
Number	420	599	620	772
Professional accounting qualification (%)	66%	52%	85%	73%
Master's degree (%)	63%	65%	46%	45%
PhD (%)	30%	32%	3%	4%

Source: Gray and Helliar (1994), Table 3.

Accounting Research

The diminishing professional background of academic teachers of accounting mirrors the ever-broadening nature of accounting research, as well as the teaching needs of a wider syllabus.

Early academic accountants, such as Dicksee at the London School of Economics (LSE) and the early Scottish professors, were practitioners whose research consisted of systematising practice in books such as Dicksee's *Auditing* and articles in professional journals. Their main discipline, other than the techniques of accounting, was typically the law, which provided the institutional framework for their activities in auditing, accounting, taxation, and insolvency. Later, economics had a strong influence, notably, in the U.K., the LSE school of business economics in the 1930s and onwards (Whittington,

1994), which led to the economic analysis of income measurement systems in financial accounting and of cost measurement in management accounting. There were parallel developments in other countries, such as the U.S.A., the Netherlands, and Germany.

Economics has continued to have a strong influence on accounting. Recent contributions include agency theory and information economics, but the most important has been finance, particularly the empirical models of share price determination which underlie innumerable market reaction studies of the effects of financial accounting information and, in management accounting, the capital budgeting model which is now even a standard part of the professional accounting syllabus.

There has been a remarkable widening in the range of disciplines applied to accounting during the past three or four decades. The advent of the computer made computer information systems an important topic for the practical accountant as well as the researcher. It also increased the potential for mathematical and statistical modelling. Mathematical optimisation techniques such as linear programming were applied by researchers to the analysis of costing and allocation decisions (Carsberg (1969), Samuels (1965)). Statistical techniques such as regression analysis were proposed for estimating variable costs and statistical sampling was applied to auditing. It also became apparent that mathematical optimisation was unlikely to solve all the problems of management accounting, because organisations are based on relations between people, who may react to the accountant's information in a way which was not anticipated. This led to studies of the effects of accounting within the context of the organisation, in activities such as budgeting, divisional performance evaluation and costing. Thus, disciplines such as social psychology and sociology became relevant to the accounting researcher. In the context of financial accounting, it became apparent that the choice of accounting method can be motivated by self-interest, and that accounting standard-setting can be regarded as a political process. This line of research also called on a wide range of social science disciplines, and philosophy has been called upon to analyse the nature and status of conceptual frameworks for financial accounting (Mumford and Peasnell (1993)). Another subject which has blossomed is accounting history. This started as simple biography of individual accountants or their firms, but has extended its range to include the analysis of the role and development of accounting in the broader context of society and the economy (Napier (1989)).

All of these developments make accounting a much more exciting subject for the researcher, and possibly even for the student. However, there are possible dangers that the research is becoming "too interesting".

Seven years ago, Professor Baxter (1988) published a paper entitled *Accounting Research—Academic Trends versus Practical Needs*. After surveying the developments which I have just described, he delivered a critical judgment, that an unfortunate gap had developed between accounting research and accounting practice. I thought at the time that Professor Baxter had overstated his case and I wrote a critical review of his paper. I also wrote a paper showing how the professional examinations had changed over the past quarter of a century and demonstrating that many of the innovations were not even taught in university accounting courses at the beginning of the period: surely an argument for a wide syllabus and wide research interests if universities are to produce students and insights capable of helping to deal with future problems (Whittington, 1989).

I am now reminded of Mark Twain's remark that, at the age of fourteen, he thought that his father was remarkably ignorant, but that by the age of twenty-one he was amazed how much the old man had learned in seven years. Professor Baxter is an academic father to several generations of LSE graduates, and I am amongst them. Although I do not agree with everything which he wrote in 1988, I think that I do now have a deeper appreciation of his message. This mainly stems from my experience as Academic Adviser to the Accounting Standards Board (1990–94) and, more recently, as a member of the Board. Bearing in mind the vast increase in the volume of academic research, remarkably little is directly relevant to the work of the ASB, and our discussion papers and exposure drafts attract a negligible response from academics. I conclude from this that financial accounting research is becoming unbalanced in its scope: too much attention is paid to the economic and social context of accounting and too little to the techniques of accounting itself.

This situation is the result of two distinct strands in accounting research, which have attacked research at what I would call the heart of accounting (its methods and techniques) from two opposite sides, which might be described roughly as the "right" and the "left" of the political spectrum.

From the "right", the Chicago/Rochester School has developed a very successful empirical research programme, using stock market models to estimate the impact of accounting information on investor behaviour. The classic paper by Ball and Brown (1968) set in train more than a quarter of a century of empirical research endeavour which has filled the leading American journals. This has developed into empirical studies of accounting choice, which attempt to explain choice of accounting methods in terms of the self-interest of preparers of accounts. Watts and Zimmerman (1986) have summarised very ably the pioneering literature in this field, describing it as "positive accounting", and have intolerantly dismissed the value of "normative" accounting, which includes evaluating the methods of accounting from a theoretical standpoint. They seem to forget that their own empirical studies are equally based upon theoretical assumptions. The academic journal most favoured by this school of thought is the *Journal of Accounting and Economics*.

From the "left", the practice of accounting is put in a social and political context, and various philosophical, political or sociological categorisations are used to explore such issues as how accountants gain power by monopolising information and shaping it to meet their ends, and how the accounting profession has developed to serve the interests of its members. There is no doubt much truth in all of this, and an intelligent practical accountant can learn a great deal by studying it: too often professionals tend to believe that what is good for them is good for society (and so do academics). It is also entertaining reading when the sociological and philosophical jargon is kept in check, which is more than can be said for the statistical efforts of the "positive" school. An example is Tinker's *Paper Prophets* (1985). However, this, too, tends to devalue the practice of accounting, emphasising rather that accounting is a highly subjective means of expression and of exercising power. The test of accounting is in its effect on society or social relationships, rather than in its ability to provide a consistent account of economic events and transactions, within the particular institutional context which exists at the present time. Some radical examples of this type of work appear in *Critical Perspectives on Accounting*.

Thus, both of these broad approaches to accounting research explore the context rather than the content of accounts. They are both, in my view, valid and interesting areas of accounting research, and I would not wish to denigrate them in any way. I do, however, worry that they may be crowding out research into the methods of accounting, partly simply as a consequence of their own success, but partly also because of a degree of conscious intellectual imperialism. Watts and Zimmerman's attack on "normative" theory is an example of this. A less serious example of criticism from the other side was a referee's comment which I received last year on a dull but hopefully worthy study of the Auditing Principles Board. I was enjoined by the referee to impose a critical analysis in the manner of Lukes, Goering is supposed to have said "when I hear the word 'culture', I reach for my gun". I am not so violent, so when I hear words I do not understand, I reach for my *Fontana Dictionary of Modern Thought*. The entry was not as helpful as most. The nearest I could find was:

> Lukacs, Georg or Gijorg (Hungarian philosopher and literary critic 1885–1971) see under CHARACTEROLOGY; NEO-MARXISM; REIFICATION.

I did not re-write my paper on "the APB as an example of neo-Marxist Reification" or "Auditing Standards as Characterology: a Lukacsian critique", although such titles do go down rather well with some editors. I did, however, feel fairly strongly that I am entitled to study the APB, and able to say interesting things about it, without the aid of Lukacs. Subsequent research (in my second line of defence, *The Social Science Encyclopedia*, Kimper and Kimper, 1989), revealed that the reference was in fact to Lukes (1974), a sociologist who has written on power relations and has not yet reached Fontana status. This led me to regret a missed opportunity: I might have made a reputation in critical accounting by pioneering the Lukacsian critique.

To return to the central theme, there are some very interesting and intellectually challenging problems facing accounting standard-setters at the present time, and there is a dearth of relevant academic research available. The ASB is at present engaged on projects to improve accounting for financial instruments, pension costs, deferred taxation, future events, intangible assets and goodwill, associated companies and joint ventures. There are some fascinating problems involved, which Lukacs never dreamt of (neither did Foucault, who was the "researcher" ninth most-cited in leading accounting journals in 1987, Beattie and Ryan (1989)). Positive accounting cannot tell us much either: we cannot assess the stock market impact of an accounting method until we have chosen it, and a stock market impact is not, in any case, the only test of an accounting standard. Some researchers are doing relevant work (including some at Aberystwyth), but more would be welcome. This problem is not unique to the United Kingdom. In the USA, the American Accounting Association has established a new journal, *Accounting Horizons*, to bridge the gap between academic research and practical problems (Zeff (1989)).

Nevertheless, there can be no doubt that recent developments in research have helped to broaden our horizons and have even provided some entertainment. I cherish the thought of the enthusiastic academic accountant who, when asked to address a stony-faced group of senior practitioners, started his talk by urging them to drop their

presuppositions about accounting and, instead, to look at accounting as "a subjective construct, floating in social space".

The Accounting Profession

The development of accounting in universities has not been purely supply-driven. The number of accountants in the UK has grown rapidly and accounting is still the most popular route into a business career, despite the recent challenge from the growth of business studies degrees, particularly MBAs. Professional firms have not only grown in size, by merger, but they have also grown by developing their non-auditing activity.

Table 3 provides a profile of the recent development of one of the "Big Six" firms of chartered accountants, Price Waterhouse, which also happens to sponsor my chair in Cambridge. The Bix Six are always telling us that each has a different style, but over-emphasis of the differences between them may be a competitive stratagem which tends to mask the similarities. I shall therefore assume that Price Waterhouse has developed in a manner which is broadly representative of the recent development of Big Six firms. This is supported by Table 4 which shows that, currently, Price Waterhouse is not unusual amongst the Big Six in having a high proportion of fees derived from non-auditing activities. The features of the real growth of Price Waterhouse which deserve particular attention in the context of our "too interesting" theme and which seem, on the basis of casual observation, to apply to the other five also, are:

(1) Strong growth of the total business, far in excess of the growth of national GDP during the period.
(2) Particularly strong growth of non-audit activities. Although data are not available, it is reasonable to infer that there has been growth in the number of professional staff with accounting qualifications, but even greater growth in the number of professional staff with non-accounting qualifications.

These developments are partly due to the enterprise of professional accountants: a property with which they are seldom credited by the general public. However, they are also a response to the demands of the market place. The freeing up of markets during the past two decades has led to a number of developments, such as the growth of transnational businesses, the development of a truly international capital market, and a high level of take-over activity, which have called for new forms of financial advice, and accounting firms have been leaders in providing this service. There have also been some novel forms of work, such as privatisation work, which were unheard-of twenty years ago but are now big business in the UK and, increasingly, abroad.

TABLE 3

The growth of Price Waterhouse, 1975–94

Year[1]	Total Fees	Break-down of work (%)[2]			
	£'000	ABS	Tax	MCS	Insolvency
1975	14,160	86.5	8.9	3.2	1.4
1980	41,682	79.6	12.0	4.2	4.2

1985	94,292	59.0	19.4	16.8	4.8
1990	320,809	38.5	24.8	28.8	7.9
1994	384,000	38.1	28.2	21.3	12.4

Notes
(1) The financial year changed in 1988.
(2) Break-down of work is by chargeable hours for 1975 and 1980 and by fees for later years.
ABS is Auditing and Business Advisory Services, and therefore includes some non-audit work.
MCS is Management Consultancy Services.
Insolvency includes corporate finance and reconstruction, and privatisation.
Source: Price Waterhouse Reporter (house journal) and draft History of the Firm. Data supplied by the Price Waterhouse Corporate Communications Department.

TABLE 4

Fee Income of the Big Six professional firms, 1994 (£m)

Firm	Total Fees	Audit & Accounting	Taxation	Management Consultancy	Insolvency
Coopers & Lybrand	560.0	253.0	121.0	124.0	62.0
KPMG Peat Marwick	497.6	200.1	108.7	70.9	47.9
Arthur Andersen	433.3	81.7	67.9	252.6	31.1
Ernst & Young	388.4	167.6	110.1	70.4	40.3
Price Waterhouse	384.6	158.8	107.4	83.3	35.1
Touche Ross	342.5	134.9	82.4	69.5	39.4

Source: *Accountancy Age*, 9 June 1994, p.1.

Professional firms are inclined to describe these new developments as opportunities rather than threats. However, there is a danger of things becoming "too interesting" from the perspective of the accounting profession, and particularly with respect to auditing. Firms whose main business, in revenue terms, lies outside auditing may come to regard auditing as a "loss leader" which is justified mainly by its ability to generate more lucrative add-on services. Interesting evidence of this danger has been provided by the recent requirement for companies to report payments to auditors for non-auditing services. Clearly, if auditors became too dependent on non-auditing income, their independence as auditors would be compromised: company directors who can offer lucrative consultancy contracts have a means of rewarding auditors who are accommodating to them in the conduct of the audit. I have argued elsewhere that this apparently "cosy" relationship is not necessarily a bad thing (Grout, Jewitt, Pong and Whittington, 1994), provided that a closer relationship between directors and auditors is offset by heavier penalties for auditors who err too much in favour of the directors in the conduct of the audit. The first part of this message is welcome to auditors, but the second is not, at a time when audit firms feel that they are already exposed to the risk of excessive legal damages and one leading firm, KPMG, is actively contemplating incorporation, with limited liability, "to protect the partners' assets" (*Accountancy*, January 1995, p.36, interview with Colin Sharman, Senior Partner at KPMG).

Of course, the "Big Six" audit firms are one extreme of the practising profession, albeit one of increasing importance[2]. However, it is reasonable to assume that most auditing firms have increased their range of financial advice and services in response to changing demand, and that this demand extends to the smaller client as much as the international corporation. Indeed, the small accounting practitioner has always provided a broad range of advice to his clients, rather analogous to that of a general medical practitioner to his patients. This is because the smaller client is less likely to have in-house expertise in such matters as computer systems, taxation, and sometimes even in accounting: to distinguish clearly between accounting and auditing services is a luxury which can be afforded only when the accounts are well kept.

As an example of the range of services provided by the modern auditor, I can quote the example of my College, which recently held a tender for its audit. All of the candidates stressed their expertise in non-audit areas, such as taxation and the design of information systems. One firm went so far as to say that its catering specialists could improve the running of the college kitchens. I was tempted to ask if they also provided painting and decorating or window cleaning services, but I decided against it for fear of eliciting a positive answer! There is, of course, no reason why a modern financial services and management consultancy firm (which is what many accounting firms aspire to be) should not have an office maintenance and cleaning subsidiary, and I expect that this will happen (if it has not happened already). However, it does take us some way from the view of auditing as a clearly-defined profession in which the auditor is "selling" the skill of professional judgment, exercised independently, in the cause of ensuring that the accounts show a "true and fair view" of the state of affairs of the company.

The widening interests and responsibilities of professional firms have been reflected in the experience of professional bodies during the past two decades. The six professional bodies in the UK have all experienced considerable change in membership, in the responsibilities of members, and in the need to respond to regulatory pressures. All of this has made life interesting, and sometimes "too interesting" for the councils and staff of the professional bodies. The substantial growth in membership of professional bodies is recorded in Table 5. I shall concentrate my comments on the ICAEW, for the reasons given earlier: this is the dominant body in terms of professional practice in England and Wales.

Table 6 gives details of recruitment to the ICAEW and its student body. The following striking features emerge:

(1) Admission to membership has increased over a long period and shows no sign of abating, despite showing a short-term cyclical pattern.
(2) The proportion of women recruits has risen and continues to rise. This will hopefully make the ICAEW "more interesting" in terms of breadth of membership, and it is one development that does <u>not</u> threaten to become "too interesting".
(3) The proportion of graduates rose dramatically between 1972 and 1984, reflecting the growth of employment for highly skilled people which is offered by the professional firms, the wider opportunities offered by a professional qualification, and the higher educational standards required.
(4) The quality of graduates, as measured by degree class (and also by 'A' level "score", which is widely used by professional recruiters) has improved notably in recent years, reflecting the increased popularity of the profession (it is seen to be more

"interesting") and possibly also the increased emphasis by recruiters on intellectual skills (interesting professions require intellectually able practitioners), particularly in a tight labour market which is well supplied with good applicants.

(5) The proportion of business studies graduates has increased steadily in recent years. "Business studies" includes specialist accounting degrees and the typical business studies student will have studied at least some accounting at university. It seems likely that this development is largely supply-driven: students who choose to read business studies at university are more likely than others to wish to become accountants. From the demand side, the recruiters and partners of professional firms tend, if anything, to prefer students who have not studied accounting at university. This is partly a matter of habit and partly because accounting has only recently been taught at Oxford and Cambridge and is still not well established there as an undergraduate subject. However, the habit is clearly changing.

TABLE 5

Membership of the six principal British and Irish Accounting Bodies

	1972	**1982**	**1994**
Institutes of Chartered Accountants:			
in England and Wales (ICAEW)	54	76	106
of Scotland (ICAS)	9	11	14
in Ireland (ICAI)			259
Chartered Association of Certified Accountants (CACA)	14	26	45
Chartered Institute of Management Accountants (CIM A)	13	21	37
Chartered Institute of Public Finance and Accounting (CIPFA)	7	9	12
	99	148	223

Sources: 1972: Solomons Report, p. 6.
1982: Renshall (1984), p. 25.
1994: Members' handbooks of professional bodies for 1994 (precise dates of membership count vary).

TABLE 6

Statistics of membership of the Institute of Chartered Accountants in England and Wales (ICAEW)

1. Admissions to membership						
Year:	**1884**	**1934**	**1964**	**1974**	**1984**	**1994**
Female members	–	10	25	160	617	1,555
Male members	79	576	1,591	2,979	2,115	2,920
Total:	79	586	1,616	3,139	2,732	4,475
2. Student intake						
Year:	**1969**	**1972**	**1984**	**1986/7**	**1989/90**	**1992/3**
Total intake	4,232	5,565	5,171	6,287	6,894	4,074
Less non-graduates	3,418	3,863	661	699	706	357
UK graduates	814	1,702	4,510	5,588	6,188	3,717
Of whom:						

Business studies (%)	N/A	N/A	N/A	42.3	46.9	50.4
Good honours degree (%)	N/A	N/A	44.3	49.0	50.4	73.6

N/A=Not Available

Sources: Data provided by Mr. A.J.Colquhoun, Secretary and Chief Executive of the ICAEW, supplemented for 1969 and 1972 by data from the Solomons Report, p. 44.

This pattern of recruitment demonstrates the increasing importance of the accounting profession and its responsibility in providing the first practical business training for some of the best brains in the country. It may also suggest that accounting is becoming more interesting to intelligent people. I tested this theory some years ago when I gave an induction talk to the academically elite group of new students on the Bristol University course in Economics and Accounting. When I asked 42 students how many thought that accounting would be interesting, only seven hands were raised in support. When I asked them whether they thought that accounting would lead to a well-paid job, all 42 students raised at least one hand: some raised both. Thus, if accounting is interesting to students, the prospect of money may be the most highly weighted explanatory factor.

Whatever its motivation, the influx of a large number of academically talented young members of the ICAEW ought to be good for the future of the profession. Human capital is the stock-in-trade of a profession, as well as of a professional firm. Moreover, the influx of business studies graduates gives some hope that the gap between academic research and professional practice will be bridged, if not narrowed, i.e. we may hope that future accountants have a better idea of what accounting is about, even if they are no better at understanding and improving the methods of accounting than were their predecessors. This might serve the profession well in helping to reduce the strong anti-intellectual tradition in the ICAEW: too many senior members at present regard accounting as a way of making a living rather than something which is actually worth thinking about.

The future of the ICAEW cannot, however, be viewed with unalloyed optimism. There are three long-running pressures which will continue to make life for the Institute ever more interesting: integration of the accounting profession, the apparent alienation of many individual members, and regulatory pressures.

The integration of the six CCAB professional bodies, or sub-groups of them, has been proposed several times within the past quarter of a century. It has failed every time, due to such factors as the national pride of the Scots or the jealous protection of the title Chartered Accountant by ICAEW members relative to the “non-chartered” bodies (which now have acquired royal charters but are not allowed to call their members “chartered”). The CCAB has been a vehicle for some co-ordination, particularly on standard-setting, but it is still inefficient and odd to an outsider that there are, for example, four different U.K. professional bodies whose members may acquire a practising certificate to audit companies.

The alienation of a large number of members of the ICAEW has been apparent for many years and has been blamed for everything from members’ resistance to higher subscriptions to the rejection of current cost accounting. The growth of membership and its wide spread both geographically and in terms of business interests must be one cause of this problem. The ICAEW’s senior officers tend to be drawn from the large professional firms and to be based in London: perhaps the large firms can spread the cost of non-chargeable time more easily, and a London base makes attendance easier. The big

firms tend to think that this is very public-spirited of them. The members of small practising firms and non-practitioners tend to think that the big firms are running the Institute in their own interest.

Regulation is an area in which these interests may clash. The ICAEW was the initial driving force behind the regulation of accounting standards, through the ASC, and auditing standards, through the APC. Subsequently, the CCAB was formed, and through it all six accountancy bodies became involved in standard-setting. The profession's role in accounting standard setting declined with the formation of the Financial Reporting Council and the ASB in 1990, and the APC was, shortly afterwards, replaced by the APB, which is less dominated by accountants in public practice but still controlled by the CCAB. It remains to be seen whether the self-regulatory pattern of the APB can be sustained, or whether it will become necessary to distance it further from the control of the accounting profession. Radical critics, such as Austin Mitchell and Prem Sikka, argue that the self-regulatory structure of the APB is a means by which auditing firms, and particularly the large auditing firms, can maintain control over auditing standards in their own interest. More recently, the professional bodies have taken on duties for monitoring their own members' conduct of audits. This power is delegated to them by the DTI, under the 1989 Companies Act, and a recent report to the DTI by Professor Peter Moizer has revealed shortcomings in the system which have again led to criticisms of self-regulation. Thus, the choice between self-regulation (the APC and the ASC), independent private sector regulation (the FRC and the ASB) and public sector regulation (a UK version of the American SEC) is likely to be a continuing topic of debate in the future.

Conclusions

I have touched on a wide range of issues, somewhat impressionistically and using only partial or even anecdotal evidence. My object was to show something of the range of interesting issues which confront accountants both in universities and in the world of business. I hope that I have demonstrated that accountants live in interesting times for their profession and that these interesting times are also reflected in academe.

I have also expressed anxiety that the increasing breadth of research into the context of accounting may be distracting the effort of researchers away from some of the central problems of how accounting is done or could be done. However, I have also noted that the interests of accountants in what we sometimes call "the real world" have also broadened. Accounting firms are becoming much more than mere audit practices and their activities stretch far beyond accounting. Thus, an optimist might say that research was responding to the demands of the market place and, moreover, that this was reflected in the healthy demand for accounting and business studies graduates.

However, I think that this interpretation of events would over-estimate the power of market forces. With regard to academic research, I think that this is driven by the choices of academics themselves, and, as a self-interested academic, I think that this is no bad thing, even if the result does not help me to solve the ASB's problems. Students, it seems to me, choose their courses often with careers in mind but possibly with an ill-informed view of employers' attitudes to vocational business courses, and also in ignorance of the contents of their chosen degree courses. However, I hope that this ill-informed choice

often leads students to take courses which they eventually find to be quite interesting and which do prepare them, in the longer term, for fruitful careers, even if employers do not initially appreciate these benefits.

With regard to the accounting profession, this has certainly been very successful in attracting good recruits and in producing professional firms which have been dynamic, financially profitable, and internationally competitive. The firms themselves will need in the future to resolve the tension between their professional traditions and their increasingly commercial orientation. Professional bodies also need to address their own structure and governance, and their role in regulation.

All of this is certainly interesting. Is it too interesting? I expect the correct response of the youthful and the dynamic is "No, it is an opportunity and a challenge". Thus, the answer depends on whether the respondent is youthful and dynamic. I must confess to occasional bouts of timorous middle age, but I leave it to you to form your own conclusions.

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