ADVANCES IN INTERNATIONAL ACCOUNTING

Volume 17

J. Timothy Sale

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ADVANCES IN INTERNATIONAL ACCOUNTING VOLUME 17

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First edition 2004

British Library Cataloguing in Publication Data
A catalogue record is available from the British Library.

ISBN: 0-7623-1127-4
ISSN: 0897-3660 (Series)

♾ The paper used in this publication meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper). Printed in The Netherlands.

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LARGE ACCOUNTING FIRMS' SURVEY REVEALS EMERGENCE OF "TWO STANDARD" SYSTEM IN THE EUROPEAN UNION

Donna L. Street and Robert K. Larson

ABSTRACT

Convergence with International Financial Reporting Standards (IFRS) as promulgated by the International Accounting Standards Board (IASB) is receiving great attention. In 2005, all listed companies domiciled in the European Union (EU) will be required to prepare consolidated accounts based on IFRS. Individual EU member states are, however, permitted to decide whether IFRS will be required or allowed for non-listed companies or for listed companies' individual accounts. Based primarily on data collected by the six largest international accounting firms during their most recent convergence survey, this paper examines each of the 15 EU member states' convergence plans and their perceived barriers to convergence.

The findings indicate that most EU members do not plan to converge national GAAP with IFRS, thereby highlighting the great significance of the large firms' concerns regarding emergence of a "two-standard" system in the EU. The survey indicates the majority of EU countries will continue to require or allow national GAAP for individual accounts. While Belgium is considering requiring IFRS for all consolidated accounts, other EU

Advances in International Accounting
Advances in International Accounting, Volume 17, 1–29

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17001-3

countries have decided to allow or are considering allowing non-listed companies to prepare IFRS consolidated accounts.

In most EU countries, the link between financial accounting and tax accounting represents a major barrier to convergence. Other frequently cited barriers include disagreement with certain IFRS and the complicated nature of certain IFRS. International requirements for financial instruments are viewed as particularly problematic.

INTRODUCTION

According to the European Union (EU) Parliament, "A single set of accounting reporting standards is regarded as essential to ensure a high degree of transparency and comparability of financial statements and hence the efficient functioning of the EU capital market and the internal market" (European Parliament, 2002). In line with this view, listed companies domiciled in the EU will be required to prepare consolidated accounts in accordance with International Financial Reporting Standards (IFRS) no later than 2005.[1] The six largest international accounting firms applaud the EU's decision in *GAAP Convergence 2002*.

GAAP Convergence 2002 (BDO et al., 2003) provides an overview of the six largest accounting firms' most recent survey aimed at encouraging convergence of national accounting standards with IFRS. The report explores the extent to which 59 nations have developed country plans aimed at converging their national standards with the international benchmark and identifies impediments these countries have encountered, or anticipate facing, in their efforts to converge with IFRS. While *GAAP Convergence 2002* focuses on the survey findings regarding listed companies, the report also refers to the situation for non-listed companies.[2] Specifically, the firms express concern regarding the apparent emergence of a "two-standard" system in many EU member states whereby listed companies will adopt IFRS and other companies will continue to prepare financial statements based on national accounting standards. Countries that are not undertaking efforts to converge their national GAAP with IFRS are encouraged by the firms to consider the consequences. While the adoption of IFRS for listed companies is viewed as a logical transition towards convergence in the EU, the firms caution that a "two-standard" system may be difficult to maintain in the long run.

This research is based on the extensive data set collected during the large firms' survey and a review of subsequent events. *GAAP Convergence 2002* primarily focuses on the scenario for listed companies. This paper additionally presents the survey's findings regarding country plans in each of the 15 EU member states for

consolidated accounts of non-listed companies and for individual accounts.[3] An in-depth discussion of the impediments to convergence identified by the large firm survey is also presented. With few exceptions, the survey findings indicate that country plans to converge national GAAP with IFRS are limited or non-existent, thereby highlighting the great significance of the large firms' concerns regarding the emergence of a "two-standard" system in the EU. In most EU countries, the main barrier to convergence identified by the survey is the link between financial accounting standards and tax accounting. Other key barriers include disagreement with and the complicated nature of certain IFRS. International accounting requirements for financial instruments, impairment, and employee benefits (pensions) are viewed as particularly problematic in several EU member states.

GAAP CONVERGENCE 2002 BACKGROUND

GAAP Convergence 2002 represents the third major survey conducted by the six largest accounting firms aimed at encouraging convergence of national accounting standards with IFRS [*GAAP 2000*, *GAAP 2001*, and *GAAP Convergence 2002* are available on the International Forum for Accountancy Development website (www.ifad.net)]. Based on their *GAAP 2001* (Andersen et al., 2001) findings, the firms determined that, as of year-end 2001, many national accounting systems included numerous and significant differences from IFRS and that greater effort needs to be directed at identifying differences in these countries and planning for their timely removal. Therefore, the 2002 survey was designed to learn more about individual country plans to promote and achieve convergence with IFRS. A copy of the survey questionnaire is included in *GAAP Convergence 2002* (see pp. 19–23).

The 2002 survey indicates convergence towards IFRS is underway worldwide. Fifty-six of the 59 participating countries have either adopted IFRS or intend to converge their national GAAP with IFRS. Accordingly, the findings provide evidence that the International Accounting Standards Board (IASB) is viewed as the appropriate body to develop a global accounting language, thereby, supporting the legitimacy of the IASB. However, a troubling number of obstacles continue to impede convergence in many of the 59 countries. A slim majority of the surveyed countries express concerns regarding the complicated nature of certain international standards, especially those associated with fair value accounting. Slightly less than half note that the tax-driven nature of their national accounting regime impedes convergence. Approximately one-third of the countries indicate a disagreement with certain significant IFRS, insufficient guidance on first-time application of IFRS, and limited domestic capital markets pose a barrier to

convergence. About one-fifth of the countries indicate that translation difficulties and satisfaction with national standards among investors and financial statement users represent barriers to convergence. In addition to addressing the preceding obstacles, the large firms conclude that capital market participants need to join forces to ensure that: (1) the coverage of IFRS in the education and training of accountants is increased; and (2) national language translations of IFRS, including interpretations, are made available on a timely basis.

The 2002 survey questionnaire was completed by partners representing the participating accounting firms in the 59 countries. For each country, the findings reported in *GAAP Convergence 2002* reflect the consensus view of the participating partners in that country and not necessarily those of the national governments or accounting standard setters. When completing the 2002 survey questionnaire, the respondents were instructed to focus on listed companies. Thus, *GAAP Convergence 2002* categorizes countries based on the scenario for listed companies with only limited comments included in respect of non-listed companies. The survey also did not seek to address any different or additional requirements that may apply to financial services or other specialized industries.

In those countries where requirements for listed and non-listed companies differ, the responding partners were asked to provide additional information regarding the situation for non-listed companies (i.e. would they be allowed or required to prepare consolidated accounts based on IFRS, etc.). For the EU countries, the explanatory comments provide an indication of whether, in response to the European Commission's requirement that all listed companies prepare consolidated accounts based on IFRS no later than 2005, national GAAP will also converge with IFRS or alternatively that a "two-standard" system is materializing. The primary data source for this paper is the explanatory comments provided by the partners. In addition, subsequent events are reviewed.

LITERATURE REVIEW AND EU CONVERGENCE EFFORTS

Prior Literature on Harmonization and Convergence

Research focusing on the harmonization or convergence of global accounting standards has accelerated over the last two decades. Initially, this research tended to debate the "harmonization" of accounting standards in either a subjective, descriptive, or analytical manner (Meek & Saudagaran, 1990; Rivera, 1989; Samuels & Piper, 1985). More recently, research addressing "harmonization," now more frequently referred to as "convergence," has not only become much more prevalent

but also tends to be more empirical in nature (for an extensive discussion of this literature, see Emenyonu & Adhikari, 1998; Garrido et al., 2002; Larson & Kenny, 1999; Rahman et al., 2002). Two branches of research assess the International Accounting Standard Committee's (IASC's) (predecessor of the IASB) success in facilitating or achieving harmonization. These either: (1) analyze the accounting practices of corporations, *de facto*; or (2) analyze national accounting standards, *de jure* (Nobes & Parker, 1998; Tay & Parker, 1990). Two lines of relevant research are reviewed here.

Several prior studies examined corporate financial statements to determine whether corporations are complying with the measurement and/or disclosure requirements of international accounting standards (i.e. *de facto* harmonization) (Meek & Saudagaran, 1990). While most professional accountancy bodies that represent the IASC member states have on occasion indicated that the individual corporations domiciled in their respective countries actually comply with International Accounting Standards (IASs) (IASC, 1988), several independent studies provide evidence to the contrary. Street et al. (1999), Street and Gray (2002), and Cairns (1999, 2001) examine the financial statements of major companies from around the world that claim to comply with IASs. These authors report significant noncompliance with IASs. This problem of non-compliance (often referred to as "IAS lite") is further illustrated by Glaum and Street's (2003) recent analysis of companies listed on Germany's Neuer Market that claim to be applying either IAS or U.S. GAAP.

One line of research explores the conditions under which compliance and disclosure levels are increased. Zarzeski (1996) finds that disclosures provided by corporations operating in the global culture exceed those mandated by their country of domicile. In addition to providing evidence that compliance with IASs is significantly greater for companies with U.S. listings or filings, Street and Bryant (2000) find that companies making reference to the use of IASs have overall significantly higher levels of disclosure when their stock is listed in the U.S. Using non-U.S. firms listed on the London Stock Exchange, Ashbaugh (2001) finds that non-U.S. firms are more likely to disclose IAS or U.S.-GAAP financial information as their shares trade in more equity markets. While disclosure and compliance levels are important and closely related to mandated accounting regulations and laws, these prior studies more closely build upon *de jure* research.

Studies regarding the harmonization or convergence of accounting regulations and laws (*de jure* harmonization) follow two dominant strains: (1) the study of stock exchange regulations; and (2) the study of national accounting standards. The former body of research is rather sparse. Tondkar et al. (1990), Cooke and Wallace (1990), Adhikari and Tondkar (1992), and Rahman et al. (1996) explore different aspects of measuring regulation harmony and the factors influencing

regulation. Rahman et al. (2002) empirically supports the notion that regulatory harmony can improve practice harmony. The latter study highlights the significance of the EU's decision to require listed companies to prepare consolidated accounts based on IFRS.

The second strain of research examines official accounting standards and harmonization. Early studies examined the progress being made toward achieving harmonization between IASs and official national accounting standards (for a review of this work, see Larson & Kenny, 1999). These studies produced varying conclusions regarding progress toward harmonization. Due to the increased legitimacy of the IASC, and now IASB, more contemporary studies usually indicate that national accounting standards are converging with international standards. Some of these studies focus on comparisons of one country's national GAAP and IASs, including the U.S. and IASs (Bloomer, 1996, 1999; Deloitte Touche Tohmatsu (DTT), 2002b; Epstein & Mirza, 2000; Ernst & Young, 2002; Street & Gray, 1999), U.K. and IASs (Cairns & Nobes, 2000), China and IASs (DTT, 2002a), and Australia and IFRS (DTT, 2003a).[4] Studies by Pricewaterhouse-Coopers (PwC) have examined harmonization between national standards in the U.S. and U.K. with IASs (PriceWaterhouse, 1997; PwC, 2001). Studies comparing national standards in multiple countries and IASs include Street (2002), Street and Shaughnessy (1998), *GAAP 2000* (Andersen et al., 2000) and *GAAP 2001* (Andersen et al., 2001). In general, this body of research indicates that, while over time national accounting standards are gradually converging with the international benchmark, a number of significant differences remain to be addressed before convergence is achieved. As the U.S., U.K., and many other countries around the world are currently working to converge their accounting standards with IFRS, additional research is needed in this area to provide up-to-date assessments of convergence.

Recent developments in the EU now allow for an examination of the interaction of stock market regulation and national accounting standard setting on convergence. EU accounting directives and regulations will require that listed companies domiciled in member countries prepare consolidated accounts based on IFRS (i.e. mandate a high level of regional convergence for listed companies' consolidated accounts). Conversely, individual countries will be allowed to determine whether this requirement will be extended to other companies (i.e. allow differences to continue in other instances). In other words, individual countries may continue to set their own accounting standards for both the consolidated and individual accounts of non-listed companies and the individual accounts of listed companies. Thus, the current study contributes to the literature by exploring the dynamics that evolve when regional regulations mandate convergence for certain types of accounts while allowing individual countries to

determine the degree to which national standards converge with IFRS, thereby allowing for the emergence of a "two-standard" system.

Convergence Efforts by the EU

In 2002, the European Parliament endorsed a proposal to require all EU listed companies to prepare consolidated accounts in accordance with IFRS, as adopted by the EU Commission, by 2005 at the latest. An exception is provided for EU listed companies that are publicly traded both in the EU and on a regulated third country market which are already applying another set of internationally accepted standards, as well as companies which only have publicly traded debt securities. These companies can delay adoption until 2007. Frits Bolkestein, EU Commissioner for the Internal Market, welcomed Parliament's decision and stated that adoption of IFRS will mean that "investors and other stakeholders will be able to compare like with like. It will help European firms to compete on equal terms when raising capital on world markets" (Bolkestein, 2002).

In July 2003, the Accounting Regulatory Committee of the European Commission (EC) voted unanimously to endorse most existing IFRS for use in the EU. Exceptions included IAS 32, IAS 39, and related Standing Interpretations Committee (SIC) interpretations 5, 16, and 17. In response to the Accounting Regulatory Commission's recommendation, the EC adopted Regulation No. 1725/2003 endorsing IFRS (with the above exceptions) in September 2003. The EC initially indicated a decision regarding IAS 32 and 39 would follow modifications made via the IASB Improvements Project. When the revised IAS 32 and 39 were issued on December 17, 2003, the standards were praised by several IASB partner standard setters and others (i.e. U.K. Accounting Standards Board, U.S. Securities Exchange Commission (SEC), and Australian Securities and Investment Commission). However, no endorsement was immediately forthcoming from the European Parliament, which has the right to reject individual IASB standards.

The EU regulation permits individual member states to decide whether or not IFRS standards endorsed by the EC will be required beyond the preparation of consolidated accounts by listed companies. Thus, the fate of non-listed companies is being debated in each country as to whether they will be required or allowed to prepare IFRS based consolidated accounts. Another important issue under consideration is to what extent, if any, IFRS will impact individual (as opposed to consolidated) accounts. Historically, most continental European countries linked their financial reporting and tax laws (Eberhartinger, 1999; Hoogendoorn, 1996; Lamb et al., 1998; Nobes & Parker, 1998; OECD, 1987).[5] Indeed Guenther and Hussein (1995) conclude that "One of the biggest impediments to uniform

international accounting standards is the requirement in many countries that financial reporting standards conform to tax regulations" (p. 132). Our review of the large firms' survey findings provides a preliminary indication of the extent to which EU countries have been motivated by the EU 2005 decision to break or relax this traditional link.

Our analysis indicates that in most EU countries only listed companies will be required to prepare consolidated accounts in accordance with IFRS and that both listed and non-listed companies will continue to prepare individual statements in accordance with national GAAP. The survey findings further confirm that the latter is largely due to the traditional link in continental Europe between taxes and individual financial statements. In several countries, non-listed companies will either be required or allowed to prepare consolidated accounts based on IFRS, with the latter being more common. Only a very small number of EU countries are contemplating a break from tradition by requiring or allowing preparation of individual accounts based on IFRS.

FINDINGS

Convergence Efforts by Individual EU Countries

For each EU country surveyed in *GAAP Convergence 2002*, this section includes a discussion of 1) country plans to converge national GAAP with IFRS and 2) the difficulties experienced or anticipated by each country in working toward convergence. A summarization of the findings is provided in Table 1 regarding plans for both consolidated and individual accounts. Table 2 summarizes the major perceived impediments to convergence in each EU country. The issue of timely access to national language translations is discussed in the next section.

Austria

In Austria, only listed companies will be required to prepare consolidated financial statements in accordance with IFRS. However, section 245 of the Austrian Commercial Code (issued January 1, 1998) will continue to allow non-listed companies to prepare IFRS consolidated accounts. The transition to IFRS for listed companies should be fairly smooth as the Vienna Stock Exchange has required companies listed on the A-Market and Growth Market to prepare consolidated accounts based on IFRS or U.S. GAAP since April 2001. There are no plans to modify requirements for individual accounts.

Table 1. Use of IFRS in EU Countries by Listed and Non-Listed Companies, and by Companies for their Consolidated and Individual Financial Statements.

EU Member Country	IFRS Will Be Required For			
	Consolidated Financial Statements of Listed Companies	Individual Account Financial Statements of Listed Companies	Consolidated Financial Statements of Non-Listed Companies	Individual Account Financial Statements of Non-Listed Companies
Austria	Yes	No	Allowed option	No
Belgium	Yes	No	Being considered as required	No
Denmark	Yes	Being considered as required 2009	Being considered as allowed	Being considered as allowed
Finland	Yes	Being considered as allowed	Being considered as allowed	Being considered as allowed
France	Yes	No	Being considered as allowed	No
Germany	Yes	No	Allowed option	No
Greece	Yes	Yes	Allowed option	Being considered as allowed
Ireland	Yes	Being considered	Being considered	Being considered
Italy	Yes	Yes	Allowed	Allowed
Luxembourg	Yes	Being considered	Being considered as allowed	Being considered
The Netherlands	Yes	Being considered[a]	Allowed option	Being considered[a]
Portugal	Yes	Yes	Allowed	Allowed option
Spain	Yes	No	Allowed	No
Sweden	Yes	Being considered	Being considered	Being considered
United Kingdom	Yes	Allowed option	Allowed option	Allowed option
Total	15 Yes			

[a] Companies may apply IFRS as long as they do not conflict with national law.

According to the survey, the tax driven nature of Austrian standards serves as a primary impediment to converging national GAAP with IFRS. As income taxes are directly derived from results presented in individual financial statements, further reluctance can be anticipated from tax authorities in regards to convergence for individual accounts.

The survey also notes that limited local capital markets and disagreement with certain significant IFRS represent barriers to convergence. Unlike IFRS, Austrian GAAP is generally driven by the concept of "prudence" and the principle of lender/creditor protection. Accordingly, differences between Austrian GAAP and IFRS remain significant with differences associated with fair value accounting

Table 2. Perceived Impediments to Achieving IFRS Convergence in Large Firm Survey.[a]

EU Member Country	Complicated Nature of Particular Standards	Tax-Driven Nature of the National Accounting Regime	Disagreement With Certain Significant IFRS	Insufficient Guidance on First-Time Application of IFRS	Limited Capital Markets	Satisfaction with National Accounting Standards Among Investors/Users	Language Translation Difficulties
Austria		X	X		X		
Belgium		X					X
Denmark			X	X			
Finland	X	X	X		X	X	X
France	X	X	X				
Germany	X	X	X				
Greece		X					
Ireland	X		X				
Italy		X	X	X			
Luxembourg	X	X				X	
Netherlands			X			X	
Portugal	X	X		X			
Spain	X	X	X				X
Sweden		X					X
U.K.	X		X				
Total	8	11	10	3	2	3	4

[a] As of December 31, 2002.

being particularly evident. For example, fair value adjustments, such as unrealized gains, are not presented in Austrian GAAP financial statements.

Belgium

In Belgium, IFRS will initially only be required for the consolidated accounts of listed companies. However, wider use of IFRS is being actively debated, and it is possible that all companies will eventually be required to prepare IFRS based consolidated accounts. In April 2001, the Accounting Standards Commission, Belgium's accounting standard setter, published *IAS: Guidelines for a Belgium Policy*. At that time, the Commission expressed a preference that both listed and non-listed companies be allowed to prepare consolidated accounts based on IFRS, and that the use of IFRS in individual statements be prohibited. Currently, companies with an international background may obtain authorization from the Banking and Finance Commission (listed companies) or the Minister of Economy (non-listed companies) to prepare consolidated accounts under IFRS. Companies operating in industries where U.S. GAAP is widely recognized or that are listed in the U.S. may alternatively apply for permission to prepare U.S. GAAP consolidated accounts provided the rules adopted do not conflict with EU Accounting Directives.

While more companies are expected to voluntarily adopt IFRS, the Commission stressed the importance of removing from Belgium GAAP all "unnecessary differences" with IFRS. Accordingly, the Technical Committee for European and International Accounting Harmonization was created to identify issues that need to be addressed to achieve convergence.

While Accounting Standards Commission recommendations refer more frequently to IFRS and are more and more inspired by IFRS, as of year-end 2002, significant differences remain between IFRS and national GAAP. *IAS: Guidelines for a Belgium Policy* notes the priority of several issues that need to be addressed in the interest of convergence. These include: pension accounting, revenue recognition, deferred taxes, intangible assets, changes in accounting policies, the cash flow statement, leases, fair value measurement, accounting for associates, interim reporting, extraordinary items, general provisions, capital grants, and construction contracts. Interestingly, disagreement with certain IFRS was not noted by the partners as an obstacle to achieving convergence. Conversely, the respondents indicated some Belgian companies are concerned about certain IFRS required disclosures. Segment reporting was noted as an example.

GAAP Convergence 2002 found that a major obstacle to convergence is the tax-driven nature of the Belgium accounting regime. As statutory accounts serve as

the basis for corporate income tax returns, the current view in Belgium as noted above is that the use of IFRS in individual financial statements should continue to be prohibited.

Subsequent to the survey, the Accounting Standards Commission in 2003 proposed that all Belgium entities adopt IFRS for consolidated accounts effective 2007. In the interim, the intention is to modify policy in regard to using non-Belgium GAAP, thereby, making if easier for both listed companies (prior to 2005) and non-listed companies (prior to 2007) to obtain permission to use IFRS. If the Commission's proposal is approved, no Belgian company will be granted permission to use U.S. GAAP (DTT, 2003b).

Denmark

Since 2002, the Copenhagen Stock Exchange has encouraged listed companies to prepare consolidated accounts based on IFRS prior to the 2005 deadline. Subsequent to the firms' survey, the Danish Parliament proposed a law, during the Fall of 2003, to require the use of IFRS in individual statements if IFRS is utilized in the preparation of consolidated statements (DTT, 2003c). The proposed law would also permit non-listed companies to use IFRS, rather than Danish GAAP.

The large firms recommend that reviewing Denmark's approach to convergence may assist other countries in developing effective convergence plans. Specifically, Denmark has worked in recent years to remove differences with IFRS on a gradual basis, thereby, giving companies sufficient lead-time to prepare for full IFRS adoption.

Historically, Denmark pursued a strategy of harmonizing national and international requirements on a standard-by-standard basis. A new accounting law, effective in January 2002, modified this approach by creating the Danish Accounting Standards Board, which has authority to issue mandatory standards for listed and non-listed companies. The Board unanimously agreed that Danish Standards (DK-AS) should be based on IFRS and began revising national standards. At year-end 2002, the 17 existing DK-AS, which are mandatory for listed companies, were very close to the corresponding IFRS. While the Danish accounting law is applicable to all companies (listed and non-listed), it applies a building block approach with increasing mandatory requirements as companies increase in size and complexity. While Denmark's convergence efforts are impressive, additional work remains. Priorities include development of national standards where no DK-AS exists and an evaluation of how the IASB's Improvements Project should impact newly revised DK-AS.

According to the survey, the difficulties faced or anticipated in working toward convergence are insufficient guidance on first-time application of IFRS and a disagreement with certain IFRS. The Association of State Authorized Public Accountants in Denmark believes IFRS 1, regarding the first-time application of IFRS, is unclear. The Association argues that because the Danish accounting environment is characterized by a long-standing tradition of retrospective application of changes in accounting principles, Danish companies that have already switched to IFRS provide evidence that making the change retrospectively is possible. In the area of disagreements with certain IFRS, the Association noted in a letter to the IASB regarding the Improvements Project that IAS 39 (Financial Instruments) is very complex and that its application consumes considerable resources. The survey additionally notes concern in Denmark regarding the complexity of IAS 19 (Employee Benefits).

Finland

Finland plans to only require IFRS for consolidated statements of listed companies. However, voluntary adoption of IFRS for consolidated accounts of non-listed companies may become an option. No plans currently exist to converge Finnish GAAP with IFRS.

GAAP Convergence 2002 reports that obstacles to convergence include the tax driven nature of Finnish GAAP, general satisfaction with Finnish GAAP by investors and users, limited local capital markets, and the complicated nature of and significant disagreement with certain IFRS. Regarding the latter, problematic standards include those associated with financial instruments, leases, impairments, and business combinations. The survey also reveals that the reluctance of national authorities to accept standards based on rules prepared by an international organization and the "Anglo-Saxon" view of IFRS represent further barriers to convergence.

France

In France, IFRS will only be required for consolidated statements of listed companies. Non-listed companies will likely be allowed, but not required, to prepare consolidated accounts according to IFRS. There is no convergence plan for individual statements.

While the official position of the French standard setter is to incorporate IFRS into French GAAP "to the extent possible," convergence is often limited by the link between taxation and accounting in individual accounts as well as the complicated

nature of and disagreement with certain IFRS. International standards subject to great criticism include IAS 39 (Financial Instruments) and IAS 36 (Impairment of Assets). IAS 19 (Employee Benefits), IAS 36, and IAS 37 (Provisions) are under review; however, full convergence with IAS 36 in both individual and consolidated accounts has been delayed as the French authorities will not authorize the IAS 36 approach for individual accounts. Furthermore, the French standard setter is delaying completion of other projects until the IASB finalizes its work program in areas such as intangible assets, depreciation, and amortization of goodwill. Another barrier to convergence stems from the French authorities' view that IFRS may not be appropriate for Small and Medium Size Enterprises (SMEs).

Germany

IFRS will only be required for consolidated financial statements of German listed companies. Subsequent to the survey, the German Ministries of Justice and Finance announced that non-listed companies will be permitted, but not required, starting in 2005, to prepare consolidated accounts based on IFRS (DTT, 2003c). All individual accounts will follow German GAAP, although individual accounts prepared according to IFRS may also be presented.

Since the late 1990s, Germany has achieved selective adjustment of its consolidated accounting rules. In 1999, a law was passed to improve transparency for listed companies. As a result, the German Accounting Standards Board (GASB) was formed and initially assigned the task of developing and recommending interpretations of the law for the preparation of consolidated statements. These recommendations, which are applicable for all companies preparing consolidated accounts, follow IFRS to the extent possible but do not supercede German GAAP. In recent years, the GASB has introduced several interpretations in line with IFRS and made several proposals to the legislature to converge the German Commercial Code with IFRS.

The survey identified several difficulties in moving to IFRS, including the tax driven nature of German accounting requirements and disagreements with and concerns about the complicated nature of certain IFRS. Standards based on fair value measurement, such as IAS 39 (Financial Instruments) and IAS 40 (Investment Property), are viewed as particularly complicated as "it is impossible to interpret German GAAP in a way that it will converge to IFRS." There is also considerable disagreement with IAS 39's prerequisites for the application of hedge accounting.

Other barriers to convergence were revealed by the survey. German GAAP financials form the basis for certain legal parameters that, for example, limit the amount of distributable profit. Also, due to the "principle" driven accounting law, some applicants have problems with the "rules" oriented model of IFRS. Finally,

the completely different approach of German GAAP and IFRS (creditor protection vs. providing information to affect economic decisions of a wide range of users) poses an impediment to convergence.

Subsequent to the survey, the GASB revised its objectives and work program to make cooperation with the IASB and other major national standard setters its primary objective. The GASB is one of seven national standard setters holding a liaison seat on the IASB.

Greece

All consolidated financial statements of companies listed on the Athens Exchange, dated after December 31, 2002, are to be prepared in accordance with IFRS. Law 2992 of the Greek Ministry of Finance and National Economy, which was issued March 20, 2002, further indicates that non-listed companies may voluntarily chose to prepare consolidated accounts based on IFRS.

A key difficulty experienced in working toward convergence is the tax driven nature of the Greek accounting system. The survey further indicates that a lack of IFRS knowledge and experience impedes convergence. Only IAS 39 (Financial Instruments) is noted as being particularly complicated.

Ireland

A separate questionnaire was not sent to partners based in Ireland. This was deemed appropriate because one body currently sets accounting standards for both the U.K. and Ireland.

Subsequent to the survey, the Institute of Chartered Accountants in Ireland requested that the government decide quickly whether the requirement of 2005 will be extended to non-listed companies. The Institute recommended that IFRS be applied to all Irish companies with a three-year transition period being allowed to facilitate the change. While awaiting a decision, Irish companies will continue to prepare accounts based on standards issued by the U.K. Accounting Standards Board (ASB).

Italy

In Italy, IFRS will be required for the consolidated and individual accounts of listed companies and allowed for all accounts of non-listed companies.

The Organismo Italiano di Contabilita (OIC) represents the Italian accounting profession and includes accountants, auditors, and entrepreneurs all representing

their various associations as well as state/government entities, and universities. An objective of the newly formed OCI is to represent the accountancy profession and promote implementation of IFRS in Italy.

The survey reveals that difficulties encountered in working toward convergence in Italy include insufficient guidance on the first-time application of IFRS, the tax driven nature of the Italian accounting system, and disagreement with certain significant IFRS. Regarding the latter, areas of concern include: the fair value model, the present value of certain long-term accruals, certain accruals based on prudence, adjustments to purchase price in business combinations, reverse acquisitions, segment data, earnings per share, impairment losses, financial instruments, and employee benefits.

Further impediments to convergence stem from current Italian law that prescribes accounting principles based on the cost model and on rules that differ from IFRS. The survey also suggests application of IFRS could have disastrous fiscal consequences (i.e. revaluations) and cost disallowances on unconsolidated financial statements.

Luxembourg

IFRS will only be required for consolidated statements of listed companies in Luxembourg. A proposed law would further allow companies receiving approval from the Accounting Standard Commission (a group established to advise the Ministry of Justice on accounting issues) to apply IFRS instead of Luxembourg GAAP. However, expectations are that only a small number of large companies will apply for permission to use IFRS. Application of the proposed new law is set for 2004 to allow sufficient time for the government to understand and adopt the EU's proposed changes. The survey suggests there is no intention to remove existing differences between Luxembourg standards and IFRS.

Several obstacles pose a barrier to convergence in Luxembourg, including the tax-driven nature of the national accounting regime. Currently, commercial and tax balance sheets are linked for purposes of calculating tax liabilities. Moreover, the general view is that all companies will likely suffer if adoption of IFRS translates into a higher corporate tax base or a need for dual reporting under IFRS and current tax standards.

The survey further notes that, while major companies and subsidiaries of groups from the EU will likely welcome a move towards IFRS, local SMEs are satisfied with current national standards. In general, the complicated nature of certain IFRS represents a barrier to convergence as some IFRS are too complicated for SMEs to understand and apply.

Application of IFRS in Luxembourg is suggested only for consolidated accounts as legal obstacles, practical issues, and inconsistencies with current practices are too great for individual accounts. In addition to taxes, legal issues representing barriers to convergence include the calculation basis for dividend distributions and the transfer to the legal reserve and provision policies.

The Netherlands

In the Netherlands, IFRS will be mandatory for listed companies' consolidated accounts. Currently, all companies for national reporting purposes may voluntarily adopt IFRS, provided they are not in conflict with company law. So far very few companies have chosen this route.

A longstanding policy of the national accounting standard setter is to incorporate IFRS into Dutch Guidelines for Annual Reporting to the extent they are judged to be acceptable and not in conflict with the law. This position is supported by governmental representatives and is referred to in several official documents. To date, revisions aimed at bringing national GAAP in line with IFRS have included limited deviations that take the form of inserting additional options or deleting IFRS options. Gray letter paragraphs have at times been deleted when not deemed necessary. Typically, one or two significant deviations with the corresponding IFRS remain per standard as well as numerous textual differences.

All existing international standards, except for IAS 19 (Employee Benefits), IAS 39 (Financial Instruments), and IAS 41 (Agriculture) are incorporated into Dutch GAAP. As of year-end 2002, IAS 19 and IAS 39 had been published as draft guidelines, but there is no plan to incorporate IAS 41 into national GAAP. The process of incorporating IFRS into Dutch GAAP is expected to continue beyond 2005 with non-listed companies as the target group.

In the Netherlands, obstacles to convergence include a general satisfaction with national standards among investors and other users and a disagreement with certain IFRS. Regarding the latter, IAS 19 is of particular concern. The survey further explains that adjustments to IFRS have occasionally been deemed necessary to comply with legal requirements associated with the legal or economic background of Dutch institutions and transactions. Pension accounting provides a specific example.

Portugal

In Portugal, IFRS will be required for consolidated accounts of listed companies. Subsequent to the survey, in April 2003, the Portuguese standard setter (Comissao

de Normalizacao Contabilistica – CNC) decided to extend the use of IFRS to the individual accounts of listed companies, the accounts of other companies obliged to undergo a statutory audit, and the accounts of government companies obliged to have an audit (DTT, 2003b). In addition, non-listed companies may elect to prepare statements in accordance with IFRS. For companies choosing not to follow IFRS, the Portuguese standard setter is preparing a new national GAAP that will include simplifications of certain IFRS. However, some IFRS will not be considered. These include Financial Instruments (both IAS 32 and 39) and Impairment of Assets (IAS 36).

Obstacles to convergence in Portugal include insufficient guidance on first time application of IFRS, the tax driven nature of national accounting requirements, and the complicated nature of certain IFRS. The survey notes that in regards to the latter, impairment and fair value (specifically as set forth in IAS 39) considerations are particularly problematic. An additional obstacle to convergence noted in the survey is the legal basis of Portuguese GAAP.

Spain

In Spain, IFRS will be required for consolidated statements of listed companies. Additionally, the Spanish Accounting and Auditing Institute's Commission of Experts has recommended that IFRS also be the basis of preparation for consolidated accounts of non-listed companies. The Commission further recommends that individual accounts of all companies be exclusively based on Spanish accounting legislation. Therefore, the Commission indicates that national GAAP should be made more compatible with IFRS to prevent Spanish companies from having to maintain dual accounting systems.

In June 2002, the Spanish Accounting and Auditing Institute published the "Report on the Current Situation of Accounting in Spain," which sets forth conclusions and recommendations regarding measures that should comprise accounting reform in Spain. The Ministry of Finance requested the Report to obtain the opinion of users, preparers, academics, and other parties interested in the process for reforming accounting rules in response to the EU 2005 requirements. While the Report represents a starting point for reform, some final decisions may not coincide with its recommendations.

The report recommends that the Code of Commerce and the Spanish Companies Act be revised and that the General Accounting Plan be generally reformed along with other legislation governing accounting. The report further indicates that revisions should be based on bringing accounting legislation into line with IFRS. Convergence will likely entail a gradual but continuous process of reform that will

initially focus on selecting IFRS that are most compatible with Spanish tradition and guarantee the most useful information from among the available options. Completion of the reforms is targeted to coincide with EU 2005.

The report recommends that both the structure and content of the General Accounting Plan should be maintained, notwithstanding adaptation to IFRS. The General Accounting Plan should continuously be updated to incorporate changes that arise in IFRS within a reasonable timeframe. However, proposed adjustments should be duly discussed and adapted to the reality of the Spanish economy. The objective is to reduce valuation and presentation options existing under IFRS, thereby, leaving one option for each principle. Modifications will also be made to address special transactions frequently occurring in Spain that are not sufficiently addressed by IFRS. To simplify use by SMEs, some techniques included in IFRS may be reconsidered.

Obstacles to convergence include the tax driven nature of Spanish accounting requirements, and the complicated nature of and a disagreement with certain significant IFRS. Regarding the latter, areas of particular concern include deferred tax assets and liabilities, tangible fixed asset restatements, goodwill, business combinations, certain aspects of retirement benefits, financial instruments, and fair value. An additional obstacle to convergence is the view that accounting requirements for small companies should be simplified.

The survey cautions that the level of IFRS knowledge and preparation for adoption by listed companies needs to improve and that at year-end 2002 few Spanish companies had started to plan for conversion of IFRS. The main problems anticipated at the time of conversion are associated with changes in accounting policies, management training needs, and changes in financial information systems.

Sweden

In Sweden, IFRS will only be required for consolidated statements of listed companies. Wider application, especially for non-listed companies, would result in substantial conflicts with the tax laws. However, a special committee has been appointed to advise the government on how options in IFRS (other than consolidated accounts of listed companies) should be used.

Sweden has two standard setters: the Financial Accounting Standards Council (Redovisningsradet, RR) and the Accounting Standards Board (Bokforingsnamnden, BFN). The Redovisningsradet, a private sector body, sets standards that are compulsory for companies listed on the Stockholm Exchange. Since 1998, Redovisningsradet has been working on a program aimed at full convergence

with international standards for group accounting, except in those instances where international standards are in conflict with the Annual Accounts Act. As of year-end 2002, 27 of 33 international standards on Redovisningsradet's agenda had been converged into a Swedish Standard, and one exposure draft was outstanding.

Bokforingsnamnden, a government authority, sets standards for non-listed companies that, while based on Redovisningsradet standards, are generally less detailed. Bokforingsnamnden has no intention of converging to full IFRS.

A major impediment to convergence is the tax driven nature of Swedish accounting requirements. Another concern is that forthcoming changes in IFRS will widen the gap between IFRS and national GAAP for non-listed companies. However, allowing wider IFRS application would produce greater conflicts with tax laws. Thus, a change in tax laws would be needed to spur further convergence. The survey indicates that further harmonization of taxation within Europe, as well as consideration of how SMEs could apply IFRS, could prompt Bokforingsnamnden to address convergence.

The survey reveals two additional obstacles to convergence. First, Swedish law has not been modified to allow fair value accounting as required by IAS 39 (Financial Instruments). While this issue should be resolved by 2004, it continues to pose a problem for Swedish companies that would like to adopt IFRS prior to 2005. Second, it is not yet clear whether Redovisningsradet will continue to set accounting standards. Changes proposed in the Improvements Project, amendments to IAS 32 (Financial Instruments), and the IASB's present work program, make it difficult for a national standard setter with limited resources to keep pace. Thus, the amount of convergence achieved for non-listed companies may progress at a slow rate in Sweden, especially in the short-term.

U.K.

In the U.K., IFRS will only be required for consolidated statements of listed companies. However, the Department of Trade and Industry has announced that in 2005 the U.K.'s listed companies will be permitted to use IFRS in their individual accounts. Additionally, IFRS will be permitted, but not required, for non-listed companies.

Currently, the U.K. Accounting Standards Board (ASB) sets standards recognized as national GAAP in both the U.K. and Ireland. Recently issued ASB standards have been closely in line with new international standards, although not identical in those instances where the Board has a strong belief in a different approach. While ASB Exposure Drafts (EDs) have historically made amendments

to international standards to reflect differences for the U.K., the current opinion in the profession is that "word for word" adoption is the preferred approach to convergence.

The ASB, which holds a liaison seat on the IASB, intends to further converge with IFRS. ASB EDs will be issued parallel with IASB EDs (a recent example is IASB ED 2 Share-based Payment). Additionally, the ASB will work to bring U.K. GAAP in line with existing IFRS where no change in the existing IFRS is expected before 2005. However, there are some differences between IFRS and current U.K. proposals.

The survey notes two obstacles to converging U.K. GAAP and IFRS. First, there are disagreements with certain IFRS, specifically deferred taxation, retirement benefits (i.e. the corridor[6]), and recycling. The complicated nature of certain significant IFRS is also seen as an impediment to convergence. For example, adoption of IAS 39 (Financial Instruments) will be particularly difficult for many medium-sized companies.

The survey suggests difficulties may also be encountered to the extent smaller non-listed companies believe there is little to gain from adopting IFRS. This should be addressed during the discussion of voluntary application of IFRS and convergence for non-listed companies.

Language Translation Difficulties

The survey reveals that in recent years IFRS and interpretations have either not been available or were not available in a timely manner in the national language(s) of several EU member states. In the latter part of 2003, the following official (or approved) IFRS translations, that are relevant to the EU, were available according to the IASB: Danish (year translated-2002), Dutch (2002), Finnish (2003), French (2003), German (2003), and Spanish (2003) (IASB, 2003c). IASB also lists an unofficial 2001 Italian translation.[7] The survey further reveals that, as of year-end 2002, unofficial translations were available in some EU countries that may locally be considered authoritative. Examples include Greek, Portuguese, and Swedish translations. In an important development, on October 13, 2003, the EC published in the Official Journal of the EU all endorsed IFRSs and SICs in the 11 languages used in the EU (see http://europa.eu.int/eur-lex/en/archive/2003/l_26120031013en.html).

The time lag between issuance of a new standard or interpretation in English and its availability in other languages has also been a major problem in several EU countries. This time lag varies greatly. Examples provided by the survey include: two months for Greek, six months for German, one year for French and Portuguese,

18 months for Finnish, and up to three years for Spanish. The survey additionally highlights that in some countries, including France and Finland, documents issued during the IASB's due process period are not translated into the national language. An important issue will be how quickly proposed and new IASB standards and interpretations are actually translated into the eleven official languages of the EU on a regular basis.

SUMMARY AND CONCLUSION

Beginning in 2005, listed companies domiciled in the EU will be required to prepare consolidated financial statements in accordance with IFRS. However, as evidenced by the large firms' 2002 convergence survey and a review of recent events, the majority of EU countries currently have no plan to extend this requirement to other companies (see Table 1). Only Belgium is currently considering requiring IFRS for all consolidated accounts (i.e. both listed and non-listed). Other EU countries have decided to allow or are considering allowing non-listed companies to prepare IFRS consolidated accounts.

In In *GAAP Convergence 2002*, the firms caution that while adoption of IFRS for listed companies represents a logical transition towards convergence, a two-standard system, whereby non-listed companies continue to use national GAAP, may be difficult to maintain in the long run. The firms encourage all countries, including those in the EU, to formalize convergence plans for non-listed companies. Specifically, the firms recommend "that all countries begin to eliminate important differences with IFRS . . . and prepare to eventually replace national GAAP with IFRS" (BDO et al., 2003, p. 8). Governments and national standard setters are encouraged to develop a formal convergence plan that incorporates target dates for eliminating differences with IFRS. As an example, the firms applaud Denmark's convergence efforts in recent years, whereby differences between national GAAP and IFRS have gradually been eliminated. According to the firms, such an approach provides companies sufficient lead-time for full adoption of IFRS. The firms' state that the "ultimate goal of each country's convergence plan should be to adopt IFRS, supplemented only in rare instances for national issues" (BDO et al., 2003, p. 8).

Unfortunately, the survey data indicates that few EU countries are aggressively working to converge national GAAP with IFRS. Only Belgium is presently considering the "adoption" of IFRS for non-listed companies, and only Denmark and the U.K. are quickly moving forward with a country plan to converge national GAAP with IFRS. While Sweden has recently devoted considerable effort to eliminate differences between the accounting standards for listed companies and

IFRS, convergence is not being pursued for the accounting standards used by Swedish non-listed companies.

The survey indicates that some countries, such as Germany and Portugal, plan to move their national GAAP toward IFRS, but significant differences with existing IFRS remain and substantive changes in national GAAP are materializing slowly. In other countries, such as Austria, Finland, and Luxembourg, the survey indicates that convergence plans are nonexistent. Per the large firms' recommendations, these EU countries need to develop convergence plans for removing differences with IFRS within the next few years. Unless convergence plans with target dates for removing existing differences are developed, the gap between national GAAP and IFRS for many EU countries will grow considerably. Given the interrelationships among accounting standards, basic conceptual differences with existing IFRS should systematically be removed to pave the way for convergence with forthcoming international standards.

Regarding individual financial statements, the survey indicates the majority of EU countries will continue to require or allow the use of national GAAP. Exceptions include Portugal and Greece, where IFRS will be required for individual accounts of listed companies, the U.K., where listed companies will be permitted to use IFRS in their individual accounts, and Denmark, where the Danish Parliament has proposed a law to require IFRS in individual statements of listed companies by 2009.

The 2002 convergence survey indicates the reluctance of most EU countries to converge national GAAP with IFRS, particularly for individual accounts, is largely due to the link between tax accounting and financial reporting in Continental Europe. Indeed, with only four exceptions (Denmark, Ireland, the Netherlands, and U.K.), all the EU countries cite the tax-driven nature of the national accounting regime as an obstacle to convergence. Hence, the survey findings are consistent with prior research that highlights the importance of the relationship between tax and financial reporting in many continental European countries and the resulting negative influence of this link on accounting harmonization (Guenther & Hussein, 1995; Lamb et al., 1998; Nobes & Parker, 1998).

The primary objective of IFRS, as set forth in the IASB Framework, is to serve the needs of the capital markets. As user needs differ from needs of the tax authorities, the large firms encourage governments to recognize the diverse purposes of financial reporting and tax accounting. In countries where the two are linked, the firms strongly recommend that governments consider approaches that will accommodate the differing objectives. Otherwise, convergence with IFRS may not be feasible, particularly for SMEs. The firms further caution that, unless a country selects a convergence plan that eventually replaces national GAAP with IFRS, companies domiciled within its borders will unlikely be able to comply with IFRS without exception.

In addition to the link between financial reporting and tax accounting, the complicated nature of certain IFRS and disagreement with certain IFRS represent frequently cited obstacles to convergence. Twelve of the 15 EU countries specifically note that international standards requiring fair value accounting, particularly IAS 39 (Financial Instruments), represent a key barrier to convergence. Highlighting the significance of this barrier, the European Commission approved all existing IFRS except those relating to financial instruments (IAS 32, IAS 39, and related SICs). Additionally, in a letter to EU Commission President Prodi, French President Chirac claims the IASB's standard on derivatives will have "nefarious consequences for financial stability" and that "several other" IASB standards "could have negative effects for businesses and the European economy" (IASB, 2003b).

While Chirac's letter was intended to pressure the IASB to give concessions to European banks that oppose derivative rules, the IASB is standing firm. IASB Chair Tweedie responded by indicating that IFRS must be based on sound financial reporting principles rather than political pressure. Introducing an August 2003 exposure draft aimed at improving and easing implementation of IAS 39, Tweedie stated:

> A standard on financial instruments is an essential element of any complete set of accounting standards. Implementing IAS 39 certainly poses challenges, but this reflects the fact that derivatives today are complex instruments . . .. In these proposals the IASB has listened to and worked closely with its constituents in making a major breakthrough in the area of macro hedging. We will be actively working with interested parties in the months ahead to ensure that we ultimately reach a well-respected, high quality solution" (IASB, 2003a).

Supporting Tweedie's position, Paul Volcker, Chair of the Trustees of the IASB Foundation, recently stated "to put the matter most pointedly . . . if . . . political authorities . . . seek to override the decisions of the competent professional standard setters – including those of the IASB . . . accounting standards will inevitably lose consistency, coherence and credibility, weakening the fabric of the international financial system" (IASB, 2003a). As noted previously, the release of IAS 32 and 39 revised in December 2003 was not followed by an EU endorsement. Accordingly, the year 2004 opened with the issue of full IFRS adoption in the EU unresolved.

In addition to standards requiring use of fair value measurements, the survey reveals several EU countries view IAS 19 (Employee Benefits/Pensions) and IAS 36 (Impairment of Assets) as being problematic. Other challenging standards noted in the survey include IAS 12 (Deferred Taxes), IAS 37 (Provisions), IAS 40 (Investment Property), and IAS 41 (Agriculture).

While the large firms encourage the IASB to make IFRS both functional and operational, they further encourage IASB to continue to base the Board's standards on sound principles. The firms state that countries should acknowledge that global

standards will not be achieved if they selectively adopt only those international standards that are consistent with their national interests or are in line with current national practice. According to the firms, the ultimate goal of all convergence plans should be to adopt all IFRS.

Although cited less frequently than the obstacles discussed above, the issue of national language translations merits attention. National language translations are a necessity for the effective implementation of IFRS. Historically, the survey finds that IFRS either has not been available, or has not been available in a timely manner, in the national language(s) of several EU member states. An important step in October 2003 was the EC's publication of all endorsed IFRS in all 11 official languages of the EU. These translations are in the EU Official Journal, which ensures that IFRS are available free of charge to all interested parties. Unfortunately, considerable concern remains regarding the significant translation time lag that may continue after issuance of forthcoming IFRS and interpretations. Even the EU admitted that the recent endorsement of most existing IFRS was delayed by about six months due to the need for high quality translations (EC, 2003). Unless this time lag issue is cut significantly, it will likely be difficult for certain EU companies to implement recently issued IASB standards and interpretations.

The effective development of IFRS and interpretations requires that interested parties, especially those that will be applying the forthcoming requirements, are able to actively participate in the IASB's due process. Currently, IASB discussion documents and exposures drafts are written in English, and there is no indication that IASB literature that is not authoritative will be translated by the EC in a timely manner. Combined with relatively short comment periods, the lack of national language IASB documents may unfortunately preclude or diminish participation by some EU countries in the development of new IFRS and may, therefore, affect the long-term legitimacy of the IASB (Larson, 1997, 2002).

In summary, the large firms' 2002 convergence survey reveals that much work remains if the EU is to achieve one set of high-quality accounting standards. Although the large firms caution that maintaining a "two-standard" system may be difficult in the long run, the survey indicates that few EU countries are either aggressively working to remove differences with IFRS or considering replacing national GAAP with IFRS. The decision to require all EU listed companies to prepare consolidated accounts by 2005 is only one step in the convergence process. According to the large firms, all countries should work toward the ultimate goal of adopting IFRS. However, our survey indicates that in the EU this will require that most countries reconsider the historical link between financial reporting and tax accounting.

The results of the survey indicate that more research is needed in the area of convergence. In particular, the roles of stock exchange listing requirements,

national GAAP requirements, and the links between financial reporting and tax accounting need further investigation.

The success of convergence also depends on many factors that are beyond the scope of this survey. Further research needs to especially focus on compliance issues. The most important issue may ultimately be whether IFRS can be enforced. In a 2001 survey, the Federation des Experts Comptables Europeens (FEE), the organization representing the accounting profession in Europe, found that about half of EU countries have no real process for enforcing accounting standards (FEE, 2001). Accordingly, FEE wants each EU member state to have "effective institutional oversight systems for accounting standards . . . to accompany self-enforcement within the reporting enterprise and high-quality external audits" (FEE, 2003). Research needs to investigate how compliance with IFRS is or will be enforced by national and EU regulatory institutions as well as by the auditing profession. For example, how effective is the Committee of European Securities Regulators? Will audits of IFRS consolidated accounts be conducted using the International Standards of Auditing (ISA) issued by the International Federation of Accountants (IFAC)? The situation in the EU clearly illustrates that deciding to adopt, or converge with IFRS, is only one part of a complex process. Successful convergence is contingent on the existence of an infrastructure that adequately addresses effective enforcement of IFRS.

The success of convergence with IFRS in the EU has broader ramifications. Robert Herz, Chairman of the U.S. Financial Accounting Standards Board (FASB), recently wrote "convergence is an imperative – we cannot avoid this effort" (Herz, 2003, p. 253). Many believe that whether the U.S. SEC allows IFRS in the U.S. for cross-border listings in great part will depend on the success of convergence in the EU.

NOTES

1. The term IFRS includes current and future standards issued by the International Accounting Standards Board (IASB) as well as International Accounting Standards (IAS) issued by the former International Accounting Standards Committee.

2. The term non-listed includes all EU domiciled companies that are not listed on an EU stock exchange.

3. The terms individual accounts or individual financial statements are used in this paper. In some countries, these financial statements may be more often known as single-entity or parent-only.

4. This list is not meant to be exhaustive, but rather representative of the large number of recent studies being produced that compare one or more countries' national GAAP with IFRS.

5. An in-depth analysis of the historical relationship between accounting and taxation in Europe is available in the European Accounting Review, 1996, Volume 5 (Supplement). Individual articles explore the relationship in Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Sweden, and the United Kingdom.
6. This conflict has been eliminated via an adjustment to IAS 19 which now incorporates the U.K. approach as an IFRS allowed alternative.
7. At the time of the survey, the most recent Italian translation was from the year 2000.

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EXPERIMENTAL JUDGMENTS ABOUT RELATED-PARTY DISCLOSURES IN CHINA

Joseph J. Schultz Jr. and Yunwei Tang

ABSTRACT

Over the past quarter century China has moved from a state-controlled economy to one that relies increasingly on market-based financing. The development of accounting principles and regulation has escalated since the trading of shares began in 1990 (Lin & Feng, 2001). Some descriptive studies portray the extent to which published financial statements comply with readily observable disclosure requirements (Xiao, 1999). However, there is little evidence about how disclosure judgments are made. Some observers indicate that experimental evidence may be most appropriate in determining how accounting standards are applied, particularly in different cultures and with different incentives (Nelson, 2003; Pownall & Schipper, 1999).

The current study gathers judgments from over 200 experienced accountants facing mixed incentives for reporting required related party disclosures. The incentives are derived from conditions distilled from China's environment to develop two realistic cases. To set expectations about disclosure judgment, theoretical arguments are provided about China's setting relative to settings in countries that have considerable history with market-based financing. Internal accountants (chief accounting officers – CAOs) and external auditors (CPAs) provide their judgments about the same cases to

Advances in International Accounting
Advances in International Accounting, Volume 17, 31–54

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17002-5

study how the incentives within their roles affect their judgments. One case portrays a CAO and one a CPA to allow for detection of how the participating practitioners perceive the different roles affecting expected disclosure behavior.

Irrespective of respondent status, results show that conflict-laden incentives are likely to result in less than full disclosure of required related party information. Practicing auditors report that the CPA auditor portrayed in the cases will more likely insist on disclosure than the CAO portrayed in the cases. This finding is driven by the participating CPAs reporting a higher probability that the CPA portrayed in the cases would insist on disclosure to a greater extent than the CAO portrayed in the cases. This finding suggests that auditors are likely to improve the quality of financial reporting in China.

INTRODUCTION

Recent occurrences in the United States (U.S.) have led to considerable discussion about the need for principles-based standards (Schipper, 2003) that may provide broader guidance than existing standards. Nelson (2003) provides a summary showing how incentives are likely to play an important role in reporting behavior with standards with differing amounts of guidance. The discussion is not dissimilar to the application of international accounting standards across different nations which are endowed with different reporting incentives arising from culture, history, accounting training, regulatory regime, and so forth. For example, some (e.g. Tay & Parker, 1990; van der Tas, 1988; Van Hulle, 1997) express concern that uniform international standards will not result in uniform reporting due to such differences. Pownall and Schipper (1999) observe that for uniformity to occur those applying the standards must have appropriate expertise and exercise independent and rigorous judgment. Given the wide-range of incentives present in different countries, we believe that it is important to study how accounting judgments are made in different countries. Our study focuses on accounting judgment in China as there is little, if any, direct experimental evidence related to how China accountants are affected by incentives there when making accounting judgments.

To establish an expectation of how China accountants' judgments about accounting disclosure may be affected, we turn to existing international accounting studies and relate China's national setting to those studies. That is, factors such as the nature of the legal system (code- or common-law), financing source (equity or other), and cultural characteristics are likely to contribute to the differences (Doupnik & Salter, 1995). Accountants in China may also be motivated more by the need to save "face" than accountants in some other societies. Within a given

society, incentives and expectations are also likely to influence the extent to which individuals are likely to disclose. For example, auditors in China may perceive a role expectation to limit information asymmetry between managers and owners more so than preparer accountants in China. Reputational concerns related to failure to report fully may also affect auditors more than preparer accountants.

Our study is limited to how conflict-laden incentives affect China accountants' judgments about required related party disclosures. It includes judgments on two different related party disclosure cases by 92 CAOs and 112 CPAs.[1] All participants respond to each of two separate cases. Both cases contain realistic, high conflict situations that condition an automatic judgment to disclose as required by the related party statement. One case involves a CAO actor; the other a CPA actor. The reason for having our participants respond to actors is to assist them in avoiding self-serving bias (explained below) and to allow them to indirectly express their perceptions of the two differentially situated accountants. Case is one of our two major independent variables as the responses provide insight about the perceived disclosure actions of preparers (CAOs) and auditors (CPAs). Our other major independent variable is the status of the respondent (CAO or CPA). Taken in combination with the actor variable, we can provide insight about how disclosure is likely to evolve depending on experiences and norms of the two participant groups. We also measure other potentially confounding variables in the debriefing portion of our instrument. The dependent variables in our study represent the likelihood that the accountant portrayed in each case will insist that each of the two required related party standard disclosures be reported. The standard requires that related party relationships and transactions be disclosed.

Our findings suggest that Chinese accountants' disclosure judgments are affected by severely conflicting conditions that are not uncommon in China. That is, the likelihood that disclosures will be made are conditioned on the costs and benefits perceived by our participants. Our findings also imply that auditors are likely to play a significant role in enhancing full disclosure in financial statements.

CHINA'S ENVIRONMENT

Table 1 reflects considerable progress through the time of our study toward establishing a set of comprehensive GAAP and qualified accounting personnel to apply and interpret those GAAP. These are the primary focuses of our study. Table 1 shows that the first comprehensive securities law was adopted in December 1998 and became effective in July 1999. Thus, it was not effective when we ended our data gathering in Spring 1999. It is noteworthy that growth in listed companies (LCs) was exceptional during the period reflected in Table 1.

Table 1. A Partial List of Major Dates in the Development of China's External Reporting.[a]

Date[b]	Description
December 1990	Trading begins at Shanghai Stock Exchange
July 1991	Trading begins at Shenzhen Stock Exchange
November 1992; July 1993	Ministry of Finance adopts generally accounting standard
1992	First CPA exam administered
October 1993; January 1994	CPA law passed
End of 1995	Major new auditing standards become effective (DeFond et al., 2000)
End of 1996	CICPA indicates number of CPAs at about 50,000
End of 1996	Additional major new auditing standards become effective (DeFond et al., 2000)
May 1997; January 1997	Related Parties Standard
March 1998; January 1998	Cash Flow Statement Standard[c]
March 1998	State-Owned Enterprises (SOEs) major reform, including imposition of free market type measures and special inspector system for important troubled SOEs
May 1998; January 1998	Events Occurring After the Balance Sheet Date Standard
Summer 1998	Shanghai Stock Exchange requires at least one independent director
June 1998; January 1999	Debt Restructuring Standard[c]
June 1998; January 1999	Revenue Standard
June 1998; January 1999	Investments Standard
June 1998; January 1999	Construction Contracts Standard
June 1998; January 1999	Changes in Accounting Policies and Accounting Estimates, and Corrections of Accounting Errors Standard
December 1998	Public accounting firms legally separate from sponsoring government agencies
End of 1998	CICPA indicates number of CPAs reached 56,000
December 1998; July 1999	China Securities Law
Spring 1999	National Training Institutes (goal: train practicing accountants in new standards)

[a] Detailed references for each China standard appears in the reference section (China Ministry of Finance, 1997, 1998a, b, c, d, e, f, g, h).

[b] Where there are two dates, the first represents the date passed; the second, the effective date.

[c] These accounting standards are applicable to all business enterprises; the other accounting standards are applicable to listed companies.

For example, in 1990 there were 13 LCs. By the end of 1998, the number had increased to 851 and registered a market capitalization value of nearly one fourth of China's GDP (Tang, 2000). By 2001, the number of LCs had grown to over 1100 with a market capitalization of nearly one half of GDP (Leggett, 2001). In part these capitalization numbers are fueled by extremely high demand for stocks relative to the supply of capital available in China.

For example, average price earnings ratios exceed 60 (Leggett, 2001). Such conditions make financial statement manipulation attractive and regulation and enforcement challenging.

Discussions at conferences in China as well as research and published news reports revolve not so much around the lack of laws governing investment markets, listed companies' managers, and information intermediaries, but about the enforcement of such laws and regulations. For example, discussion related to a presentation by Han (1998) at the International Conference on Accounting and Finance in Transitional Economies in May 1998 concluded that enforcement was the most important element missing in China's financial system. Pang, a high-level enforcement recruit to the Chinese Securities Regulatory Commission (CSRC) from Hong Kong, noted: China has rules and regulations, but more work should be done on enforcement" (Brown & Lim, 2001). Within the accounting literature, Graham (1996) and Xiang (1998) have questioned enforcement and indicated that this lack of enforcement is a serious limiting factor in China's progress. Work by DeFond et al. (2000) dealing with listed companies and their auditors supports the proposition that auditors attempting to enforce high standards results in their dismissal. This seems to persist in spite of the fact that discussions with knowledgeable people indicate that the accounting enforcement arm of the CSRC indicates some rather stringent actions taken against auditors of public companies and their firms.[2] As one would expect, a low level of enforcement is likely to lead to less, and less timely, disclosure even between countries with developed markets (Frost & Pownall, 1994; Nelson, 2003).

China has worked to improve its market integrity by hiring highly qualified regulatory personnel (Dow Jones Newswires February 11, 2001), stressing that accounting fraud will be dealt with severely (Dow Jones Newswires November 25, 2001), requiring that LCs managements, boards, and independent directors must file a timely report on why their financial statements was accompanied by a qualified or disclaimed audit opinion (Dow Jones Newswires February 6, 2002). Even though later rescinded, in 2001 it was even required that any existing LCs wishing to issue additional shares must hire internationally accredited firms to supplement their audit and that Big 5 firms must audit all financial companies (Dow Jones Newswires October 18, 2001). Even though it appears that progress is being made, achieving success appears to be nontrivial.[3]

ACCOUNTING ACROSS DIFFERENT COUNTRIES

The advent of the industrial society resulted in the need for larger amounts of capital to support greater investment for plant and equipment and to serve more

dispersed markets. Countries handled this differently in part due to existing law, culture, and institutional frameworks (Perera, 1989). For example, countries with code-based legal structures that relied on government investment financing (e.g. France) developed systems that differed substantially from countries with common-law legal structures and market-based financing (e.g. the United Kingdom – U.K.) (Radebaugh & Gray, 1997, p. 55). Doupnik and Salter (1995) tested numerous factors from nations' external environments, cultural values, and institutional structures to provide a systematic explanation of the differences among nations' accounting systems. Their evidence shows that the legal system (code- vs. common-law), the source of investment funds (market vs. non-market), and selected cultural variables explained accounting system differences.

Even if a country were to adopt standards that mimic those from countries that have long embraced accounting systems offering comprehensive bases of accounting and disclosure, it is unlikely that the reporting results would be the same. Pownall and Schipper (1999) contend that similar results will occur only if those applying the standards (including preparers and auditors) have similar expertise and exercise independent and rigorous judgment. Others attribute likely differences more to cultural differences (Tay & Parker, 1990; van der Tas, 1988; Van Hulle, 1997). Research findings are consistent with the proposition that uniform standards do not result in the same quality of reported accounting measurements across different countries (Ball et al., 2000; Schultz & Lopez, 2000). Application of accounting standards across nations is likely to be contingent on varied incentives including investment financing traditions, cultural attributes, legal systems, regulatory environments, and role of the applier. In short, it does not appear to be a simple matter to change to a sound, market-oriented reporting system if one's environment, traditional source of investment financing, and cultural values are not consistent with a more open, transparent system. To establish an expectation about how accounting judgments in China may be affected, we compare China's setting to Anglo-Saxon countries that have a long tradition of market-based financing and many other similar, seemingly relevant characteristics.

DISCLOSURE TENDENCIES: CHINA VERSUS ANGLO-SAXON COUNTRIES

Our objective in this section is to provide theoretical support for our hypotheses. Our discussion deals primarily with disclosure tendencies, but also addresses some generic matters related to financial reporting. The Anglo-Saxon group (Australia, Canada, New Zealand, the U.K., and the U.S.) has considerable

cultural, legal-system, and market-based investment financing in common (Chow et al., 1999a). Because of these similarities and a desire to deal with only two countries for expository ease, we have chosen the U.S. as a representative of this group. Using China and the U.S. as representatives of two distinct cultures is not unique as others (e.g. Chow et al., 2000) have also studied the two because of this reason, particularly in the context of knowledge sharing. Information sharing in a market-based system is of seminal importance. The U.S. can serve as a benchmark for a country with an extensive investment-market system (Radebaugh & Gray, 1997, p. 55).[4]

Culture

Gray (1988) has proposed a framework that has spawned considerable research into the differences in accounting system development across nations. Primarily a function of culture, his accounting values consist of: *professionalism (versus statutory control)*, the extent to which a nation's accounting system allows for broad range of personal judgment versus rigid, legalistic control; *uniformity (versus flexibility)*, the degree to which a system allows for handling idiosyncratic accounting events differentially; *conservatism (versus optimism)*, the extent to which a system prefers a cautious approach to measurement to cope with the uncertainty of future events vs. a more optimistic, risk-taking approach; and *secrecy (versus transparency)*, the degree to which a system allows for restriction of information to those closely involved with the entity's management and financing versus a more transparent, publicly accountable approach. The secrecy dimension is the one most directly applicable to disclosure practices (the focus of our study). The greater the orientation toward secrecy, the lower the tendency to disclose.

Gray relies on Hofstede's (1980) four cultural dimensions' model to "explain" his dimensions. These are: *power distance*, the degree to which hierarchy and unequal power distribution in institutions and organizations are accepted; *uncertainty avoidance*, the extent to which the society feels uncomfortable with ambiguity and an uncertain future; *individualism (versus collectivism)*, the degree to which society views "I" versus "we," its preference for a loose social fabric versus a tight, more interdependent fabric; and *masculinity (versus femininity)*, the degree to which a society differentiates and emphasizes gender roles and visible performance achievement – traditional masculine values – versus relationships and caring – traditional feminine values culture. We use Hofstede's model because it allows us to draw on Gray's model and make comparisons to previous studies. Considerable research supports Hofstede's taxonomy (Bochner, 1994; Chinese Cultural Connection, 1987; Sondergaard, 1994). The Chinese Cultural

Connection (1987), a study conducted from the Chinese viewpoint, is especially important for our purposes. The study used Asian literature to develop an a priori cultural model and then tested it with data from Asian and Western countries. Its results correlated highly with Hofstede's model.

Gray (1988) argues that in business relationships, secrecy or confidentiality constitutes a fundamental attitude. He posits that the higher a country ranks on uncertainty avoidance and power distance and the lower it ranks on individualism and masculinity, the more likely it is to rank high on secrecy. Uncertainty avoidance is related to the need to restrict information and to preserve security. Power distance relates to the restriction of information and the maintenance of power inequalities. Collectivism is viewed as one's attachment to the firm to the exclusion of those outside. When collectivism is high (individualism low), the orientation is to protect the firm from outsiders by maintaining secrecy. He posits only a weak relationship for masculinity. Other work supports Gray's framework, including the proposition that secrecy is negatively related to the propensity to disclose. For example, Salter and Niswander (1995) find that cultural secrecy is negatively related to financial market development and that Gray's theory is supported with regard to required disclosures. Gray and Vint (1995) find univariate support for each of the Hofstede variables in the direction proposed by Gray as they relate to secrecy and disclosures. Chow et al. (1995) findings also support the position that that little disclosure will occur that is not required where Hofstede's variables align to support secrecy. Zarzeski (1996) finds that only power distance is not related in the hypothesized directions with disclosure tendencies.

Table 2 contains a comparison of Hofstede's four cultural dimensions in China and the U.S. The most prominent difference between China and the U.S.

Table 2. Hofstede Variable Data for China and the U.S.[a]

	Power Distance	Uncertainty Avoidance	Individualism-Collectivism	Masculinity
China	58	69	17	45
U.S.	40	46	91	62
Means	51	64	51	51
Standard Deviation	20	24	25	20

Sources: Hofstede (1980), Perera (1989), Zarzeski (1996) and Chow, Shields and Wu (1999b).

[a]For each of the four cultural dimension of the Hofstede (1980) study, the country values range from 6 to 112. A higher value indicates more of that trait. China is represented by measures made in Taiwan. The Chinese Cultural Connection (1987) and later work by Hofstede (1991) and Hofstede and Bond (1988) argue for a fifth dimension, Confucian dynamism, essentially a measure of long-run orientation. We do not include this dimension as is similar to individualism-collectivism (Yeh & Lawrence, 1995).

(including other Anglo-Saxon countries) lies in the individualism-collectivism dimension. The mean for this variable reveals that China is considerably below average and the U.S. is considerably above average. Traditionally, this dimension represents the hallmark of each country. For example, scholars of Chinese culture often point out that collectivism is one of its most prominent attributes, especially as it relates to demoting one's personal interest for the preservation of group harmony (Bond et al., 1982; Chinese Cultural Connection, 1987; Hofstede, 1991; Hui & Triandis, 1985). Gray (1988) holds that societies placing a high emphasis on collectivism are concerned with those in the firm and not external parties. Harrison and McKinnon (1999) echo this relationship. By contrast, the U.S. has the highest ranking of all countries on individualism (Hofstede, 1980). Hofstede (1980) and Lane and DiStefano (1992) find that individualism runs high generally in Anglo-Saxon countries and low in Asian countries. Chow et al. (2000, p. 68) point out that individualism-collectivism dimension "has been identified as being particularly different between Anglo-American and Chinese-based cultures." Collectively, these findings support the use of the individualism-collectivism dimension as the most important cultural attribute to distinguish disclosure tendencies. All Anglo-Saxon countries have developed sophisticated market-oriented reporting systems. These conditions, coupled with the strong difference on the individualism-collectivism dimension between China and the U.S., make the U.S. a pertinent contrast for our analysis of factors affecting disclosure in China.[5]

Chow et al. (1999a) expand on the dimension of individualism-collectivism by noting that collectivist cultures often invoke a concern with maintaining "face." Face can be thought of what others think of the individual. Face can be lost "when conduct or performance falls below the minimum level considered acceptable" (Ho, 1976, p. 876). Drawing on work by Bond and Hwang (1986), Chow et al. (1999a) point out that there are two factors that distinguish face in Chinese and Western individualistic cultures. First, in the latter cultures, each person has a free choice regarding the use of language and action. In Chinese collectivist cultures this is not the case. Rather in such cultures, face attaches involuntarily as a result of belonging to, and having a certain standing in, the collective. Face is either sustained or foregone by adhering to or not the norms of behavior associated with that status. Second, Chinese collectivist cultures generally hold that maintaining or losing face has permanence, hence elevating the concern to maintain face to such a level as to evoke great caution in one's behavior. As Chow et al. (1999a) note, concern with face is likely to constrain information sharing when conflict-laden issues are present in the information-sharing scenario. Consequently, we can reasonably expect cultural characteristics in China to suppress the open sharing of information, particularly where conflict exists over whether to share or not share the information.

Investment Financing and Legal Systems

In addition to culture, Doupnik and Salter (1995) found that investment financing systems and legal systems explained the differences in how national accounting systems developed. They argue that countries relying on equity-based financing will generate more sophisticated accounting information, because stakeholders in these countries have limited access to alternative sources of information. In countries relying on bankers, governments, or families as the primary sources of financing, access to private information reduces the need and desire to develop more open and informative accounting systems. Botosan (1997) and Verrecchia (1983) show that information deprivation in a market system leads to decreased firm value, consequently there is considerable motive to develop reliable information systems. The work provides support for Doupnik and Salter's (1995) position. Radebaugh and Gray (1997, p. 55) concur. They identify France as a primary example of a non-equity-based country and the U.S. as an example of an equity-based country. France traditionally depended heavily on government financing and required reporting in a uniform governmentally determined system, reducing the need for a more informative accounting system. For the three decades ending in the late 1970s, nearly all of China's investment funding was provided by the government. Significant shifts from this model were not apparent until the establishment of the stock exchanges in the early 1990s (see Table 1). The government continues to provide considerable funding and some critics argue that the market is driven more by administrative concerns than by economic fundamentals (*Dow Jones Newswires*, January 8, 2001).

Doupnik and Salter (1995) classify legal systems as either common-law or code-based. Jaggi and Low (2000) consider a number of variables that affect disclosure tendencies across nations. Their findings support that common-law, as opposed to code-based, countries tend to have higher levels of financial disclosure. They also find that when collectivism is high in code-based cultures, disclosure deprivation is especially likely.

Although the U.S. now has many statutory laws, the primary basis for much of its law evolved through the "common law." Common law depends on a strong judicial system to set precedent where statutory law is nonexistent or vague. Reliance on common law takes the view that citizens are allowed to do whatever is not forbidden by precedent. Anglo-Saxon countries share this common-law heritage. Other countries developed quite differently. For example, Radebaugh and Gray (1997, p. 49) identify France as a primary example of countries with a tradition of code-based law. Code-based law specifies what people are not allowed to do and is indicative of a control-oriented society. As such, there is the presumption that the government collective possesses greater wisdom than the individual or

individual members of the judiciary. There is a need for instructing the people. The code-based system seems more consistent with the extensive laws in China and the relative sparseness of attorneys and the lack of judicial influence.

Taken together, the differences between China and the U.S. (as a representative of the Anglo-Saxon group) in cultural values, traditional investment-funding sources, and legal systems lead us to our first hypothesis stated in the alternative form:

H1a. Chinese accountants will not insist on disclosure of the related party relationships and transactions at a very high level (the highest possible value on our scale).

CAO's Versus CPA's

Both CAOs and CPAs face complex reporting responsibilities accompanied by conflicting incentives. As managers' employees, CAOs have motivations similar to the managers for whom they work. Managers of listed companies have incentives to report in a fair, transparent way to reduce the amount they pay for investment funds and to enhance the value of their firm (Botosan, 1997; Verrecchia, 1983). Where an active secondary market exists for managerial talent, it is important for managers to sustain a creditable reputation.

Managers also have incentives to report less than forthrightly. To achieve earnings forecasts or to make it appear that they are in control of other factors influencing their firms, they may smooth earnings by exercising their discretion where accounting standards allow for a range of values (Healy & Wahlen, 1999). Ball et al. (2000) argue that preparers faced with reporting bad news are likely to generate lower transparency when incentives for fair reporting are lacking. Auditing researchers (e.g. Loebbecke et al., 1989) contend that managers tend to commit serious misstatements when motivations are forceful. Examples include the need to overstate net assets to avoid bankruptcy or to inflate the value of the firm's stock they own.

These factors, along with others, may also influence Chinese managers who prepare financial statements for public reports. As indicated in Table 1, trading of securities was less than 10 years old at the time we gathered data. Thus, managers and accountants may not be fully aware of positive reputational effects due to enhanced reporting quality. Or, the impact of reputational effects may not hold due to different circumstances in China. DeFond et al. (2000) present evidence supporting the notion that auditor change is not so important to market valuation; consequently, managers may not feel constrained by the risk of less than full disclosure. Chen et al. (2000), on the other hand, show that investors may have just

been learning about audit reports; that is, the adverse market effect of modified audit opinions was not registered until the second year of the opinion. Cultural tendencies, legal systems, traditional financing methods, and the environment are not likely to contribute favorably to disclosure. The motivation to build managerial reputation has also suffered from the lack of a secondary market for managers (Han, 1998). Thus, CAOs unwilling to go along with less than full disclosure by high-ranking managers may have few options outside their existing enterprise. Listed companies are also subject to pressure to show a profit as regulations require they show a profit at least one in three years to retain their listing status. These arguments favor the position that managers and CAOs of listed companies in China have considerable incentives to "manage" the financial statements.

CPAs should be affected by their primary role. That is, the essence of their role is to reduce the risk associated with the information asymmetry between managers and investors, thus reducing investment cost (Arens & Loebbecke, 1997). Auditors have traditionally held themselves out to be competent and independent to fulfill this role and to establish their "value" (Simunic, 1980). In short, the auditor's reason for existence is to act as an objective information intermediary. Research conducted in the U.S., however, indicates that there are a number of incentives that are likely to affect how well auditors carry out their role. Auditors interpret ambiguous accounting standards more liberally when the risk of losing the client is greater and when the audit firm performs non-audit services for the client (Farmer et al., 1987). Hackenbrack and Nelson (1996) support similar outcomes. Trompeter (1994) finds that CPA firm compensation structure also affects auditor resolution of ambiguous accounting situations.

China has adopted rigorous auditing standards that strongly emphasize the auditor's duty to detect and disclose material financial statement misstatements or omissions (DeFond et al., 2000). As noted, the CSRC provides substantive enforcement to motivate proper application of these standards. Appropriately rigorous enforcement and litigation regimes provide incentives for CPAs to exercise more effort and achieve higher quality (Dopuch & King, 1992; Wallin, 1990). The threat of investor litigation, a realistic possibility under the 1999 Securities Law, is positively related to the conservatism adopted by CPAs when accounting standards allow a range of acceptable amounts (Farmer et al., 1987).

Chinese culture adds to the likely differences in CAO and CPA motivations. Overall, one can expect both types of accountants to strive to achieve harmony with high-level management. Not only does the Confucian Dynamism cultural attribute (Chinese Cultural Connection, 1987) support this view, but also studies conducted in Western contexts (de Ruyter & Wetzel, 1999; Schultz & Hooks, 1998) reinforce the need for affinity between managers and auditors for sharing information and nurturing to achieve an on-going relationship. However, findings

and theoretical arguments by Chow et al. (2000) condition the extent of information sharing. In particular, they argue that membership in an ingroup has consequence in terms of whether information will be shared or not, especially information that may adversely affect the ingroup or one of its members. When comparing U.S. and Chinese managers, they find that Chinese "nationals are . . . significantly less inclined than their U.S. counterparts to share information files with other employees who are not consider to be part of their 'ingroup' " (Chow et al., 2000, p. 67). They conclude that the effect of national cultural values is not monotonic, but that these values interact with attributes of the knowledge and one's employment status. Their theoretical argument is as follows:

> Members of collectivist cultures tend to form ingroups based on friendships, with each person having only a few ingroups that are stable over time (Triandis et al., 1988, p. 324). Once a close relationship is formed, collectivists tend to keep the relationship and often value it over their personal need (Triandis, 1989). While "relationships tend to be very supportive and intimate within the (in) group . . . there is little trust and often hostility toward outgroups members" (Chow et al., 2000, p. 67; Triandis, 1989, p. 516).

Our cases present a situation where a high level manager does not want disclosure. The CAO likely views himself or herself as a member of the managerial in-group. It is unlikely that he or she will disclose to the same extent as a CPA. That is, CPAs are more likely to identify with their own firms.

Consideration of these forces leads to our second hypothesis stated in the alternative form.

> **H2a.** Compared to CAOs, CPAs will report a greater insistence on disclosure of related party relationships and transactions in our case scenarios.

Role Manipulation (CAO Actor Versus CPA Actor) Between Cases

We used our two cases to manipulate the roles of CAO and CPA actors. This manipulation enabled us to determine how CAO and CPA participants viewed one another's roles in the reporting process. Using third party actors to learn about potentially controversial judgments comes from the ethics research literature (Rest, 1986). If asked directly about their own behavior, people faced with controversial judgments often ascribe more socially, ethically acceptable behavior to themselves than to other anonymous actors similarly situated. Suppose that an independent auditor was asked if he or she would insist on disclosure of a controversial issue vs. the probability of an anonymous auditor insisting on the same disclosure. It is likely that the auditor would assign a higher likelihood to his or her own disclosure tendency than to that of the anonymous auditor. Using the anonymous third party

approach has proved useful in gaining insights about sensitive reporting matters in other accounting contexts (Arnold & Ponemon, 1991; Schultz et al., 1994). We used the approach because our cases deal with substantial controversy over making the disclosure and to gain more reliable insight into our participants' actual beliefs. One case features a CAO actor; the other a CPA (independent auditor) actor. Having CAO and CPA participants allows us to test the perspectives that members of each group have about themselves and members of the other accountant-group portrayed in the cases. Since CAO and CPA participants completed both cases, the potential for bias in either group was balanced.

We used related party situations in our cases for several reasons. The related party standard was the only specific standard in force at the end of 1997 so it was the only one with which our participants could have had experience in Summer 1998.[6] Related party disclosures report only the nature and amount of the transactions; they do not serve as a basis for correcting amounts contained in the body of the financial statements. Thus, the disclosure provides a signal of the strict propriety that management observes in terms of objectivity. Disclosure of relationships that color management's strict propriety may cast doubt on the fidelity with which they carry out their responsibilities. As discussed above, this relates to the concept of face that is especially important in Asian cultures, including China.

In constructing the cases we were careful to include elements that would evoke this concept while simultaneously reflecting China's environment.[7] One case portrays a CAO actor in an entity with a clean opinion for five years, a general manager who does not want to disclose the transactions, fairly priced related party transactions, saving face, daughter involvement, etc. We label this case the CAO-actor case. The other case portrays a CPA auditor dealing with an entity which has had a clean audit opinion for the last two years, good financial condition, a controller that does not want to disclose, a related party who is the general manager of a state-owned enterprise facing added competition, etc. We label this the CPA-actor case. In spite of these conflict-laden conditions, we believe that each case meets the conditions for required disclosure under the first specific accounting standard. These conditions, however, allow participants the ability to "justify" their positions of less than absolute insistence on disclosure.[8]

Before administering our questionnaire, the cases were reviewed for reality and other characteristics by several very high-ranking, experienced partners in Chinese CPA firms. A doctoral student proficient in both English and Mandarin then translated the cases to Mandarin. He also reviewed the case situations to satisfy that they represented mandatory disclosures. The co-author from China who is proficient in both languages reviewed the translation as well as other aspects of the case. Each case asked for the likelihood that the actor would insist on disclosure of the related party relationships and transactions.

As discussed above, we believe that CPA participants will generally opt for greater insistence on disclosure than CAO participants. We also believe that CAO and CPA participants will indicate different propensities for the CAO and CPA actors to insist on disclosure. Specifically, we expect an interaction effect between the participants and the roles portrayed in the cases. The CPA participants are expected to see the CPA actor as having to take more responsibility for insisting on disclosure than the other combinations of participants and actors. Much of the discussion in the previous section supports this position and is not repeated.

With the above considerations in mind, we formulate our third hypothesis in the alternative form as follows.

H3a. CPAs will report a greater insistence of the CPA actor to disclose the related party relationship and transaction than any other combination of participant and case actor.

PROCEDURE

All participation was voluntary and all responses anonymous. A doctoral student with no relationship with any of the participants administered questionnaires to the CAOs who were attending a continuing education course. There were three administrations. A designated CPA firm member distributed the instrument to his or her firm's participants. Participants completed the instruments independently and returned them to the distributor's administrative assistant in a sealed envelope. The sealed envelopes were returned to the researchers. Four firms participated. No differences existed between CE administrations or between CPA firm administrations. Questionnaires included a short introduction, the two cases, and some demographic matters/opinions.[9] Ninety-two CAOs and 112 CPAs completed instruments for a total of 204 participants. Some typical characteristics (CAOs first, CPAs second) as measured by response means were: age (48 years, 30 years); highest education level (bachelor's degree for both); overall experience as an accountant (25 years, 8 years). Of the 112 external auditors, 84 had passed the CPA exam and 68 were CPAs. The sample consisted of experienced accountants.

RESULTS

To analyze our first hypothesis relating to perfect insistence on disclosure as required by the related party accounting standard, we conducted a *t*-test based on each of the four disclosure responses possible across the two cases combined. For

example, in the first case, a perfect response for the CAO actor, would have been to indicate a very high likelihood (a 5 on our 1 to 5 scale) that he would decide that the related party relationship must be disclosed. Our *t*-test was based on the difference between each participant's response and the optimal 5 on our scale. For this judgment the mean of this metric was 2.59 (5.00 − 2.41). The *t*-test for this judgment revealed a *t*-value of 32.6 with a directional probability test significant at well under $p < 0.01$. Tests for the other three related party disclosure judgments were similarly powerful. Consequently, we conclude that situations that invoke very consequential and realistic conflict, as those in our cases, are likely to result is less than full disclosure. The overall mean of the likelihood that the CAO or CPA would decide that disclosures must be made in the financial statements was 2.52. This numerical value falls between 2 (described as low on our scale) and 3 (described as medium) and well below the optimal 5 (described as very high). Thus, it appears that this is far below the behavior anticipated by guidance in the standard. This outcome differs from the findings of Xiao (1999) who reported positive disclosure compliance results when only format issues were considered.

To analyze the data for our second and third hypotheses, two similar models were run with only the dependent variable differing between the two. Both dependent variables (related party relationships and transactions) are required disclosures under the standard. One scale elicited the likelihood of the case actor (CAO or CPA) insisting on disclosure of the related party relationship. This resulted in a case-actor variable and a respondent variable (CAO or CPA). The other model was the same except for the dependent variable, the likelihood the case actor insisting on disclosure of the related party transaction. The model is a split plot design as one variable is between subjects and one is within subjects. Formally, the model can be expressed as:

$$y_{ijk} = \mu + \alpha_{ij} + \beta_i + \gamma_k + (\beta\gamma)_{ik} + e_{ijk} \tag{1}$$

where $i = 1, 2, j = 1, \ldots, n_i, k = 1, 2$; μ, β, γ, and $(\beta\gamma)$ are fixed parameters such that the mean for the *i*th group at case *k* is $\mu_{ik} = \mu + \beta_i + \gamma_k + (\beta\gamma)_{ik}$, α_{ij} is the random effect associated with the *j*th subject in group *i*; i.e. individual specific effects contributing to between subject error and e_{ijk} is random error associated with the *j*th subject in group *i* at time *k*; i.e. within subject error.

The model was run with the expectation that the CPA respondents would report a higher likelihood of the CPA actor reporting the relationship and transaction than any other combination of respondents and actors. Table 3 shows results for reporting the related party relationship.

Table 4 contains the results for disclosing the related party transaction. The models' results for hypotheses two and three are similar so we limit most of our

Table 3. Likelihood of Insisting on Reporting the Related Party Relationship by Status and Case Actor.

Status	Case Actor		
	CAO	CPA	Means
CAO	2.32	2.19	2.26
CPA	2.50	2.96	2.73
Means	2.41	2.58	2.50

Significant Effects	
Term	$p <$
Status	0.0002
Case	0.0647
Status × Case	0.0002[a]

[a] The status × case interaction significance is estimated by comparing each of the other three means in the relationship × status matrix individually with the mean for CPA-CPA Actor Case. The highest probability is reported. Individually the significance levels compared to the relevant mean were: CAO-Case 1 ($p < 0.0001$); CAO-Case 2 ($p < 0.0001$); and CPA-Case 1 ($p < 0.0002$).

Table 4. Likelihood of Insisting on Reporting the Related Party Transaction by Status and Case Actor.

Status	Case Actor		
	CAO	CPA	Means
CAO	2.39	2.37	2.38
CPA	2.33	2.97	2.65
Means	2.36	2.67	2.52

Significant Effects	
Term	$p <$
Status	0.0343
Case	0.0014
Status × Case	0.0003[a]

[a] The status × case interaction significance is estimated by comparing each of the other three means individually with the mean for CPA-Case 2-CPA Actor. The highest probability is reported. Individually the significance levels compared to the relevant mean were: CAO-Case1 ($p < 0.0003$); CAO-Case2 ($p < 0.0003$); and CPA-Case1 ($p < 0.0001$).

discussion to the results in Table 4. Hypothesis two reflected our expectation that the CPA, external auditor participants would report a greater insistence on reporting than the CAO participants who are more closely aligned with management's views. Results support this position ($p < 0.0343$). The results between the two cases followed this same pattern ($p < 0.0014$) as the case with the CPA actor registered a greater likelihood of insisting on disclosure than the case with the CAO actor. These main effects, however, are driven by the interaction between the status of our participant and the case actor. This interaction effect takes precedent in interpreting our results as it provides a richer understanding of what is portrayed by our findings. This leads to our third hypothesis.

Our third hypothesis was that CPA participants would view the CPA actor as exercising the highest likelihood of insisting on disclosure when compared to all other combinations of case actors and participants. The interaction was significant in the expected pattern ($p < 0.0003$). The four means in the interaction show that our participating CPAs believed that the CPA actor's likelihood of insisting on disclosure (2.97) was significantly greater than all the other combinations (means of 2.39, 2.33, and 2.37). Thus, the main effects for both case actor and participant status are driven by the 2.97 mean. The circumstances in the cases dictated disclosure. A mean of 2.97 does not represent perfect disclosure behavior (a mean of 3 on our scale was described as "medium"). Despite this low mean, we view the results as positive because they signal that CPAs believe they would insist on more disclosure even if there were potentially very serious consequences (e.g. losing the client). This result bodes well for the CPA external auditor role in China.

SUMMARY AND CONCLUSION

Our study dealt with Chinese accountants' judgments to insist on the disclosure of related party relationships and transactions under the first China specific accounting standard. The study integrated many issues from China's setting with theoretical arguments and citations about motivations and challenges related to full disclose. We believe that the analysis will be useful in understanding the difficulties that collectivist cultures with code-based legal systems have in achieving full-disclosure reporting systems to sustain a market-based funding system. When the analysis is considered, the need for enforcement seems paramount to reach a level of information reliability for proper share valuations. In China, where demand for shares is so high (average PEs are reported at over 60), the need for sound information is pressing. Published reports indicate that China is making steady progress toward improved enforcement.

Our study asked CPAs and CAOs to give their opinions on two cases, one involving a CAO (preparer accountant) actor, the other a CPA (external auditor) actor. Both cases were designed to involve significant conflicts about disclosing. The conflict situations were realistic to China's environment. The realism and conflict were intended to encourage involvement on the participants' parts, to detect whether less than optimal reporting behavior was likely under such pressures, and to determine differences in how CAOs and CPAs viewed their roles in reporting required disclosures. The cases and the findings may be useful to gauge disclosure judgments over time as laws, regulations, and enforcement regimes change rapidly in China.

Results showed that in cases such as ours, it is unlikely that disclosures will be ideal. This outcome differs from previous archival results showing near perfect disclosure compliance (Xiao, 1999). This study contributes in terms of showing how both broad cultural incentives as well as incentives within cultures might result in accounting standards being applied. Results also indicated that CPAs view their role as reducing the information asymmetry that exists between managers and investors. This finding, coupled with evidence showing that markets punish companies that receive modified audit opinions (Chen et al., 2000), offers a positive signal for the overall market investment system in China. With regard to accounting and auditing, Table 1 is indicative of progress. The relatively low tendencies to disclose, coupled with cultural tendencies, enforcement issue, and shifting financing sources in China and prior findings in the U.S. (e.g. Farmer et al., 1987), suggest that China's accounting standard-setters consider the amount of discretion allowed within standards. The standard-setting balance between more verifiable accounting treatment and more flexibility to describe economic events adequately is a very complex issue. It is beyond the scope of this paper (see Nelson, 2003 for a discussion). Other potential factors include continued political will and development of a strong regulatory and judicial structure.

NOTES

1. As with other judgment studies, our participants are not randomly selected, however, there is no compelling reason to believe that our participants are not reasonably representative of Chinese CAOs and CPAs. One author has extensive experience with business and accounting in China. Based on our participants' age, experience, education, and answers to various debriefing questions, he believes they are reasonably representative.

2. Discussions with knowledgeable parties also revealed that there was little effective civil law deterrent that allowed third parties to recover damages prior to the passage of the 1999 Securities Law. For example, at the time of this study discovery rights to auditors' working papers were not allowed nor were class action suits. The 1999 Securities Law does

provide for class action suits with joint and several liability for the perpetrator as well as criminal penalties (Article 202, PRC Securities Law, *China Law & Practice*, February 1999, 64). *Dow Jones Newswires* (Hoo, 2001) reports that a "top regulator" has encouraged some investors to sue auditors who allegedly lied about their audit client's financial statement data.

3. PriceWaterhouseCoopers (2001) has generated an opacity index based on ratings of countries' legal protections for business, macro-economic policies, corporate reporting, corruption, and government regulations. Of the 35 countries in the study, China ranks last.

4. It is worth noting that the U.S. differs little from other Anglo-Saxon countries in the cultural index means reported later. The countries' legal systems and market-based financing systems are also similar.

5. As noted, PriceWaterhouseCoopers (2001) has generated an opacity index. The difference between the two countries in that study emphasizes this contrast as its index ranks the U.S. first and China last out of 35 countries.

6. Not all of our participants had reviewed the standard or applied it. Tests revealed that neither of these variables had any impact on the participants judgments as a whole or by their CAO or CPA status ($p > 0.10$).

7. The complete instrument is available upon request from the first author.

8. The co-author most familiar with the participants expressed substantial concern that the China's cultural characteristics (a situation being either right or wrong) may lead the participants to select either 1 or 5. Thus, we believed that substantial, realistic conflict was also essential to generate variability in the reported judgments.

9. All demographic responses, attitudinal responses, and disclosure judgments were correlated to test for explanatory implications. Only age and total experience were significantly ($p < 0.10$) related to any case judgments. To test the effect of each of these variables, ANCOVA models using each judgment as a dependent variable and participant status and age (and then total experience) were run. In none of the models was age or total experience significant ($p > 0.10$). When participant status is considered, age and experience are insignificant.

ACKNOWLEDGMENTS

We thank Jianqiao Lu, who helped significantly in the formulation of this study as well as in the translation. We thank Yunqui Xue and Xin-Yuan Chen, at the time of this study both professors at Shanghai University of Finance and Economics, who provided substantial commentary on the instrument as it was developed. We gratefully acknowledge the financial support of Shanghai University of Finance and Economics and Arizona State University. We are appreciative of the comments at the first China Accounting and Finance Review (CAFR) Conference in Hong Kong in June 1999 on an incomplete version of this paper. Also, we are appreciative for comments on this version of the paper at the second CAFR conference in Beijing in May 2001. Comments by Marinilka Kimbro, James Chan, and Jane Zhang have been quite helpful.

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INTERNATIONAL DIFFERENCES IN RESEARCH AND DEVELOPMENT REPORTING PRACTICES: A FRENCH AND CANADIAN COMPARISON

Yuan Ding, Gary Entwistle and Hervé Stolowy

ABSTRACT

This paper compares the research and development (R&D) disclosure practices in France and Canada, as evidenced in the annual reports of 76 French and 110 Canadian listed companies. It finds that Canadian high-tech companies (hardware, software, and biotechnology) disclose significantly more information on their R&D activities than their French counterparts. It also finds a strong link between R&D intensity and R&D disclosure among Canadian high-tech companies. Canadian companies overall are also found to be more likely to use non-financial disclosure as a means to resolve any R&D information asymmetry, while French firms disclose more traditional financial and accounting information. Canadian companies are also more willing than French firms to provide information concerning their future R&D expenditures. These results are consistent with inherent cultural and capital market differences between France and Canada. In contrast, the study does not find any significant difference in R&D expenditure capitalization policies between French and Canadian firms.

Advances in International Accounting
Advances in International Accounting, Volume 17, 55–72

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17003-7

INTRODUCTION

The growth of research and development (R&D) expenditures over the last two or three decades, together with the continuous substitution of knowledge (intangible) capital for physical (tangible) capital in firms' production functions, has elevated the importance of R&D to the performance of business enterprises (Lev, 1999). A number of research studies (e.g. Lev & Sougiannis, 1996) find a direct and positive correlation between R&D expenditures and such things as economic growth, future income, and productivity improvements of firms. Lev (1999) also argues that outputs from R&D constitute the principal assets of high-tech (e.g. biotechnology) firms. He further showed that the R&D contributes substantially to the firm's productivity and to its value creation, and that the financial market integrates these contributions into the firm's stock price.

At the same time however, investors have difficulty correctly evaluating a firm's R&D activity. Two main reasons could explain this difficulty. The first is due to the complex nature of the R&D activity. Consequently, there exists greater information asymmetry surrounding a firm's investment in R&D than to its expenditures on physical capital items (Mande et al., 2000). The second concerns accounting regulation, and the limits of traditional (and existing) rules in accounting for intangible assets (Gelb, 2002; Lev, 2002).

This study seeks to explore, using a comparative international context, how companies in France and Canada communicate about their R&D activities in their annual reports, both as a means to reduce R&D information asymmetry, and to transcend the limits of existing accounting regulation. In particular, we are interested in exploring how differences in the two countries' capital markets, and their inherent cultural compositions, affect their R&D information disclosures. We also explore whether French and Canadian firms differ in their willingness to capitalize their R&D expenditures, recognizing that both countries' accounting rules enable capitalization under certain conditions.

In our study, the annual reports of 76 French and 110 Canadian listed companies are analyzed. Our results show that Canadian companies disclose significantly more information on their R&D activities than their French counterparts, especially firms in the high-tech industries. Our study also finds a significant link between R&D intensity and R&D information disclosure within Canadian high-tech companies. Moreover, Canadian companies are more likely to use non-financial disclosure as a means to compensate for any R&D information asymmetry, while their French counterparts disclose mainly financial and accounting information on R&D. Finally, Canadian companies are also more willing than French firms to provide information concerning their future R&D expenditures. All these differences are consistent with differences in cultural and capital market

characteristics between the two countries. However, we do not find any significant difference between French and Canadian firms in their decision to capitalize R&D expenditures.

CONTEXT ANALYSIS

Our research falls within the scope of environmental determinism, a theory that suggests a direct relationship between a nation's rules, regulations, and customs, and its environment. Using this theory, accounting researchers such as Belkaoui (1983), Taylor et al. (1986) and Gray (1988), have hypothesized and found international differences in reporting and disclosure, and have related these differences to the economic, political, and cultural environment of each country. Consequently, before studying R&D disclosure issues in France and Canada, it is necessary to first examine the environmental context in these two countries, in particular in the areas of R&D accounting regulation, capital market development, and culture.

R&D Accounting Regulation

In a global context, IAS 38 (IASC, 1998) provides guidance for accounting for R&D. IAS 38 defines research as "original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding," while development is the "application of research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems or services prior to the commencement of commercial production or use." All costs engaged in a research phase must be expensed immediately. In contrast, an (intangible) asset arising from development should be recognized if, and only if, an enterprise can demonstrate all of the following:

(1) the technical feasibility of completing the intangible asset such that it will be available for use or sale;
(2) its intention to complete the intangible asset and use or sell it;
(3) its ability to use or sell the intangible asset;
(4) an indication as to how the intangible asset will generate probable future economic benefits;
(5) the availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset; and
(6) an ability to measure reliably the expenditure attributable to the intangible asset during its development.

In Canada, the accounting rules for R&D are contained in the CICA Handbook Section 3450 (CICA, 1978) and essentially mirror those of IAS 38. In slight contrast, in France, according to the Consolidated Accounting Rules, the costs related to R&D projects should be expensed immediately.[1] However, companies can choose to capitalize the costs related to "applied" research and development projects, if these costs are reliably identifiable and valuable, clearly individualized, and have serious possibility of commercial profitability (Henrard et al., 2000). This research study explores whether French and Canadian firms differentially adopt the R&D capitalization option available to them as a means to reveal information to the market.

Capital Market Development

In terms of the nature and development of their respective capital markets, some important differences exist between France and Canada, differences that would be expected to be associated with varying levels of information disclosure. In comparison with Anglo-American countries, France has a relatively less developed capital market, with enterprise financing activity being traditionally closed and internally oriented. In particular, the capital needs of enterprises come mostly from family deposit and profit reinvestment (Redis, 1994). Furthermore, cross-shareholding among large firms is a common feature of the French economy, as is the concern of the French government to enact economic policies aimed at ensuring the stability of shareholders and the security of enterprises. Hence, significant pressures to reveal information to a broad, external, investor group are not felt by French firms.[2] Canada meanwhile, is much more representative of the Anglo-American market model, in which broad capital markets and stock exchanges play an important role in firms' financing activities. Within such a model, pressure from external investors contributes to the formation of a more transparent and disclosure-oriented reporting philosophy.[3]

Another important difference between France and Canada relates to the level of economic integration with the U.S. Due to its geographic and cultural proximity, and to such formal structures as the North American Free Trade Agreement (NAFTA), the Canadian economy is highly integrated with that of the U.S. Hence, one might expect to see Canadian firms acting relatively more consistently with their disclosure-oriented American counterparts, a finding seen in the Entwistle (1999) study on R&D disclosure. Further, Pinches et al. (1996) suggests that the American capital markets pay considerable attention to corporate R&D at every stage of the whole process, from project initiation through to commercialization.

Hence, similar attention, and heightened R&D disclosure pressures, might be expected in the Canadian markets.

Culture

One of the most visible cross-cultural research studies was done by Hofstede (1981, 2001). After interviewing employees of IBM in 50 countries in the world, Hofstede identified four inherent cultural or societal values: power distance, uncertainty avoidance, individualism vs. collectivism, and masculinity versus femininity.[4] Table 1 shows for France and Canada the scores and ranks on these four cultural dimensions. In comparison to Canada, French culture displays much larger power distance and stronger uncertainty avoidance. Conversely, Canadian culture ranks higher in terms of individualism and masculinity.

Based upon Hofstede's work, Gray (1988) hypothesized a number of links between the four cultural dimensions and a country's "accounting values"; two of these links are most relevant for this study. First, Gray predicted that a higher a country ranks in terms of uncertainty avoidance, and the lower it ranks in terms of individualism and masculinity, the more likely its accounting will emphasize conservatism.[5] Second, he suggested that the higher a country ranks in terms of uncertainty avoidance and power distance, and the lower it ranks in terms of individualism and masculinity, the more likely it will favor secrecy over transparency (i.e. over disclosure).

Salter and Niswander (1995) later directly tested Gray's (1988) hypotheses and found the strongest support for the predicted links between culture and extant disclosure practices in the country, and slightly less support for the hypothesized

Table 1. Cultural Dimensions in France and Canada.

Country	Power Distance[a]		Uncertainty Avoidance[b]		Individualism/ Collectivism[c]		Masculinity/ Femininity[d]	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank
France	68	15/16	86	10/15	71	10/11	43	35/36
Canada	39	39	48	41/42	80	4/5	52	24

Source: Culture's Consequences, Second Edition, Sage Publications, 2001, p. 500.
[a] Values range from 11 to 104.
[b] Values range from 8 to 112.
[c] Values range from 6 to 91.
[d] Values range from 5 to 95.

cultural link with conservatism. Hence, and given the (cultural) results shown in Table 1, French accounting practices for R&D should be both less transparent (i.e. less disclosure oriented) and more conservative than Canadian practices.

HYPOTHESES

Overall R&D Disclosure

Our first hypothesis concerns the overall level of information disclosed on R&D activities. Our prediction is:

> **H1.** Canadian firms disclose more information on their R&D activities than French firms.

Several arguments support this hypothesis. Firstly, capital markets (and stock exchanges) play a more important role in the financing activities of Canadian firms, which leads to a heavier disclosure pressure. Second, Canadian firms are more affected by the U.S. reporting environment where disclosure obligations and practices are arguably the severest in the world. Third, the cultural context in Canada privileges more transparent and full disclosure.

This hypothesis is also consistent with prior empirical research. For example, in their international study on environmental disclosures in 27 countries, Gamble et al. (1996) find that the British-American accounting model (which includes Canada) was associated with a higher percentage of companies providing environmental disclosures than companies operating under a Continental accounting model (which includes France); notably, Canada, along with the U.S. and U.K., had the highest average environmental disclosures per firm.[6]

R&D Capitalization

Lev (1999) finds that despite the obvious benefits of R&D to the firm, which generally stretch over extended periods of time, the R&D investment is immediately expensed (written off) in U.S. corporate financial reports, hence leaving no trace of R&D capital on firms' balance sheets, and causing material distortions of reported profitability. Relatedly, in their research on discretionary capitalization of R&D in Australia and Canada, Smith et al. (2001) observe that capitalized development costs are valued by the market, and that the valuation coefficient of a dollar of capitalized development exceeds that for a dollar of expensed R&D. Ceteris paribus, these findings would suggest a predisposition in both French and

Canadian firms to capitalize R&D, so as to both reduce the distortion of reported net income, and to give a more accurate presentation of firms' financial situation, both of which should be welcomed by the financial markets. Nevertheless, as noted earlier, French firms feel relatively less disclosure pressure from the capital market, and accounting practices are more conservative. Consequently, our second hypothesis is:

H2. Canadian firms capitalize their R&D expenditures more frequently than French firms.

R&D Disclosure and Intensity

Again, ceteris paribus, a firm should try to disclose as much as possible of its R&D activities in order to reduce information asymmetry and thereby decrease monitoring costs and the cost of capital (e.g. Welker, 1995). Accordingly, there should be a positive correlation between R&D disclosure and R&D intensity (i.e. the firm's spending on R&D). In earlier empirical work, both Tasker (1998) and Entwistle (1999) found that firms with higher levels of R&D spending were more likely to provide additional disclosures. Again, however, owing to both capital market and cultural differences, a lower correlation is expected between R&D disclosure and R&D intensity for French firms. Hence our third hypothesis is:

H3. There is a stronger link between R&D disclosure and R&D intensity in Canadian firms than in French firms.

Financial Versus Non-Financial Information

Although R&D is a major productive factor and the principal asset driver of high-tech and science-based companies, information about firms' R&D activities, and their resulting benefits, is often inadequate for investment research and analysis. Indeed, Lev (2001) noted that traditional (accounting-based) information systems fail to provide adequate information regarding a firm's intangibles to enable appropriate decisions by managers, investors and public policymakers. Nevertheless, research such as Entwistle (1999) in Canada, and Gelb (2002) in the U.S., find that firms compensate for less formal GAAP disclosures with a wide range of flexible, and voluntary, supplemental disclosures. In our study however, owing to lower uncertainty avoidance and higher masculinity, we predict that Canadian companies should privilege greater non-financial

information to disclose their R&D activities. In contrast, French firms should be more satisfied providing traditional financial information. Hence our fourth hypothesis:

H4. In disclosing their R&D activities, Canadian firms provide greater amounts of non-financial information than French firms.

Future Expenditures

Based again on the cultural context analysis, notably the higher French predisposition towards uncertainty avoidance, we predict that French firms will be less likely to communicate regarding their future R&D expenditures. Hence, our final hypothesis:

H5. Canadian firms will provide more information about their future R&D expenditures than French firms.

Control Variable: Size

Size has often been identified as an important determinant of firm disclosure (Firth, 1979; Raffournier, 1995; Singhvi & Desai, 1971). We therefore control for size differences between Canadian and French firms to ensure that any differences do not materially affect our results.

DATA COLLECTION

The sample of firms we used for testing our hypotheses are listed companies which recorded an R&D expense in their financial statements, and for which an annual report was available for examination. In total, 76 French companies, each belonging to the SBF 250 Index of the Paris Stock Exchange, and 110 Canadian companies, each listed on the Toronto Stock Exchange, were analyzed.[7] Of the full sample of 186 firms (see Appendix), 28 French and 76 Canadian companies belonged to the high-tech industry (i.e. hardware, software, or biotechnology).

Using content analysis methodology, we analyzed each annual report to identify any R&D disclosure items. Consistent with previous disclosure research (e.g. D'Aveni & MacMillan, 1990; Entwistle, 1999), the unit of measure for an item of disclosure was the sentence, defined in the Concise Oxford Dictionary (1990,

p. 1103) as "a set of words complete in itself as the expression of a thought." Each disclosure item was classified in terms of both its type and location. Disclosure type was based on the six categories used in the Entwistle (1999) study, notably: inputs, outputs, future expenditures, financing, accounting/financial and strategy. The disclosure location was either in the financial statements, management discussion and analysis, or general presentation (i.e. other parts of the annual report). All other variables required for the statistical analysis such as R&D expense, total current operating expenses, and R&D accounting policy were also collected from the annual reports.

RESULTS

Descriptive Statistics

Table 2 provides a general disclosure profile of the sampled firms. On average, Canadian firms disclose more information on their R&D activities, and are also more R&D intensive. A slightly greater proportion of Canadian companies also capitalize their development expenditures.

Inferential Statistics

Overall R&D Disclosure

Our first hypothesis is related to the overall amount of R&D disclosure provided by the firm. For the total sample of 76 French and 110 Canadian firms, a Student *t* test (refer Table 3) confirms the mean disclosure difference is statistically significant ($t = 5.673; p = 0.000$). However, when we break the firms between high-tech and non high-tech, we find a statistically significant difference only for high-tech firms. Hence our first hypothesis is partially supported.[8]

R&D Capitalization

Although in Table 2 we observed proportionately more Canadian companies capitalize their development expenditures (31.8% versus 23.7%), a Pearson Chi-Square test results in a *p*-value of 0.148. Separate tests for high tech ($p = 0.553$) and non high-tech ($p = 0.432$) firms, similarly fail to find a statistically significant difference between French and Canadian firms. Hence, our second hypothesis regarding the greater propensity of Canadian firms to capitalize their R&D expenditures is not supported.

Table 2. Descriptive Statistics.

Country	Quantity of R&D Disclosure[a]				R&D Intensity[b]				R&D Accounting Policy		
	Mean	Max	Min	Median	Mean	Max	Min	Median	Expensed	Capitalized	Total
France	35.4	186	3	29	0.059	0.767	0.000	0.029	58 (76.3%)	18 (23.7%)	76 (100%)
Canada	91.1	350	1	68	0.135	1.000[c]	0.001	0.066	75 (68.2%)	35 (31.8%)	110 (100%)

[a] Quantity of R&D Disclosure is measured by the number of sentences of R&D provided in the firm's annual report.
[b] R&D Intensity is measured by the current year's R&D expense amount as a percentage of total current operating expenses.
[c] One Canadian company, Imutec Corporation, recorded all of its operating expenses as R&D expenses.

Table 3. Overall R&D Disclosures.

Country	Statistic	Total	High-Tech	Non High-Tech
France	Mean	35.4	44.0	30.3
Canada	Mean	91.1	119.5	27.8
	t-Value	5.673	4.605	−0.519
	Significance	0.000	0.000	0.605

R&D Disclosure and Intensity

To test our third hypothesis, we first use the following regression model for the full sample of firms:

$$\text{Info}_i = \alpha_0 + \alpha_1 \text{RD\_Inten}_i + \varepsilon_i \quad (1)$$

where: Info = quantity of R&D disclosure as measured by the number of sentences of R&D provided in the firm's annual report. RD_Inten = current year's R&D expense as a percentage of total current operating expenses.

Using this model, the results in Table 4 suggest a significant link ($p = 0.000$) between R&D disclosure and R&D intensity.

Following from this result, we then perform two regressions, one for French, and one for Canadian firms, to further explore the association between R&D disclosure (Info) and R&D intensity (RD_Inten). The results (not shown) found that in France, there is a statistically significant association between these two variables ($p = 0.021$), however with a very low R^2 (0.07), while in Canada, such an association is much stronger ($p = 0.000$, $R^2 = 0.365$). When these regressions were run separately for high-tech and non high-tech firms, the results only held for Canadian high-tech firms. Hence, our third hypothesis is partially supported.

Table 4. R&D Disclosure and R&D Intensity.

Model 1: $\text{Info}_i = \alpha_0 + \alpha_1 \text{RD\_Inten}_i + \varepsilon_i$

Variable	Unstandardized Coefficients		*t*-Value	Significance
	B	Std. Error		
Constant	42.054	5.002	8.408	0.000
RD_Inten	252.728	25.582	9.879	0.000
$R^2 = 0.347$				

Note: Info = Quantity of R&D Disclosure as measured by the number of sentences of R&D provided in the firm's annual report. RD_Inten = R&D intensity as measured by the current year's R&D expense amount as a percentage of total current operating expenses.

Table 5. Financial Versus Non-Financial Information.

Country	Statistic	Accounting/Financial		Financial Statements	
		Number[a]	Percent[b]	Number[c]	Percent[d]
France ($n = 76$)	Mean	11.8	0.437	7.41	0.300
Canada ($n = 110$)	Mean	4.67	0.076	0.82	0.016
Total ($n = 186$)	Mean	7.6	0.224	3.63	0.132
	t-Value	−6.015	−12.348	−9.011	−9.685
	Significance	0.000	0.000	0.000	0.000

[a] Number of R&D disclosures classified as Accounting/Financial.
[b] Ratio of R&D disclosures classified as Accounting/Financial over the total R&D disclosures in the annual report.
[c] Number of R&D disclosures within the Financial Statements section of the annual report.
[d] Ratio of R&D disclosures within the Financial Statements Section over the total R&D disclosures in the annual report.

Financial vs. Non-Financial Information

Our fourth hypothesis involves the nature of the firms' R&D disclosures and suggests that Canadian firms are more likely to provide more non-traditional information. While Table 2 revealed that French firms disclose on average less R&D information than their Canadian counterparts (35.4 versus 91.1), Table 5 shows that both in absolute and relative value terms, French firms' disclosures are both more likely to be of an accounting/financial nature, and to be located in the financial statements (all p-values = 0.000). These results hold when splitting the sample between high-tech and non high-tech. Hence, our fourth hypothesis is supported.

Future Expenditures

Our final hypothesis predicted that Canadian firms would be more likely to provide R&D disclosure with a future orientation. The results in Table 6 are in line with this

Table 6. Future R&D Expenditures.

Country		Future R&D Expenditures	
		Number[a]	Percent[b]
France ($n = 76$)	Mean	0.092	0.003
Canada ($n = 110$)	Mean	3.38	0.035
Total ($n = 186$)	Mean	2.04	0.022
	t-Value	4.991	5.359
	Significance	0.000	0.000

[a] Number of R&D disclosures classified as future expenditures.
[b] Ratio of R&D disclosures classified as future expenditures over the total R&D disclosures in the annual report.

Table 7. Size of Two Sample Firms.

Country	Statistic	Size
France ($n = 76$)	Mean	23.19
Canada ($n = 110$)	Mean	19.76
	t-Value	−10.703
	Significance	0.000

Note: Size = Logarithm of total assets.

prediction. Specifically, Canadian firms provide an average of 3.38 future-oriented R&D disclosures, while French firms are hesitant to provide any such disclosure (mean = 0.092). This difference is statistically significant at $p = 0.000$. There is also a statistically significant difference ($p = 0.000$) when the disclosure is considered in percentage terms. These results hold for both high-tech and non high-tech firms.

Control for Size

We need to control that our results are not materially influenced by a potential size difference between the two sample-firms. Table 7 shows that French firms are larger than Canadian firms, and that the difference is statistically significant ($p = 0.000$).[9] However, this size difference works against all our hypotheses, as larger firms have generally been found to disclose more information. In our study, French firms disclose less information. Hence, we provide evidence that environmental factors, such as culture, can exert a strong influence on disclosure, irrespective of firm size.

SUMMARY

In this study, we compared the R&D disclosure practices in France and Canada, as evidenced in a sample of listed firms' annual reports. In so doing, we add to the growing body of research in international accounting, and to our understanding of environmental determinism theory. Using this theory, we expected disclosure differences in French and Canadian firms due in particular to differing capital markets and inherent cultural divergences.

As predicted, we found that Canadian firms provided significantly more information on their R&D activities than French companies, notably those in the hardware, software or biotechnology industries. This result is consistent not only with the greater disclosure pressures faced by Canadian firms within their capital markets, but also with the full disclosure and transparency philosophy more notable in Canada than in France. We also observed a significant positive

correlation between R&D disclosure and R&D intensity among Canadian high-tech firms. This suggests that Canadian R&D intensive firms are more willing to disclose their R&D activities, perhaps to decrease the firm's monitoring costs and the cost of capital, while their French counterparts privilege secrecy over disclosure. Canadian firms also use more non-financial information to disclose their R&D activities, while French firms restrict themselves to providing more traditional accounting and financial information. Canadian firms are also more willing to disclose information regarding their future R&D expenditures. Finally, we noticed a slightly increased tendency of Canadian firms to capitalize their R&D expenditures, however, the difference between the two countries was not statistically significant.

NOTES

1. Published on April 29, 1999 by the *Comité de la réglementation comptable* (Accounting Regulation Committee).

2. Notably, even the "listed" French companies included in our study still demonstrate the characteristics of a more "traditional" financial market model. For example, L'Oréal, Michelin and Bouygues are still controlled by their respective founders, while Renault and France Telecom are still owned by the French state, and EADS by several European states.

3. According to Gray et al. (1984), stock exchanges appear to have been one of the predominant forces in the emergence of public corporate disclosure.

4. Refer to Gray (1988) for a fuller description of these four values.

5. In his research, Gray defined conservatism as "a preference for a cautious approach to measurement so as to cope with the uncertainty of future events as opposed to a more optimistic, laissez-faire, risk-taking approach." He also noted that "conservatism varies according to country, ranging from a strongly conservative approach in the continental European countries, such as France and Germany, to the much less conservative attitudes of accountants in the U.S.A. and U.K." In contrast, other researchers explore conservatism by concentrating on the relationship between accounting earnings and market value of the firm. According to this second viewpoint, conservatism exists in accounting where there is more timely recognition in earnings of bad news regarding future cash flows than good news (Basu, 1997). Following this definition, research (e.g. Ball et al., 2000) found that common law countries (e.g. Canada) have a more conservative accounting than code law countries (e.g. France), and that countries with developed capital market have a more conservative accounting than those dominated by family-owned firms (Ball et al., 2003). In our research, we adopt Gray's definition since it is most commonly used by culture-based research in accounting.

6. These disclosures include short qualitative discussion, extended qualitative discussion, footnote discussion, or journal entries recorded in financial statements (Gamble et al., 1996).

7. The original Entwistle (1999) study had 113 firms. The French company data was for the year 2000 while the Canadian company data was for years 1993–1995. Arguably, since 1995, due to increased globalization of capital markets, one could expect an increased level of disclosure by French companies, hence working against the predicted hypotheses.

8. These non high-tech firms were described as "traditional" in Entwistle (1999), and include such industries as household goods, mining, utilities, and oil and gas.
9. The results also hold for the high-tech firms.

ACKNOWLEDGMENTS

The authors would like to thank Bernard Raffournier for his helpful comments. They also acknowledge participants at the following conferences: CRECCI (2002, University of Bordeaux IV) and EAA Annual meeting (2003, Sevilla). Any remaining errors or omissions are our own. Yuan Ding and Hervé Stolowy would like to acknowledge the financial support of the HEC Foundation and the Research Center at the HEC School of Management (project F013). Both are Members of the GREGHEC, unité CNRS, FRE-2810.

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APPENDIX

List of Sample Firms

French Companies ($n = 76$)

Air Liquide	Exel Industries	Pinguely Haulotte
Alcatel	Faurecia	Plastic Omnium
Alstom	Fininfo	Radiall
Altran Technologies	France Telecom	Renault
Arkopharma	Gemplus International	Rhodia
Aventis	Genesys	Saint-Gobain
Bolloré Investissement	GFI Industries	Sanofi-Synthélabo
Bouygues	GFI Informatique	Schneider Electric
Bouygues Offshore	Groupe Silicomp	Seb
Bull	Highwave Optical	Séché Environnement
Business Objects	Infogrames	Soitec
Carbone Lorraine	Ingenico	S. T. Dupont
Cegid	Ipsos	STMicroelectronics
Ciments Français	Lapeyre	Thales
Clarins	Lectra	Thomson Multimedia
Coflexip	L'Oréal	Transiciel
Compagnie Générale de Géophysique	Metrologic Group	Usinor
Dalloz	Michelin	Valeo
Damart	Nexans	Vicat
Danone	Nicox	Virbac
Dassault Systèmes	Oberthur	Vivendi Environnent
EADS	Orange	Vivendi Universal
Eramet	PCAS	Wanadoo
Essilor	Péchiney	Wavecom
Eridania Béghin-Say	Pernod Ricard	
Eurofins Scientific	Peugeot PSA	

Canadian Companies ($n = 110$)

ABL Canada Inc.	Domtar Inc.	National Hav-Info
Accugraph Corporation	Dorel Industries Inc.	Newbridge Networks
Advanced Gravis	DuPont Canada Inc.	NII Norsat International
Alcan Aluminum	Dusa Pharmaceuticals	Northern Telecom Limited
Allelix Biopharmaceuticals	DY 4 Systems Inc.	OCS Technologies
Alta Genetics	Eicon Technology	Offshore Systems
AIT Advanced Info	Electrohome Limited	Plaintree Systems
AlphaNet Telecom	Epic Data International	Potash Corporation
Arrowlink Corp.	Foremost Industries	Promis Systems
ATI Technologies	Gandalf Technologies	QSound Labs, Inc.
Autrex Inc.	Geac Computer	Quadra Logic

APPENDIX (*Continued*)

Biochem Pharma	Gennum Corporation	Quartex Corporation
Biomira Inc.	Global Election Systems	Quebec Telephone
Bioniche Inc.	Glyko Biomedical	Scintrex Limited
Biovail Corporation	GSW Inc.	Scott Paper Limited
BMB Compuscience	Haley Industries Limited	Shaw Industries
CAE Inc.	Hemosol Inc.	Sherritt Inc.
Calian Technology	H. E. R. O. Industries	Sico Inc.
Cameco Corporation	Hummingbird Commun.	Sidus Systems Inc.
Canadian Marconi	Imasco Limited	SNC Lavalin Group Inc.
Cangene Corporation	Imutec Corporation	Softkey International
Canstar Sports Inc.	Inco Limited	Sony Corporation
CCL Industries Inc.	Intera Information	Spar Aerospace Limited
Cinram Ltd.	International Murex	Spectrum Signal
C-MAC Industries	International Retail Systems	Speedware Corporation
Cognos Incorporated	International Verifact Inc.	SR Telecom Inc.
Cominco Ltd.	ISG Technologies Inc.	Synergistics Industries
Computalog Ltd.	Lafarge Corporation	Tee-Com Electronics Inc.
Contintental Pharma	LSI Logic Corporation	Teleglobe Inc.
Corel Corporation	MDS Health Group	Telepanel Systems Inc.
D. A. Stuart Ltd.	Memotec Communications	TIE Telecommunications
Delrina Corporation	Microbix Biosystems	Triple Crown Electronics
Deprenyl Animal Health	Microstar Software	TSB International
Deprenyl Research	Mitel Corporation	Unican Security
Develcon Electronic	Modatech Systems	Varity Corporation
Disys Corporation	Moore Corporation Limited	Xillix Technologies
DMR Group Inc.	Mosaid Technologies	

EFFECTS OF CORRUPTION ON EARNINGS OPACITY INTERNATIONALLY

Ahmed Riahi-Belkaoui

ABSTRACT

This paper explains the impact of corruption on the level of earnings opacity internationally. The results of a regression of measures of earnings opacity on corruption show a significant relationship between the level of corruption and the level of earnings opacity after controlling for economic development, human development, economic freedom, and size of government.

INTRODUCTION

The quantity and quality of accounting information is crucial to economic and human development internationally (Belkaoui & Maksy, 1985; LaPorta et al., 1999; Riahi-Belkaoui, 1995, 1996, 1998, 1999; Wallace & Gernon, 1991). The major threat to the quality of information is the phenomenon of earnings opacity. It may be easily defined as the measure that reflects how little information there is in a firm's earnings number about its true, but unobservable, economic performance (Bhattacharya et al., 2002). The variations in earnings opacity internationally suggest the presence of local factors that act as major determinants of its level and change. The major promise of this paper is that the level of corruption existing in a particular country is a major determinant of the level of earnings opacity as

Advances in International Accounting
Advances in International Accounting, Volume 17, 73–84

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17004-9

the illegal rents created by corruption need to be at most "camouflaged," and that is most feasible with earnings management. Accordingly, this study investigates whether the level of corruption in a given country affects earnings opacity in general or its components, namely, earnings aggressiveness, loss avoidance, and income smoothing. The results of a regression of earnings opacity or its components on the level of corruption indicates a negative relative relationship between the lack of corruption and the level of earnings opacity for a sample of 34 countries, before and after controlling for economic development, human development, economic freedom and size of government.

EARNINGS OPACITY AND CORRUPTION

Corruption exists in all societies and has a definite negative influence on investment, growth and the political behavior of citizens (Easterly & Levine, 1997; Ehrlich & Lui, 1999; Kaufman et al., 1999; Knack & Keefer, 1995). It has been defined as the misuse of public or business office for private gain. The general consequences of corruption are the thwarting of growth and investment (Mauro, 1995), and the creation of a serious obstacle to attempts to consolidate democratic institutions and open market economies (Schleifer, 1997; Schleifer & Vishny, 1993). One consequence largely ignored in the economic and accounting literature is the impact of corruption on the quality of accounting. The premise of this study is that the lack of corruption will decrease earnings opacity, used as a measure of the quality of accounting. Two arguments may be used to justify this thesis of a negative relationship between the lack of corruption and earnings opacity as follows:

(1) Corruption is the misuse of a public or business office for private gains. It involves transfer payments from bribe players to bureaucrats or business people. In a world in which the actions of a policy maker or bureaucrat (as well as their consequences) are only partly observable to citizens, the former have incentives to appropriate parts of the latter's income (Asdera et al., 2001). This rent seeking behavior needs to be as "hidden" as possible and therefore needs a system of accountability flexible enough to "camouflage" the actions and consequences of corruption. It amounts to the need for a lower quality accounting for manufacturing a higher level of corruption.
(2) Corruption creates an unethical atmosphere that forces individuals to accept the appropriation of other people's income as acceptable. The low level of corporate ethics, resulting from corruption, extends easily to other activities involving the collection and dissemination of information in general and

accounting information in particular. One would expect a low quality of accounting from a country that tolerates or fails to reduce corruption.

The two arguments imply that the level of accounting quality is a direct result of the level of corruption. One obvious manifestation of a low level of accounting quality is the high level of earnings opacity (Bhattacharya et al., 2002). Earnings opacity, like earnings management, may be defined as the alteration or design of a firm's reported economic performance by insiders to either "mislead some stakeholders" or "to influence contractual outcome" (Healey & Wahlen, 1999). It is conditional on the level of corruption prevailing in a particular country. Accordingly, to estimate the causes of variations in earnings opacity, we use the following regression model:

$$\text{Earnings Opacity Index} = \alpha_0 + \alpha_1 \text{lack of corruption index} + \alpha_3 \text{control variables} + \varepsilon_I \quad (1)$$

The model assumes a negative relationship between the level of earnings opacity and the level of the lack of corruption in a given country. The dependent, independent and control variables are explained next and measured for a sample of 34 countries.

METHODOLGY

Dependent Variable: Earnings Opacity

The quality of accounting in a given country is measured by three dimensions of earnings opacity – earnings aggressiveness, loss avoidance, and earnings smoothing, where opacity is viewed as a complex interaction between the three factors of managerial motivation, accounting standards and the enforcement of accounting standards (audit quality) (Bhattacharya et al., 2002). In brief, earnings are opaque because of: (a) the motivation of managers to manipulate earnings; (b) the accounting standards are either loose or just bad; and (c) the enforcement is lax. The three measures of earnings opacity derived from the study by Bhattacharya et al. (2002) are explicated and measured as follows:

(1) Earnings aggressiveness, the opposite of accounting conservatism, results from the tendency of managers to increase reported earnings, numbers (to understand these managerial motivations, see, for example, Rangan (1998), Teoh et al. (1998), Shivakumar (2000), Healy (1985) and Barth et al. (1999). It is expected to be positively related to earnings opacity, as it is the tendency to

delay the realization of losses and speed the realization of gains. It is measured at a point in time as the median for country i, year t, of accruals divided by lagged assets.[1]

Scaled accruals are defined as follows:

$$\mathrm{ACC}_{kt} = \frac{\Delta\mathrm{CA}_{kt} - \Delta\mathrm{CL}_{kt} - \Delta\mathrm{CASH}_{kt} + \Delta\mathrm{STD}_{kt} - \mathrm{DEP}_{kt} + \Delta\mathrm{TP}_{kt}}{\mathrm{TA}_{kt-1}} \tag{2}$$

where: ACC_{kt} = Scaled accruals for firm k in year t; $\Delta\mathrm{CA}_{kt}$ = Change in total current assets for firm k in year t; $\Delta\mathrm{CL}_{kt}$ = Change in total current assets for firm k in year t; $\Delta\mathrm{CASH}_{kt}$ = Change in cash for firm k in year t; $\Delta\mathrm{STD}_{kt}$ = Change in current portion of long-term dept included in total current liabilities for firm k in year t; DEP_{kt} = Depreciation and amortization expense for firm k in year t; $\Delta\mathrm{TP}_{kt}$ = Change in income taxes payable for firm k in year t; TA_{kt-1} = Total assets for firm k in year $t-1$.

The higher the median observation of scaled accruals of country i in year t, the higher is the earnings aggressiveness in country i in year t.

(2) Loss avoidance behavior is the second measure of earnings opacity following evidence that U.S. firms engage in earnings management to avoid reporting negative earnings (Burgstahler & Dichev, 1997; Degeorge et al., 1999; Hayn, 1995). It is measured by the ratio of the number of firms with small positive earnings minus the number of firms with small negative earnings divided by their sum. The higher the ratio for country i in year t, the higher is the loss avoidance in country i in year t.

(3) Earnings smoothing is the third measure of earnings opacity as artificially smoothed earnings fail to depict the swings in underlying firm performance, and increase earnings opacity. It is measured by the cross-sectional correlation between the change in accruals and the change in cash flows, both scaled by lagged total assets, in country i in year t. The lower this correlation in country i in year t, the higher is the earnings smoothing in country i in year t.

Bhattacharya et al. (2002) computed these three measures of earning opacity for a sample of 34 countries for the 1985–1998 period. They are shown in Table 1. An average of the three measures is also used in this study as a measure of the earnings opacity and accounting quality for each country.

Independent Variable: Corruption

Six comprehensive indicators of the quality of government have been gathered by Kaufman et al. (1999a, b). Based on observations between 155 and 173 countries

Table 1. Measures of Earnings Opacity and Corruption for 34 Sample Countries from 1985–1998.

Country	EAG	LA	ES	AVR	CORR
Australia	6.0739	4.0769	4.6923	4.9487	1.6011
Austria	4.5833	6.0833	5.6944	5.4570	1.4571
Belgium	2.0769	5.0769	4.4103	3.8547	0.6717
Brazil	6.8750	3.6250	4.3750	4.9583	0.0576
Canada	4.6154	5.3077	4.4872	4.8034	2.0555
Chile	6.6000	7.2000	7.0000	6.9333	1.0292
Denmark	4.0909	4.9091	5.3636	4.7879	2.1290
Finland	4.3846	6.6923	5.6410	5.5726	2.0846
France	4.1538	4.9231	4.6410	4.5726	1.2824
Germany	3.4614	6.3077	5.4615	5.0769	1.6103
Greece	8.8889	7.2222	7.8889	88.0000	0.8248
Hong Kong	7.3333	5.4167	6.0000	6.2500	1.3133
India	8.2857	7.7143	7.0476	7.6825	−0.3058
Indonesia	8.0000	8.0000	7.1429	7.7143	−0.7989
Ireland	5.9231	4.8462	5.7949	5.5214	1.5673
Italy	5.2308	6.3077	6.5897	6.0427	0.8023
Japan	6.6154	6.6154	6.9487	6.7265	0.7236
Korea	7.9000	6.2000	7.2917	7.1306	0.1592
Malaysia	7.6923	6.2308	6.5385	6.8205	0.6334
Mexico	6.8889	3.7778	4.4815	5.0494	−0.2771
Netherlands	3.3077	5.6154	5.5128	4.8120	2.0264
Norway	4.7273	4.6364	4.0000	4.4545	1.6865
Pakistan	5.8571	7.0000	6.6190	6.4921	−0.7688
Portugal	1.5000	5.1667	4.0000	3.5556	1.2179
Singapore	6.2222	6.1111	6.1111	6.1481	1.9468
South Africa	6.6923	5.9231	6.2564	6.2906	0.2989
Spain	4.1818	6.3636	5.0606	5.2020	1.2143
Sweden	6.0769	5.0769	5.4103	5.5214	2.0853
Switzerland	3.9231	6.5385	5.4103	5.2906	2.0717
Taiwan	6.3333	7.5000	6.1111	6.6481	0.6257
Thailand	4.7143	7.5700	5.7143	6.0000	−0.1648
Turkey	10.0000	7.3333	6.2222	7.8519	−0.3489
U.K.	5.2308	4.9231	5.0769	5.0769	1.7065
USA	4.0769	4.4615	3.5128	4.0171	1.4068

Note: EAG = Earnings aggressiveness as defined by Bhattacharya et al. (2002); LA = Loss avoidance as defined by Bhattacharya et al. (2002); ES = Earnings smoothing as defined by Bhattacharya et al. (2002); AVR = Average of EAG, LA and ES; CORR = measure of corruption as defined by Kaufman et al. (1999a).

in 1997–1998, these indictors were constructed by merging data drawn from both polls of experts, which reflect country ratings (on a global or regional basis) and cross country surveys of firms or citizens carried out by international and nongovernmental organizations.[2] The six aggregate indicators correspond to six basic governance concepts: voice and accountability, political instability and violence, governmental effectiveness, regulatory burden, rule of law, and graft or corruption.[3]

The last concept of graft or corruption was used in this study as the main dependant variable. The concepts used to measure the level of corruption come from various sources and are shown in Table 2. The corruption measure, providing an indicator of subjective perceptions of public corruption, is shown in Table 1. A higher index indicates lower corruption. Therefore, the dependant variable may be understood as the lack of corruption. The countries included in Table 1 constitute our sample for the investigation of the potential relationships between the lack of corruption and earnings opacity.

Control Variables

The following stack of control variables is introduced to test the robustness of our measures:

(1) "Economic Development," measured through the log of gross national product. The data, taken from the World Bank correspond to the 1985–1998 average gross national product.
(2) "Human Development," measured by the U.N. Human Development Index (HDI) for 1998. (United Nations, 1991). It is generally considered as a more realistic measure of human development than mere GNP per head. The HDI is composed of three indicators, life expectancy, education, and income.
(3) "Size of Government," measured by the 1998 proportion of governmental expenditure over gross national product.
(4) "Economic Freedom" measured by the Economic Freedom Index from 1975–1995.[4]

The regression model in Eq. (1) was used to develop the following five models for estimating earnings opacity:

$$\text{Earnings Opacity Index}_{\text{EAG}} = \beta_0 + \beta_1 \text{CORR} \tag{3}$$

$$\text{Earnings Opacity Index}_{\text{LA}} = \beta_0 + \beta_1 \text{CORR} \tag{4}$$

Table 2. Concepts Measured for Corruption.

Code	Concepts Measured
Representatives sources	
Standard and Poor's DRI/McGraw Hill (DRI)	Corruption among public officials, effectiveness of anticorruption initiatives
Economic Intelligence Unit (EIU)	Corruption among public officials
Political Risk Services (PRS)	Corruption in the political system as a "threat to foreign investment"
World Bank (WDR)	Frequency of "additional payments" to "get things done" Corruption as "obstacle to business"
Non-representative sources	
Business Environment Risk Intelligence (BERI)	Mentality regarding corruption
Wall Street Journal (CEER)	Effect of corruption on "attractiveness of country as a place to do business"
Freedom House (FHNT)	Perceptions of corruption in civil service, business interests of policymakers
Gallup International (GALLUP)	Frequency of "cases of corruption" among public officials
World Economic Forum 98 (GCS98)	Irregular, additional payments connected with import and export permits, business licenses, exchange controls, tax assessments, police protection or loan applications
World Economic Forum 97 (GCS97)	Frequency of "irregular payments" to officials and judiciary
World Economic Forum (GCSA)	Irregular, additional payments connected with import and export permits, business licenses, exchange controls, tax assessments, police protection or loan applications. Corruption as an obstacle to business development
Political Economic Risk Consultancy (PERC)	Effect of corruption on business environment for foreign companies
Institute for Management Development (WCY98)	Improper practices in the public sphere

$$\text{Earnings Opacity Index}_{\text{ES}} = \beta_0 + \beta_1 \text{CORR} \tag{5}$$

$$\text{Earnings Opacity Index}_{\text{AVR}} = \beta_0 + \beta_1 \text{CORR} \tag{6}$$

where: EAG = earnings opacity as measured by earnings aggressiveness; LA = earnings opacity as measured by loss avoidance; ES = earnings opacity as measured by earnings smoothing; AVR = average of EAG, LA, and ES; CORR = indicator of subjective perceptions of public corruption.

$$\text{Earnings Opacity Index} = \beta_0 + \beta_1 \text{CORR} + \beta_2 \log \text{GNP} + \beta_3 \text{HDI} + \beta_4 \text{EFI} + \beta_5 \frac{\text{GE}}{\text{GDP}} \quad (7)$$

where: log GNP = measure of economic development; HDI = United Nations Human Development Index; EFI = Economic Freedom Index; GE/GDP = size of government as measured by government expenditures/GDP.

Using the data in Table 1, the first four models were used to obtain individual measures of earnings opacity based on earnings aggressiveness (EAG), loss avoidance (LA), earnings smoothing (ES), and the average of EAG, LA, and ES (AVR). The fifth model was used to obtain an overall measure of earnings opacity adding the control variables log GNP, HDI, EFI, and GE/GDP to CORR as dependent variables.

RESULTS

The results for model 1 through 4 are shown in Table 3. These results show that the individual earnings opacity measures based on earnings aggressiveness (EAG), loss avoidance (LA), earnings smoothing (ES), and average earnings opacity (AVR), have a significant negative relationship with the lack of corruption variable with an R^2 ranging from a low 12.7% in the case of loss avoidance to a high of 27.83% in the case of the average earnings opacity. As hypothesized, the earnings opacity is negatively related to the lack of corruption in a given country.

Model 5 introduces the four control variables to assess the robustness of the previous results. Economic development as measured by log GNP, economic freedom as measured by an index of economic freedom and size of government as measured by the level of government expenditures/GDP have a negative and statistically significant relationship with earnings opacity indicating that the quality of accounting is increasing in the size of the economy, the level of economic freedom and the size of the government. However, human development as measured by the UN Human Development index has a positive and significant relationship indicating that the quality of accounting is decreasing in human development. Model 5 registers a high R^2 of 40.98%. The F statistics for the five models range from a low of 5.83 to a high of 14.89. The RESET (regression specification error list) as suggested by Ramsey (1969) and Thursby (1981, 1985), and the Hausman test as suggested by Hausman (1978), was also used as specification tests. The results of the RESET test, used to check for omitted variables, incorrect functional form, and non-independence of regressors, show that the model used in this study was not mis-specified.

Table 3. Effects of Corruption on Earnings Opacity (*t*-Values in Parentheses).

Model	Expected Sign	Earnings Opacity Index				
		EAG 1	LA 2	ES 3	AVR 4	Overall 5
Intercept	?	6.815 (16.22)*	6.417 (22.63)*	6.141 (23.75)*	6.457 (25.07)*	11.044 (3.42)
Corruption	–	−1.165 (−3.66)*	−0.518 (−2.41)*	−0.484 (−2.47)*	−0.722 (−3.70)*	−0.299 (−3.47)*
Log GNP	–					−0.655 (−3.13)*
HDI	+					3.653 (−3.60)*
EFI	–					−0.739 (−3.26)*
GE/GDP	–					−0.009 (−3.59)*
Adjusted R^2		27.33%	12.76%	13.44%	27.83%	40.98%
F Statistic		13.41*	15.83*	6.12*	13.73*	14.89*

Note: Model 1 : Earnings Opacity $\text{Index}_{\text{EAG}} = \beta_0 + \beta_1 \text{CORR}$; Model 2 : Earnings Opacity $\text{Index}_{\text{LA}} = \beta_0 + \beta_1 \text{CORR}$; Model 3 : Earnings Opacity $\text{Index}_{\text{ES}} = \beta_0 + \beta_1 \text{CORR}$; Model 4 : Earnings Opacity $\text{Index}_{\text{AVR}} = \beta_0 + \beta_1 \text{CORR}$; Model 5 : Earnings Opacity Index $= \beta_0 + \beta_1 \text{CORR} + \beta_2 \log \text{GNP} + \beta_3 \text{HDI} + \beta_4 \text{EFI} + \beta_5 \text{GE/GDP}$.

CONCLUSIONS

In this paper, we have explored the causes that underlie the wide variations in earnings opacity internationally. Our explanation rests on the impact of corruption as it uses the lack of accounting quality to "camouflage" the ill-gained results. High corruption uses or creates a low quality accounting that is compatible with the unethical behavior of rent misappropriation or is a direct result of the unethical atmosphere. In effect, this study presents empirical results on the impact of corruption on different measures of earnings opacity. Based on a data set from 34 countries, the results of a regression model show a negative relationship between earnings opacity and the lack of corruption after controlling for economic development, human development, size of government and economic freedom. Where corruption is lower, the demand for earnings opacity is lower. Corruption creates a climate conducive to a low quality accounting.

NOTES

1. Teoh and Wong (2002) presents some indirect evidence that scaled accruals affects earnings opacity by affecting analysts' forecast errors.

2. The aggregate indicators for each cluster were estimated by means of unobserved components model which expresses the observed data in each cluster as a linear function of the unobserved, common components of governance, plus the disturbance term capturing perception error/or sampling variation in each indicator (Kaufman et al., 1999b).

3. Kaufman et al. (1999a) provide evidence of a strong causal relationship from better governance to better development outcomes.

4. The economic freedom index is made possible by the meticulous work of the Fraser Institute, the results of which were published in *Economic Freedom of the World 1975–1995* by James D. Gwartney et al. (1996). The index of economic freedom has 17 components that are allocated to four major areas: (1) money and inflation; (2) government operations and regulations; (3) takings and discrimination taxation; and (4) international exchange. In aggregating these components of economic freedom into a summary index, various alternatives are used to attach different weights to the components. This results in five possible summary indices: (a) an equal impact index: Ie; (b) a survey of knowledgeable people based index: Isl; (c) a survey of a large number of people based index: IS2; (d) an average of the above three indices: AVG; and (e) a letter grade index: GRADE. AVG will be used in this study to measure the economic freedom of the countries investigated.

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DISTRIBUTIONAL PROPERTIES AND TRANSFORMATION OF FINANCIAL RATIOS: THE IMPACT OF THE ACCOUNTING ENVIRONMENT

Jussi Nikkinen and Petri Sahlström

ABSTRACT

This study investigates the distributional properties of financial ratios and the usefulness of the Box and Cox (1964) power transformation in normalizing financial ratios in different kinds of accounting environments. The results indicate that the Box-Cox power transformation can substantially improve the normality of financial ratios. The transformation can completely remove the non-normality induced by skewness. However, some kurtosis remains after the transformation. The distributional properties and the usefulness of the transformation are not dependent on the accounting environment. Therefore, researchers can use same financial ratios in different accounting environments. However, some caution is needed in the case of profitability ratios that are substantially affected by the accounting practices and economic situation.

INTRODUCTION

This paper examines distributional properties and the transformation of financial ratios in different accounting environments. Many of the studies in accounting

Advances in International Accounting
Advances in International Accounting, Volume 17, 85–101

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17005-0

rely on the assumption of normality of financial ratios and this issue has therefore received a great deal of attention in accounting literature. Despite the required normality, financial ratios are highly non-normal as reported for example, by Deakin (1976), Buijink and Jegers (1986), Ezzamel and Mark-Molinero (1990), and Kallunki (1998). Furthermore, these studies suggest that non-normality is an international phenomenon.

Non-normality of financial ratios may be caused by the lack of proportionality between the numerator and denominator of financial ratios as Barnes (1982) shows. Non-normality of financial ratios may also be caused by their definitions. Some financial ratios such as quick ratio and current ratio are limited to be greater than zero and some ratios such as equity to total capital ratio have an upper limit of 100%. In addition, differences in accounting practices, in financial characteristics of companies, in business culture and in economic situations across countries can be expected to affect the distributions of financial ratios.[1]

The purpose of this study is to investigate the distributional properties of financial ratios and the usefulness of the Box and Cox (1964) transformation in normalizing the distribution of financial ratios in different accounting environments. For this purpose, the distributional properties of a set of commonly used accrual-based financial ratios and market-based financial ratios are analyzed in ten different countries. The countries are selected on the basis of the theoretical classification system of financial reporting practices by Nobes (1983, 1998). The accrual-based financial ratios used in the study represent four key economic dimensions of a firm, i.e. profitability, financial leverage, liquidity and efficiency (see e.g. Foster, 1986). In addition to these ratios, a set of commonly used market-based financial ratios is analyzed.

The results of the study have important implications for researchers and financial analysts since statistical tests and methodologies used in accounting studies and analyses often assume that ratios are normally distributed. Statistical tests such as the standard *t*- and *F*-tests, tests of equality of covariance matrices and the Box test for homogeneity of variance (Stevens, 1996) are affected by non-normality due to the skewness and kurtosis of the distributions (Barnes, 1987; Mardia, 1974). In addition, for example, the linear discriminant analysis is based on the assumption of multivariate normality (Eisenbeis, 1977). Furthermore, the statistical inference based on the OLS requires the assumption of normality of the dependent variable.

This paper contributes to the existing literature in the three main respects. First, it investigates the impact of different accounting environments on the distributional properties of financial ratios and the usefulness of the Box-Cox power transformation. By so doing, it extends the studies by Watson (1990) and Kallunki (1998), who investigate the issue using data from one country. The results of this

study provide guidelines as to which ratios should be used in international financial ratio studies.

Second, the study investigates whether the non-normality of financial ratios is due to skewness or kurtosis. Based on theory, some ratios are expected to be skewed as a result of the technical lower or upper bounds. Furthermore, the lack of proportionality between the numerator and denominator of financial ratios may affect both skewness and kurtosis. In this paper, tests for skewness and kurtosis are used to investigate whether the financial ratios behave according to these expectations. Furthermore, the tests are used to detect whether the Box-Cox power transformation can be applied to remove a particular cause of non-normality.

Third, the study extends the current literature on the distributional properties of financial ratios such as Kallunki (1998) since both market-based financial ratios and accrual-based financial ratios are examined. This is important since, although market-based financial ratios are widely applied in accounting studies, their distributional properties have received relatively little attention.

TRANSFORMATION OF FINANCIAL RATIOS

Financial ratios rather than absolute values of financial variables are used because of the need to control for the effect of size on the financial variable (see Barnes, 1987). To control for the size effect, financial variables x_t and y_t are required to be strictly proportional, i.e. $y_t = z_t x_t$. Under the proportionality condition the financial ratio z_t is then determined by:

$$z_t = \frac{y_t}{x_t} \tag{1}$$

The strict proportionality condition is violated if there exists a non-zero intercept term α_t implying that $y_t = \alpha_t + z_t x_t$. This violation leads to non-normality of the distribution of a financial ratio z_t.[2]

α, x_t and y_t may depend, for example, on the state of the macro economy and cultural and institutional differences in the business environments of companies. Consequently, differences in the distributions of financial ratios across countries may be induced by differences in accounting practices, differences in the financial characteristics of companies, differences in business culture, and differences in the state of macro economy. Moreover, the proportionality assumption is violated if the relationship between x_t and y_t is non-linear by nature.

In addition to accounting environmental aspects, some financial ratios (for example, quick ratio and equity to total capital) are bounded since x_t or/and y_t are bounded, which causes non-normality. Based on these bounds distributions of

financial ratios should exhibit different shapes. For example, the lower bound can be expected to lead to a positively skewed distribution.

A non-normal financial ratio z_t can be transformed to a normally distributed variable with mean μ and variance σ^2 by assuming that there exists a value λ such that $z_t^{(\lambda)} = (z_t^{\lambda} - 1)/\lambda$ for $\lambda \neq 0$ and $z_t^{(\lambda)} = \log(z_t)$ for $\lambda = 0$ (see Box & Cox, 1964).[3] The value of the parameter vector $\theta' = (\lambda, \mu, \sigma^2)$ can be estimated by maximizing the log-likelihood function

$$\ell = -\frac{n}{2}\ln(2\pi) - \frac{n}{2}\ln\sigma^2 - \frac{1}{2\sigma^2}\sum_{t=1}^{n}(z_t^{(\lambda)} - \mu)^2 + (\lambda - 1)\sum_{t=1}^{n}\ln z_t, \qquad (2)$$

where n is the sample size. In the case of a negative value of the financial ratio a positive constant c is added which ensures positivity of the variable $z_t + c$ to be transformed. The error terms in the model are not normally distributed except for $\lambda = 0$ since $z_t^{(\lambda)}$ is bounded and hence the Cox-Box maximum likelihood estimator of θ is actually a pseudo maximum likelihood estimator (Amemiya, 1985, p. 250). Hypotheses testing can be performed using asymptotic normality of the maximum likelihood estimator (Judge et al., 1985, p. 842).

The transformation contains the untransformed case ($\lambda = 1$) and the logarithmic transformation ($\lambda = 0$) as well as the frequently used square root ($\lambda = 1/2$) and cubic root transformations ($\lambda = 1/3$) as special cases and it is therefore particularly attractive.[4] The normality of the financial ratio may be directly tested by testing the hypothesis H_0: $\lambda = 1$. Similarly, it would be possible to test, for example, whether taking logs of z_t would yield the desired normality. Unconditional standard errors need to be used in hypotheses testing (see Spitzer, 1982).

DATA DESCRIPTION

The sample consists of firms from the following 10 industrial countries: Finland, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom and the United States. The selection of the countries is based on the classification of international financial reporting practices by Nobes (1983, 1998). The selected countries cover all the different classes in these classifications. Moreover, there is evidence on the existence of differences in accounting practices across countries. For example, Rees (1998) investigates the differences in accounting practices among fourteen European countries, including all the European countries in the present sample, and finds that only two pairs of countries have similar accounting practices.

The fundamental reason for the differences in accounting practices is the different use of accruals. The primary use of accrual is to better match revenues and expenses (see e.g. Cheng et al., 1996; Dechow, 1994). However, accruals are also used for other purposes. According to Ball et al. (2000) the differences in the use of accruals in different countries can be expected to reflect differences in underlying institutional settings. Previous literature suggests that legal system, capital market orientation and relationship between accounting and taxation are the main institutional factors affecting accounting practices (see Ball et al., 2000; Bartov et al., 2001; Guenther & Young, 2000; Hung, 2001).

According to Ball et al. (2000) the most fundamental institutional variable causing differences in accounting practices across countries is the extent of political influence on both standard setting and enforcement. Ball et al. (2000) classify countries into two groups based on the origin of the legal system. In code-law countries setting and enforcement occur under codified law in which the role of governmental processes is vital while in common-law countries the market's role is more important (see David & Brierley, 1985 for a survey). The fundament difference causing this classification is the institutional need for accounting information. In code-law countries the stakeholders' need comes first while in common law countries the shareholders' point of view is more important. Ball et al. (2000) hypothesize, and find evidence to support the hypothesis, that demand for timely incorporation of true economic income in accounting income is lower in the code-law countries than in the common-law countries.

A factor closely related to the legal system is whether the country is bank-oriented or market-oriented (see e.g. Ali & Hwang, 2000). In a bank-oriented country the traditional providers of finance are financial institutions instead of private investors. Firms usually have very close ties to just one bank and all the capital needed is raised from this particular bank. Therefore, the bank has direct access to company information. Consequently, the need for published financial statements is small as the firms do not have to access markets to raise capital. On the contrary, in market-oriented countries the main provider of the capital is the capital market. Therefore, firms have to provide reliable and timely information in the form of public financial statements in order to attract investors who do not have direct access to company specific information. The last factor is whether accounting if influenced by taxation. It can be expected that in countries with a close relationship between accounting and taxation the accruals are used to manipulate earnings for taxation purposes (see e.g. Ali & Hwang, 2000 for evidence). Hung (2001) and Leuz et al. (2003) provide detailed information on the differences in these institutional factors, also for the countries used in this study. Their statistics show that the sample of this study includes different kinds of countries in respect of these institutional factors. Moreover, Hung (2001) reported that the use of accruals varies across countries.

Consequently, the sample of this study includes countries with different financial reporting practices. Therefore, it is possible to investigate whether there are differences in distributions of financial variables in different accounting environments before and after the transformation of the ratios. The sample covers listed firms from the selected countries during the period 1996–2000. The ratios are retrieved from the publicly available Worldscope database.

The accrual-based financial ratios used in the study represent four key economic dimensions of a firm, i.e. profitability, financial leverage, liquidity and efficiency (see e.g. Foster, 1986). In addition to these ratios, a set of market-based financial ratios commonly used in stock valuation is analyzed. The profitability ratios are return on investment (ROI), return on equity (ROE) and operating profit margin (OPM). Financial leverage ratios are debt to equity (DE) and equity to total capital (EC). Current ratio (CR) and quick ratio (QR) are used to measure liquidity and inventory turnover (IT) is a proxy for the efficiency. In profitability ratios, the balance sheet items are the beginning values of the fiscal year, whereas the year-end values are used for the leverage ratios. Market based ratios are price to earnings ratio (PE), price to free cash flow ratio (PFCF) and price to book value (PB). Year-end price and book value are used. All market-based financial ratios are restricted to be strictly positive, i.e. zero and negative values are removed from the sample.

Table 1 presents summary statistics for the financial and market-based financial ratios for the year 2000. Only the latest year of the sample is reported to save space. However, the statistics, especially for the third and fourth moments, are similar over time. This is consistent with the findings of Kallunki (1998) with Finnish data. Panel A in Table 1 reports the mean values for the ratios. The results reveal a considerable variation in average across countries. This can also be observed for the standard deviations of the ratios presented in Panel B.

Consistent with the prior expectation, the statistics in Panel C show that financial ratios restricted to be positive by their definitions, i.e. DE, CR, QR, IT, PE, PFCF and PB, exhibit positive skewness. Moreover, EC ratio having both upper and lower limits has slightly negative skewness in all but one country. In the case of the profitability ratios there is no clear pattern for the skewness. Panel D in Table 1 reports the excess kurtosis values for the ratios. All but one ratio, EC, exhibit positive excess kurtosis. In general, with respect to the third and fourth moments the statistics show three classes of financial ratio distributions. The first consists of the profitability ratios exhibiting positive kurtosis but no clear skewness pattern. The second group of ratios with the lower bound exhibiting clear positive skewness and kurtosis. The third group includes only the EC ratio with both lower and upper bounds exhibiting negative skewness and kurtosis.

Table 1. Descriptive Statistics.

Ratio	Finland	France	Germany	Italy	Japan	Netherlands	Spain	Sweden	U.K.	U.S.
# of obs.	97	508	337	170	1,347	139	73	166	1,332	4,261
Panel A: Mean										
ROI	11.01	8.15	10.79	6.83	1.99	12.29	9.98	5.30	5.93	3.33
ROE	17.12	10.60	12.00	10.84	2.21	19.42	15.43	8.66	7.66	3.99
OPM	7.45	5.10	2.34	5.77	4.82	12.95	11.49	3.10	2.21	2.28
DE	59.42	81.60	63.63	143.87	99.69	87.80	101.91	52.27	38.08	67.44
EC	76.80	73.49	74.78	67.44	73.07	71.44	66.94	77.38	82.54	72.22
CR	1.98	1.55	2.17	1.76	1.41	1.59	1.21	2.29	1.99	2.74
QR	1.40	1.15	1.34	1.30	1.05	1.10	0.90	1.65	1.49	2.00
IT	11.79	22.08	10.60	7.35	8.82	11.48	11.52	16.32	15.85	9.70
PE	17.98	25.45	29.22	30.31	28.98	22.95	17.39	23.98	23.74	19.15
PFCF	11.76	14.60	15.37	12.40	11.04	10.90	10.66	18.29	18.97	10.67
PB	2.45	3.13	2.84	2.69	1.23	3.00	2.52	2.81	2.34	2.27
Panel B: Standard deviation										
ROI	11.37	13.10	11.10	6.90	3.97	12.47	6.06	26.92	14.17	14.98
ROE	17.86	19.51	16.87	11.11	8.56	21.73	8.09	36.43	17.80	20.16
OPM	8.33	10.25	7.97	9.81	3.80	17.10	7.86	24.92	33.85	34.54
DE	61.73	76.24	76.11	172.53	104.95	78.45	96.97	60.48	44.30	80.13
EC	17.73	20.30	23.24	25.33	21.77	22.39	17.98	21.04	18.62	25.11
CR	0.98	0.60	1.24	1.13	0.60	0.82	0.52	1.31	1.74	2.00
QR	1.01	0.58	0.89	1.18	0.65	0.67	0.42	1.18	1.63	1.86
IT	13.23	35.96	12.80	7.95	8.00	14.25	11.95	26.75	22.27	11.70
PE	16.27	22.51	32.25	25.54	19.52	29.07	10.00	29.66	21.45	14.42
PFCF	10.97	13.49	20.41	12.50	7.93	8.81	9.89	18.59	21.26	8.59
PB	2.18	2.67	2.18	2.03	0.81	2.57	2.05	2.23	2.13	1.94
Panel C: Skewness										
ROI	0.59	−1.16	0.33	1.14	−0.54	0.30	0.88	−2.14	−0.50	−1.41
ROE	0.70	−1.27	−0.54	0.55	−1.00	0.66	0.96	−2.34	−0.27	−1.06

Table 1. (*Continued*)

Ratio	Finland	France	Germany	Italy	Japan	Netherlands	Spain	Sweden	U.K.	U.S.
OPM	0.08	−1.19	−1.10	−0.91	1.03	1.77	0.67	−2.42	−2.04	−2.97
DE	1.73	1.26	1.41	1.69	1.54	1.01	1.99	1.43	1.42	1.43
EC	−0.53	−0.44	−0.69	−0.46	−0.59	−0.28	0.03	−0.60	−0.85	−0.45
CR	1.76	0.99	1.60	2.89	1.11	2.07	2.61	1.97	2.70	1.74
QR	2.13	1.25	1.44	4.55	1.62	1.79	3.55	2.11	2.77	1.95
IT	3.21	2.84	2.44	2.43	2.37	3.72	3.48	3.25	2.78	2.58
PE	2.53	2.14	2.64	3.80	1.53	3.15	1.73	3.37	1.99	2.09
PFCF	2.12	1.89	2.84	2.75	1.60	2.27	5.08	1.88	2.31	1.93
PB	1.73	1.84	1.84	2.01	1.49	1.53	2.35	1.56	1.88	1.77
Panel D										
ROI	2.43	3.24	0.66	1.27	0.74	1.67	0.23	5.70	1.12	2.18
ROE	1.43	3.06	1.61	0.55	1.59	0.84	1.50	8.39	0.73	0.89
OPM	1.47	4.15	3.61	3.26	0.73	2.36	0.08	7.50	6.46	9.65
DE	3.83	1.11	1.19	1.97	1.83	0.97	4.60	1.41	1.56	1.41
EC	−0.67	−0.90	−0.68	−0.96	−0.68	−1.12	−0.99	−0.84	−0.43	−1.08
CR	3.19	0.37	2.71	11.07	0.91	3.92	11.81	4.05	8.21	2.95
QR	4.89	1.18	1.96	26.88	2.93	2.59	18.54	4.46	8.35	3.75
IT	13.74	8.42	5.61	5.95	6.25	18.06	15.11	11.15	8.28	6.82
PE	8.39	5.17	7.52	23.33	2.26	10.31	2.75	16.54	4.01	4.62
PFCF	4.97	3.56	8.60	9.98	2.38	6.02	32.47	3.67	5.45	4.07
PB	2.90	3.67	3.41	4.01	1.94	1.57	6.49	1.87	3.33	3.01

Note: ROI is return on investment; ROE is return on equity; OPM is operating profit margin; DE is debt to equity; EC is equity to total capital; CR is current ratio; QR is quick ratio; IT is inventory turnover; PE is price to earnings ratio; PFCF is price to free cash flow ratio; PB is price to book value.

As shown in Table 1, the number of observations varies considerably across countries. The sample size is limited to 200 observations in further analysis to make the results comparable across countries. In the case of more than 200 observations/ratio a random sample of 200 observations/ratio is drawn from the original sample.

RESULTS

Table 2 reports the maximum likelihood estimates of λ. As a preliminary test of the normality of the untransformed financial ratios, the hypothesis H_0: $\lambda = 1$ is tested. The λ values significantly different from 1 at the 1% level are shown in bold face. The results suggest that financial ratios are not in general normally distributed. The maximum likelihood estimates of λ are consistently positive for ROI, ROE, OP, DE and EC, whereas the estimates of λ are consistently negative for CR, QR, IT, PE, PFCF and PB. In the latter case, the desired transformation is obtained by taking an inverse transformation. The results indicate that the estimated values of λ may vary substantially across countries in the case of ROI, ROE, OP, DE and EC. In the case of negative estimates the variation seems to be smaller and very often transformation determined by the data is close to the inverse of the square root or the inverse of the cubic root transformations. Generally, different transformations are needed for different financial ratios.[5]

The normality of financial ratios is examined using the Shapiro-Wilk (1965) test. The test has more power to detect non-normality than some alternative tests when the sample size is small (see Wilk et al., 1968). The results from the normality test are reported in Table 3. A small value of the test statistic indicates departures from normality. The results from the normality tests performed for the untransformed data are given in Panel A of Table 3. Statistically significant test statistics are in bold face. The results suggest rejection of normality of financial ratios at the 1% level in nearly all cases. Panel B of Table 3 presents the Shapiro-Wilk tests values for the transformed financial ratios. The results indicate that after the transformation frequency of rejection is substantially lower. The transformation seems to work especially well for CR and QR, moderately for OPM, DE, IT, PE, PFCF, and PB and poorly for ROI, ROE and EC. These findings are consistent across all the countries. In the case of Finland, Italy, Japan and Spain transformation substantially improves the normality of financial ratios, while in the case of Germany, Sweden and the U.K. the results are not so encouraging. Generally, the results from the Shapiro-Wilk tests suggest that the Box-Cox power transformation is useful when normalizing financial ratios in all the countries.

Table 2. Estimates of Lambda for Box-Cox Power Transformations.

Ratio	Finland	France	Germany	Italy	Japan	Netherlands	Spain	Sweden	U.K.	U.S.
ROI	0.87	1.59*	0.76	0.36*	1.31	0.93	0.40*	2.27*	1.16	2.08*
ROE	0.74	1.53*	1.26	0.71*	1.61*	0.70*	0.48*	1.83*	1.03	1.77*
OPM	1.03	1.79*	1.45	1.63*	0.29*	0.19*	0.50*	2.08*	1.87*	2.31*
DE	0.27*	0.24*	0.14*	0.20*	0.23*	0.39*	0.21*	0.19*	0.21*	0.23*
EC	1.75	1.33	1.75*	1.32	1.93*	1.23	0.77	1.93*	2.57*	1.70*
CR	−0.87*	−0.39*	−0.35*	−0.75*	−0.20*	−1.15*	−0.17*	−0.66*	−0.54*	−0.20*
QR	−0.71*	−0.26*	−0.15*	−0.77*	−0.28*	−0.62*	−0.57*	−0.54*	−0.29*	−0.12*
IT	−0.65*	−0.37*	−0.56*	−0.45*	−0.47*	−0.19*	−0.32*	−0.59*	−0.31*	−0.37*
PE	−0.18*	−0.33*	−0.47*	−0.27*	−0.10*	−0.68*	−0.49*	−0.30*	−0.36*	−0.39*
PFCF	−0.20*	−0.29*	−0.31*	−0.19*	−0.13*	−0.27*	−0.34*	−0.23*	−0.36*	−0.02*
PB	−0.28*	−0.32*	−0.35*	−0.56*	−0.24*	−0.30*	−0.40*	−0.31*	−0.36*	−0.07*

Note: Explanations of ratios are given in Table 1.

*Significantly different from one at the 1% level.

Table 3. Shapiro-Wilk Test Statistics for Normality of Ratios Before and After Box-Cox Power Transformation.

Ratio	Finland	France	Germany	Italy	Japan	Netherlands	Spain	Sweden	U.K.	U.S.
Panel A: Normality of sample										
ROI	0.94*	0.91*	0.97*	0.91*	0.96*	0.97*	0.93*	0.77*	0.95*	0.88*
ROE	0.95*	0.92*	0.96*	0.97*	0.91*	0.95*	0.95*	0.79*	0.97*	0.92*
OPM	0.97	0.93*	0.96*	0.94*	0.92*	0.75*	0.95	0.72*	0.79*	0.59*
DE	0.83*	0.84*	0.79*	0.76*	0.81*	0.91*	0.80*	0.82*	0.82*	0.83*
EC	0.94*	0.94*	0.89*	0.93*	0.92*	0.93*	0.97	0.89*	0.83*	0.88*
CR	0.81*	0.90*	0.84*	0.71*	0.90*	0.73*	0.80*	0.79*	0.64*	0.82*
QR	0.75*	0.88*	0.86*	0.54*	0.84*	0.77*	0.68*	0.75*	0.60*	0.79*
IT	0.62*	0.58*	0.63*	0.67*	0.69*	0.60*	0.63*	0.53*	0.57*	0.64*
PE	0.74*	0.74*	0.66*	0.68*	0.83*	0.56*	0.81*	0.63*	0.72*	0.77*
PFCF	0.76*	0.75*	0.63*	0.70*	0.81*	0.76*	0.53*	0.77*	0.67*	0.81*
PB	0.78*	0.76*	0.79*	0.76*	0.83*	0.80*	0.74*	0.81*	0.74*	0.80*
Panel B: Normality of transformed sample										
ROI	0.95*	0.96*	0.98*	0.97*	0.97*	0.97*	0.99	0.93*	0.95*	0.96*
ROE	0.96*	0.96*	0.97*	0.98	0.96*	0.96*	0.99	0.90*	0.97*	0.98*
OPM	0.97	0.97*	0.98*	0.98	0.99	0.89*	0.98	0.89*	0.88*	0.74*
DE	0.98	0.98	0.95*	0.98	0.99	0.95*	0.99	0.94*	0.95*	0.94*
EC	0.95*	0.94*	0.90*	0.93*	0.94*	0.93*	0.97	0.90*	0.86*	0.89*
CR	0.98	0.98*	0.99	0.99	0.99	0.98	0.97	0.99	0.99	0.99
QR	0.98	0.99	0.99	0.99	0.98	0.98	0.95	0.99	0.98*	0.99
IT	0.97	0.97*	0.97*	0.98	0.98*	0.99	0.97	0.96*	0.99	0.99
PE	0.99	0.98	0.98*	0.99	0.99	0.97*	0.99	0.98	0.98*	0.99
PFCF	0.99	0.97*	0.98*	0.99	0.99	0.99	0.97	0.96*	0.98*	0.99
PB	0.98	0.97*	0.98*	0.98	0.99	0.97*	0.99	0.97*	0.97*	0.99

Note: Explanations of ratios are given in Table 1.

*Significant at the 1% level.

Table 4. Skewness of Ratios Before and After Box-Cox Power Transformation.

Ratio	Finland	France	Germany	Italy	Japan	Netherlands	Spain	Sweden	U.K.	U.S.
Panel A: Skewness of sample										
ROI	0.59*	−1.04*	0.43*	1.14*	−0.44*	0.30	0.88*	−2.14*	−0.19	−1.37*
ROE	0.70*	−1.02*	−0.45*	0.55*	−1.05*	0.66*	0.96*	−2.34*	0.04	−1.06*
OPM	0.08	−1.08*	−0.56*	−0.91*	1.06*	1.77*	0.67*	−2.42*	−1.86*	−2.88*
DE	1.73*	1.34*	1.28*	1.69*	1.60*	1.01*	1.99*	1.43*	1.50*	1.37*
EC	−0.53	−0.30*	−0.66*	−0.46*	−0.73*	−0.28	0.03	−0.60*	−1.02*	−0.64*
CR	1.76*	1.00*	1.52*	2.89*	1.22*	2.07*	2.61*	1.97*	2.69*	1.76*
QR	2.13*	1.21*	1.44*	4.55*	1.58*	1.79*	3.55*	2.11*	2.81*	1.93*
IT	3.21*	2.73*	2.44*	2.43*	2.32*	3.72*	3.48*	3.25*	2.91*	2.66*
PE	2.53*	2.02*	2.37*	3.80*	1.62*	3.15*	1.73*	3.37*	2.14*	2.15*
PFCF	2.12*	1.85*	2.48*	2.75*	1.68*	2.27*	5.08*	1.88*	2.33*	1.95*
PB	1.73*	1.90*	1.67*	2.01*	1.60*	1.53*	2.35*	1.56*	1.99*	1.87*
Panel B: Skewness of transformed sample										
ROI	0.29	−0.07	0.08	0.07	0.05	0.15	−0.03	−0.41	−0.19	−0.17
ROE	0.17	−0.09	−0.01	0.06	−0.10	0.11	0.01	−1.10*	0.09	−0.22
OPM	0.13	0.01	0.04	−0.02	0.02	0.12	−0.04	−0.61*	−0.39*	−2.01*
DE	−0.10	−0.08	−0.10	−0.06	−0.05	−0.28	−0.02	−0.14	−0.13	−0.17
EC	−0.26	−0.18	−0.36*	−0.29	−0.26*	−0.19	−0.07	−0.30	−0.62*	−0.35*
CR	0.11	0.04	0.04	0.07	0.01	0.07	−0.02	0.06	0.05	0.02
QR	0.13	0.03	0.02	0.03	0.04	0.06	−0.01	0.06	0.01	0.02
IT	0.18	0.13	0.17	0.09	0.11	−0.01	0.06	0.23	0.08	0.07
PE	0.02	0.07	0.12	0.03	0.01	0.19	0.04	0.06	0.09	0.04
PFCF	0.03	0.08	0.08	0.02	0.01	0.03	0.00	0.08	0.11	0.00
PB	0.07	0.09	0.08	0.10	0.03	0.08	0.06	0.07	0.09	0.01

Note: Critical values are provided by Snedecor and Cochran (1989). Explanation of ratios are given in Table 1.

*Significantly different from zero at the 1% level.

Table 5. Kurtosis of Ratios Before and After Box-Cox Power Transformation.

Ratio	Finland	France	Germany	Italy	Japan	Netherlands	Spain	Sweden	U.K.	U.S.
Panel A: Excess kurtosis of sample										
ROI	2.43*	2.80*	0.35	1.27*	1.31*	1.67*	0.23	5.70*	1.63*	2.77*
ROE	1.43*	2.68*	1.27*	0.55	2.25*	0.84	1.50	8.39*	1.07*	1.38*
OPM	1.47*	4.34*	1.87*	3.26*	0.89*	2.36*	0.08	7.50*	6.12*	8.10*
DE	3.83*	1.06*	0.51	1.97*	2.11*	0.97	4.60*	1.41*	1.94*	1.27*
EC	−0.67*	−1.08*	−0.75*	−0.96*	−0.25*	−1.12*	−0.99*	−0.84*	−0.08	−0.82*
CR	3.19*	0.15	2.01*	11.07*	1.28*	3.92*	11.81*	4.05*	7.16*	3.31*
QR	4.89*	0.85*	1.89*	26.88*	2.56*	2.59*	18.54*	4.46*	7.62*	3.93*
IT	13.74*	7.56*	5.57*	5.95*	5.24*	18.06*	15.11*	11.15*	8.38*	7.49*
PE	8.39*	3.89*	5.52*	23.33*	2.38*	10.31*	2.75*	16.54*	4.42*	5.13*
PFCF	4.97*	2.88*	5.91*	9.98*	2.50*	6.02*	32.47*	3.67*	5.17*	4.62*
PB	2.90*	3.47*	2.18*	4.01*	2.34*	1.57*	6.49*	1.87*	3.79*	3.70*
Panel B: Excess kurtosis of transformed sample										
ROI	2.67*	0.84*	0.58	0.91	0.88*	1.67*	−0.21	1.59*	1.63*	0.66*
ROE	1.57*	0.99*	0.75*	0.56	0.85*	0.98	0.34	2.59*	1.03*	0.25
OPM	1.43*	0.93*	0.61	0.38	0.25	2.76*	−0.29	2.64*	2.56*	3.56*
DE	−0.64	−0.72*	−1.18*	−0.46	−0.41*	−0.85*	−0.11	−1.15*	−1.04*	−1.10*
EC	−1.04*	−1.20*	−1.27*	−1.14*	−1.05*	−1.23*	−0.94*	−1.31*	−1.00*	−1.27*
CR	−0.84*	−0.70*	−0.65*	−0.51	−0.28	−0.10	0.98	−0.49	−0.25*	−0.55*
QR	−0.86*	−0.53*	−0.65*	0.02	−0.74*	−0.45	−0.03	−0.43	0.07	−0.58*
IT	−0.89*	−0.66*	−0.94*	−0.57	−0.83*	0.29	−0.71	−0.84	−0.56*	−0.60*
PE	−0.38	−0.69*	−0.76*	−0.45	−0.39*	−0.93*	−0.37	−0.49	−0.86*	−0.43*
PFCF	−0.49	−0.92*	−0.67*	−0.24	−0.42*	−0.44	−0.03	−1.08*	−0.90*	−0.18
PB	−0.86*	−0.96*	−0.91*	−0.82*	−0.65*	−1.01*	−0.59	−0.93*	−0.95*	−0.51*

Note: Critical values are provided by Snedecor and Cochran (1989). Explanation of ratios are given in Table 1.

*Significantly different from zero at the 1% level.

To further examine whether the transformation can remove the skewness of the distribution of financial ratios, the significance of the skewness parameter in the untransformed and transformed samples are tested. Applying the critical values provided by Snedecor and Cochran (1989) is appropriate since the normal approximation does not work for small sample sizes. The results are reported in Table 4. The results before applying the transformation in Panel A show that distributions of DE, CR, QR, IT, PE, PFCF and PB are significantly skewed to the right. This finding is consistent across all the countries. By contrast, in the case of ROI, ROE and OPM the sign and significance of skewness vary without showing any consistent pattern. Also, EC behaves differently from the rest of the sample. It sometimes has a negative skewed distribution, whereas sometimes the normality is not rejected. Panel B of Table 4 provides the results regarding the transformed financial ratios. In general, the transformation removes the non-normality induced by skewness.

A similar analysis is performed for kurtosis in order to investigate whether the transformation can remove the excess kurtosis of the distribution of a financial ratio. The critical values corresponding to the 1% significant level for skewness are provided by Snedecor and Cochran (1989). The results regarding the statistical significance of excess kurtosis are presented in Table 5. The results for the untransformed data in Panel A suggest the rejection of excess kurtosis at the 1% significance level in most of the cases. Excess kurtosis is positive and significant for nearly all the ratios except for EC, for which it is significantly negative in eight cases out of eleven. The results regarding the transformed financial ratios are presented in Panel B of Table 5. They indicate that the degree of kurtosis is considerably smaller after the transformation. In the case of DE, CR, QR, IT, PE, PFCF and PB distribution has reversed from leptokurtic to platykurtic. Surprisingly, non-zero kurtosis is still statistically significant in several cases. This indicates that the non-normality of the transformed financial ratios is mainly due to kurtosis. The results do not indicate much variation in the performance of transformation across the countries.

SUMMARY AND CONCLUSIONS

This study investigates the distributional properties of financial ratios and the usefulness of the Box and Cox (1964) transformation in normalizing financial ratios in different accounting environments. Distributional properties of commonly used accrual-based financial ratios representing four key economic dimension of a firm and frequently used market-based financial ratios are analyzed in ten different countries. The countries are selected based on the classification system of financial

reporting practices by Nobes (1983, 1998) to represent all the different accounting environments.

The results show that the untransformed financial ratios are not normally distributed. Three types of financial ratio distributions can be identified. The first consists of the profitability ratios exhibiting positive kurtosis but no clear skewness pattern. The second group of ratios with lower bound exhibits clear positive skewness and kurtosis. The third group includes only the equity to total capital ratio with both lower and upper bounds exhibiting negative skewness and kurtosis.

The results suggest that non-normality can be reduced considerably by using the Box-Cox power transformation. The rejection frequency of the normality is substantially lower for the transformed ratios. The transformation works especially well for current ratio and quick ratio, poorly for return on investment, return on equity and equity to total capital and moderately for rest of the investigated ratios. These findings are consistent across all the countries. Regarding the third and fourth moments, the results indicate that the transformation completely removes the non-normality induced by skewness. However, even though the excess kurtosis is substantially smaller after the transformation, it still remains statistically significant in several cases.

The results of the paper have important implications. First, the Box-Cox power transformation can substantially improve the normality of financial ratios. For this reason, it should be applied when normality is required in the analysis. Second, the distributional properties and the usefulness of the transformation are not dependent on the accounting environment. However, some inconsistency occurs with the profitability ratios that are, at least to some extent, affected by the accounting practices. Therefore, researchers should focus on the selection of ratios on the basis of their properties rather than the accounting environment.

NOTES

1. See Nobes (1983), Weetman and Gray (1991), Doupnik and Salter (1993), Nobes (1998) and Nobes and Parker (2000) on the international classification of financial reporting practices.

2. Empirical evidence supports the existence of a_t (see Barnes, 1982 for a review).

3. Since $z_t^{(\lambda)} = \sum_{i=1}^{\infty} \lambda^{i-1} \log(z_t)^i / i!$ it follows that $z_t^{(0)} = \log(z_t)$.

4. Deakin (1976) found empirically that square root and logarithmic transformation leads to normality in some cases. For other possible pre-determined distributional transformations see Rummel (1970).

5. These results and others reported later in this section were also analyzed for the period 1996–1999. These results (available on request) were consistent with the results of the year 2000.

ACKNOWLEDGMENTS

The authors would like to thank an anonymous referee for helpful comments and Janne Äijö for providing research assistance.

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VALUE RELEVANCE OF OPERATING INCOME VERSUS NON-OPERATING INCOME IN THE TAIWAN STOCK EXCHANGE

Ben-Hsien Bao and Da-Hsien Bao

ABSTRACT

Taiwanese firms generally have a higher proportion of non-operating income than U.S. and U.K. firms. Taiwan also has many investors who focus only on short-term returns and ignore risks. It therefore is possible that non-operating income is at least as value relevant as operating income in the Taiwan Stock Exchange. Results show that valuation models based on earnings components have a higher explanatory power than those based solely on earnings. The contribution of non-operating income is not significantly different from that of operating income.

INTRODUCTION

Value relevance of accounting numbers has been the focus of accounting research for the past three decades. Results generally show that earnings (Ball & Brown, 1968; Beaver et al., 1979), cash flows (Bernard & Stober, 1989; Bowen et al., 1987; Livnat & Zarowin, 1990; Wilson, 1987), book value (Bernard, 1993; Burgstahler & Dichev, 1997), economic value added (Biddle et al., 1997), and

Advances in International Accounting
Advances in International Accounting, Volume 17, 103–117

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17006-2

residual earnings (Biddle et al., 1997; Myers, 1999) are value relevant. Earnings, however, are the most important determinant of firm value/return.

Prior research has also examined the value relevance of earnings components, defined either by accounting classification or by the permanent-transitory dichotomy.[1] Results show that the components of earnings, defined by accounting classification, have information content (Bowen, 1981; Daley, 1984; Fairfield et al., 1996; Lipe, 1986). Results also prove that the permanent component of earnings increases the persistence of earnings while the temporary component of earnings decreases the persistence of earnings, i.e. the incremental value-relevance of information other than permanent earnings is greater when earnings are predominantly transitory (Ali & Zarowin, 1992; Lie, 2001; Quirin & Allen, 2000). Revsine et al. (1999) claim that operating income is a recurring, sustainable component of earnings, and would fall into the permanent category. Income from sources other than operations is a non-recurring component of earnings, and would fall into the transitory category.

Research on value relevance of earnings components also relates to research on earnings quality (Bradshaw et al., 1999; Comiskey et al., 1994/1995; Mikhail et al., 1999). Earnings quality can be defined by earnings persistence, i.e. the higher the persistence of earnings is, the higher the quality of earnings is (Comiskey et al., 1994/1995). The earnings of a firm, therefore, have more quality if they are predominately permanent. Comiskey et al. (1994/1995) have suggested that: (1) a firm's earnings have high quality if the firm can sustain or increase its current earnings; (2) a firm's earnings strength is higher if current earnings have not been increased by non-operating (non-recurring) revenue/gain; and (3) a firm's earnings strength is higher if current earnings have been decreased by non-operating (non-recurring) expense/loss. Theoretically, a firm's earnings are more value relevant if they are predominately permanent, more persistent, mainly from operations, and have higher quality.

Results presented in prior research indicate that earnings and earnings components are useful for investors for valuation purposes in the U.S. Operating income has a higher earnings multiplier than non-operating income. The importance of earnings and earnings components, however, may be varied in other stock market, such as the Taiwan Stock Exchange, that has different institutional and investor characteristics. Previous value relevance empirical studies of the Taiwan Stock Exchange do present results that are similar to and different from those of the U.S. stock exchanges (Bao & Bao, 1998; Chen & Zhang, 1998; Chu, 1997). The applicability of the U.S. results, therefore, is an empirical question.

The purpose of this study is to investigate the value relevance of operating income vs. non-operating income in the Taiwan Stock Exchange. Value is measured by both return on equity and stock price. One of the institutional

characteristics of the Taiwan Stock Exchange is that many of the listed companies have a considerable proportion of non-operating income (Chu, 1997).[2,3] One of the individual investor characteristics is that investors always look at short-term returns and never think of the risk associated with the stocks (Flannery, 1991). Non-operating income, although transitory in nature, certainly can increase current earnings. It, therefore, is possible that non-operating income is as value relevant as operating income in the Taiwan Stock Exchange because: (1) it has a high proportion; and (2) its temporary nature is ignored by the investors.

Results of this study show that the power of explaining return on equity or stock price, measured by adjusted R^2, is consistently higher using both operating income and non-operating income than using earnings alone, i.e. earnings components have higher explanatory power. The contribution of operating income and the contribution of non-operating income, measured by coefficients of partial correlation, however, are not significantly different. The implication for analysts and investor is that when analyzing Taiwanese firm value, both operating income and non-operating income should be considered since: (1) they are statistically significant explanatory variables; (2) their explanatory power is not significantly different; and (3) their combined explanatory power is higher than earnings' explanatory power.

The next section of this study is a brief review of prior research on operating income vs. non-operating income. It is followed by selection of data, and analyses and results. Conclusions are given in the last section.

OPERATING INCOME VERSUS NON-OPERATING INCOME

Several prior studies have examined the value relevance of operating income and non-operating income. Fairfield et al. (1996) first disaggregate U.S. firms' earnings into ten components, then use the components to predict one-year-ahead return on equity, i.e. they study the predictive content of earnings components. Their dependent variable is one-year-ahead return on equity while their independent variables are the earnings components normalized by owners' equity. Results show that both operating income and non-operating income are statistically significant in the estimation models.

Bowen (1981) has examined the multiples placed on the components of earnings of U.S. electric utility firms. He specifically compares the multiplier of allowance for funds used during construction, a non-operating item, and the multiplier of operating income. The dependent variable is stock price while the independent variables are the earnings components. Both the dependent and

independent variables are normalized by beginning book value. Results show that the cross-sectional valuation model is improved by disaggregating earnings into their components, and the operating income component is more valuable per dollar than the allowance component, i.e. the operating income component has a higher earnings multiplier than the non-operating income component.

Strong and Walker (1993) have studied the information content of earnings components of U.K. firms. Earnings are divided into three components: ordinary earnings, exceptional earnings, and extraordinary items.[4] The dependent variable is either annual cumulative abnormal return or annual unadjusted return, and the independent variables are the earnings components. Results show that ordinary earnings are always statistically significant while exceptional earnings generally are not statistically significant.

The U.S. results indicate both operating income and non-operating income in general are significant explanatory variables, although operating income has a higher earnings multiplier. The U.K. results indicate ordinary earnings are a significant explanatory variable while exceptional earnings are not. The difference perhaps is caused by the differences in accounting classifications required in these two countries. For example, exceptional earnings in the U.K. are defined as earnings that are exceptional on account of size or incidence and are derived from the ordinary activities of the business (Strong & Walker, 1993). In addition, the relative size of the exceptional earnings (with respect to ordinary earnings) in the U.K. is much smaller than the relative size of non-operating income (with respect to operating income) in the U.S.[5] The applicability of the U.S. results, therefore, should be empirically tested.

DATA

Firms meeting the following criteria are selected for this study:

(1) Their 1991–1996 stockholders' equity data are available in the Pacific-Basin Capital Markets (PACAP) – Taiwan database;
(2) Their 1992–1997 after-tax income from operations, after-tax other revenue/expense, after-tax extraordinary gain/loss, net income, number of outstanding shares of common stock are available in the PACAP – Taiwan database; and
(3) Their 1992–1997 closing price per share data are available in the PACAP – Taiwan database.

The final sample consists of 144 firms.[6]

Table 1. Descriptive Statistics $n = 859$.

	Mean	Minimum	Maximum	Std. Dev.
OPONI	0.7502	−135.70	58.72	5.45
OTONI	0.2720	−57.72	136.70	5.43
EXONI	−0.0213	−19.83	1.77	0.70

Note: OPONI = after-tax income from operations divided by net income.
OTONI = after-tax other revenue/expense divided by net income.
EXONI = after-tax extraordinary gain/loss divided by net income.
n = number of firm-year observations.

Return on equity is calculated by dividing net income by stockholders' equity. Earnings per share, after-tax income from operations per share, after-tax other revenue/expense per share, and after-tax extraordinary gain/loss per share are obtained by dividing net income, after-tax income from operations, after-tax other revenue/expense, and after-tax extraordinary gain/loss by number of outstanding shares of common stock, respectively. Outliers are deleted using the Cook's distance criterion (Barth et al., 1999). After deleting the outliers, the sample has 859 firm-year observations.

Table 1 presents descriptive statistics of the 859 firm-year observations.[7] It shows that operating income of the Taiwanese firms on average is about 75% of net income while non-operating income of the Taiwanese firms on average is about 27% of net income, i.e. the proportion of non-operating income is higher than those of the U.S. and U.K. firms. The average extraordinary loss is about 2% of net income.

ANALYSES AND RESULTS

Three types of value relevance analyses are performed in this study. They are the return on equity analysis (Fairfield et al., 1996), the price levels analysis (Kothari, 1992), and the price changes analysis (Kothari, 1992), i.e. value can be defined by return on equity, stock price level, or stock price change.

Return on Equity Analysis

Return on equity analysis can be presented by the following equations:

$$\mathrm{ROE}_{i,t+1} = \alpha_1 + \beta_1 \mathrm{ROE}_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$\mathrm{ROE}_{i,t+1} = \alpha_2 + \beta_2 \mathrm{OPOSHE}_{i,t} + \beta_3 \mathrm{OTOSHE}_{i,t} + \beta_4 \mathrm{EXOSHE}_{i,t} + \varepsilon_{i,t} \quad (2)$$

where: $ROE_{i,t}$ is firm i's return on equity in year t, $OPOSHE_{i,t}$ is firm i's after-tax income from operations in year t normalized by stockholders' equity, $OTOSHE_{i,t}$ is firm i's after-tax other revenue/expense in year t normalized by stock-holders' equity, and $EXOSHE_{i,t}$ is firm i's after-tax extraordinary gain/loss in year t normalized by stockholders' equity.

Equation (1) states that return on equity is positively associated with one-year-ahead return on equity while Eq. (2) states that operating income, non-operating income, and extraordinary gain/loss are positively associated with one-year-ahead return on equity.

Both annual analyses and combined analysis are performed. The results are reported in Table 2. Return on equity is positively and significantly associated with one-year-ahead return on equity in each of the five years from 1992 to 1996, and in the combined analysis. Both operating income and non-operating income are positively and significantly associated with one-year-ahead return on equity in each of the five years from 1992 to 1996, and in the combined analysis. Extraordinary gain/loss is positive and significant in only one of the five years and is not significant in the combined analysis.

Table 2 also shows that the adjusted R^2 value of earnings component regressions, based on Eq. (2), is higher than that of earnings regressions, based on Eq. (1), in each of the five years and in the combined analysis. Earnings components, therefore, have a higher explanatory power than earnings alone, i.e. the adjusted R^2 value is 8% higher using the annual analysis, and is 16% higher using the combined analysis.

The comparison of earnings multiplier of operating income and that of non-operating income used by Bowen (1981), however, is not conclusive. Earnings multiplier of operating income is higher in four of the five years, but is lower in the combined analysis. The comparison of coefficients of partial correlation, therefore, is performed (Neter et al., 1996).[8] The coefficient of partial correlation is the square root of the coefficient of partial determination, and the latter measures the marginal contribution of one variable when all other variables are already included in the model. The results are presented in Table 3.

Table 3 shows that operating income is more value relevant in four of the five years, but is less value relevant in the combined analysis. The coefficient of partial correlation of operating income, however, is not significantly different from that of non-operating income. Results in Tables 2 and 3 indicate that operating income and non-operating income can better explain the variation in one-year-ahead return on equity than return on equity alone. The explanatory power of operating income, however, is not different from that of non-operating income.

Table 2. Association With One-Year Ahead Return on Equity.

Equation (1) $ROE_{i,t+1} = \alpha_1 + \beta_1 ROE_{i,t} + \varepsilon_{i,t}$

Year	*n*	Intercept	ROE	Adj. R^2
1992	143	0.01 (1.24)	0.76 (15.51)***	0.6277
1993	144	0.04 (4.68)***	0.68 (11.15)***	0.4632
1994	143	−0.00 (−0.10)	0.46 (3.83)***	0.0878
1995	142	−0.44 (−4.06)***	9.87 (15.06)***	0.6155
1996	143	0.04 (4.54)***	0.59 (4.54)***	0.2433
All	715	−0.18 (−5.74)***	3.97 (16.37)***	0.2722

Equation (2) $ROE_{i,t+1} = \alpha_2 + \beta_2 OPOSHE_{i,t} + \beta_3 OTOSHE_{i,t} + \beta_4 EXOSHE_{i,t} + \varepsilon_{i,t}$

Year	*n*	Intercept	OPOSHE	OTOSHE	EXOSHE	Adj. R^2
1992	143	0.01 (0.87)	0.78 (15.54)***	0.39 (2.53)**	1.24 (1.57)	0.6419
1993	144	0.04 (5.27)***	0.68 (11.15)***	0.40 (4.01)***	1.24 (2.78)***	0.4987
1994	143	−0.00 (−0.19)	0.64 (4.56)***	0.06 (0.30)	−0.53 (−0.17)	0.1113
1995	142	0.02 (0.19)	2.94 (3.49)***	14.54 (22.15)***	−14.09 (−0.84)	0.7868
1996	143	0.03 (3.22)***	0.95 (9.93)***	0.53 (4.57)***	−0.67 (−2.92)***	0.4040
All	715	−0.14 (−4.66)***	2.31 (8.96)***	7.52 (22.64)***	−0.01 (−0.00)	0.4294

Note: *t*-Statistics are in the parentheses. Dependent variable is one-year-ahead return on equity ($ROE_{i,t+1}$). ROE = return on equity, OPOSHE = after-tax income from operations normalized by stockholders' equity, OTOSHE = after-tax other revenue/expense normalized by stockholders' equity, EXOSHE = after-tax extraordinary gain/loss normalized by stockholders' equity. Mean R^2 for ROE regressions is 0.4075. Mean R^2 for earnings components regressions is 0.4885.

**Significant at $\alpha = 0.05$ level.

***Significant at $\alpha = 0.01$ level.

Price Levels Analysis

Price levels analysis can be presented by the following equations:

$$\frac{P_{i,t}}{P_{i,t-1}} = \alpha_3 + \beta_5 E_{i,t} + \varepsilon_{i,t} \tag{3}$$

$$\frac{P_{i,t}}{P_{i,t-1}} = \alpha_4 + \beta_6 \mathrm{OP}_{i,t} + \beta_7 \mathrm{OT}_{i,t} + \beta_8 \mathrm{EX}_{i,t} + \varepsilon_{i,t} \tag{4}$$

where $P_{i,t}$ is firm i's closing price per share in year t, $E_{i,t}$ is firm i's earnings per share in year t normalized by beginning price per share, $\mathrm{OP}_{i,t}$ is firm i's after-tax income from operations per share in year t normalized by beginning price per share, $\mathrm{OT}_{i,t}$ is firm i's after-tax other revenue/expense per share in year t normalized by beginning price per share, and $\mathrm{EX}_{i,t}$ is firm i's after-tax extraordinary gain/loss per share in year t normalized by beginning price per share.

Equation (3) states that earnings per share is positively associated with price level while Eq. (4) states that operating income per share, non-operating income per share, and extraordinary gain/loss per share are positively associated with price level.

Both annual analyses and combined analysis are performed. The results are reported in Table 4. Earnings per share is positively and significantly associated with price level in each of the five years from 1993 to 1997, and in the combined analysis. Operating income per share is also positively and significantly associated with price level in each of the five years from 1993 to 1997 and in the combined analysis. Non-operating income per share is positively and significantly

Table 3. Coefficients of Partial Correlation Based on Earnings Components Regressions.

Year	n	OPOSHE	OTOSHE	EXOSHE
1992	143	0.7968	0.2099	0.1324
1993	144	0.6857	0.3206	0.2290
1994	143	0.3606	0.0255	−0.0148
1995	142	0.2848	0.8834	−0.0715
1996	143	0.6441	0.3611	−0.2403
Mean*		0.5544	0.3601	0.0070
All	715	0.3186	0.6473	−0.0002

Note: OPOSHE = after-tax income from operations normalized by stockholders' equity, OTOSHE = after-tax other revenue/expense normalized by stockholders' equity, EXOSHE = after-tax extraordinary gain/loss normalized by stockholders' equity.

*Coefficients for OPOSHE and OTOSHE are not significantly different ($p = 0.40$).

Table 4. Association with Price Levels.

Equation (3) $P_{i,t}/P_{i,t-1} = \alpha_3 + \beta_5 E_{i,t} + \varepsilon_{i,t}$

Year	n	Intercept	E	Adj. R^2
1993	144	1.32 (37.54)***	1.64 (2.71)***	0.0424
1994	143	1.01 (28.71)***	1.75 (2.23)**	0.0271
1995	142	0.61 (53.07)***	1.60 (4.72)***	0.1312
1996	143	11.39 (34.79)***	24.92 (3.87)***	0.0895
1997	144	1.07 (14.47)***	28.00 (2.08)**	0.0228
All	716	2.94 (15.34)***	16.66 (3.72)***	0.0176

Equation (4) $P_{i,t}/P_{i,t-1} = \alpha_4 + \beta_6 \mathrm{OP}_{i,t} + \beta_7 \mathrm{OT}_{i,t} + \beta_8 \mathrm{EX}_{i,t} + \varepsilon_{i,t}$

Year	n	Intercept	OP	OT	EX	Adj. R^2
1993	144	1.31 (35.93)***	1.94 (2.56)**	1.96 (1.72)*	−2.19 (−0.81)	0.0427
1994	143	1.00 (27.67)***	2.29 (2.14)**	1.46 (1.20)	−23.85 (−1.92)*	0.0440
1995	142	0.62 (48.93)***	1.41 (3.72)***	2.14 (4.28)***	−2.64 (−0.28)	0.1326
1996	143	11.08 (34.19)***	23.52 (3.64)***	48.18 (5.92)***	−6.92 (−0.24)	0.1854
1997	144	0.99 (25.02)***	27.30 (2.62)***	38.62 (4.64)***	317.95 (17.78)***	0.7271
All	716	2.92 (15.34)***	9.64 (1.97)**	43.26 (6.74)***	−34.12 (−1.43)	0.0594

Note: t-Statistics are in the parentheses. Dependent variable is price per share normalized by beginning price per share ($P_{i,t}/P_{i,t-1}$). E = earnings per share normalized beginning price per share, OP = after-tax income from operations per share normalized by beginning price per share, OT = after-tax other revenue/expense per share normalized by beginning price per share, EX = after-tax extraordinary gain/loss per share normalized by beginning price per share. Mean R^2 for earnings regressions is 0.0626. Mean R^2 for earnings components regressions is 0.2264.

*Significant at $\alpha = 0.10$ level.

**Significant at $\alpha = 0.05$ level.

***Significant at $\alpha = 0.01$ level.

associated with price level in four of the five years from 1993 to 1997 and in the combined analysis. Extraordinary gain/loss per share is positive and significant in only one of the five years and is not significant in the combined analysis.

Table 4 also shows that the adjusted R^2 value of earnings component regressions, based on Eq. (4), is higher than that of earnings regressions, based on Eq. (3), in each of the five years and in the combined analysis. Earnings components, therefore, have a higher explanatory power than earnings alone, i.e. the adjusted R^2 value is 16% higher using the annual analysis, and is 4% higher using the combined analysis.

The comparison of earnings multiplier of operating income per share and that of non-operating income per share, however, is inconclusive. Earnings multiplier of operating income per share is higher in two of the five years, and is lower in the combined analysis. The comparison of coefficients of partial correlation, therefore, is performed and the results are presented in Table 5.

Table 5. Coefficients of Partial Correlation Based on Earnings Components Regressions.

Year	*n*	OP	OT	EX
1993	144	0.2116	0.1439	−0.0687
1994	143	0.1789	0.1010	−0.1609
1995	142	0.3017	0.3425	−0.0239
1996	143	0.2950	0.4487	−0.0205
1997	144	0.2166	0.3651	0.8326
Mean*		0.2408	0.2802	0.1117
All	716	0.0734	0.2448	−0.0536

Note: OP = after-tax income from operations per share normalized by beginning price per share, OT = after-tax other revenue/expense per share normalized by beginning price per share, EX = after-tax extraordinary gain/loss per share normalized by beginning price per share.

*Coefficients for OP and OT are not significantly different ($p = 0.47$).

Table 5 shows that operating income per share is more value relevant in two of the five years, and is less value relevant in the combined analysis. The coefficient of partial correlation of operating income per share, however, is not significantly different from that of non-operating income per share. Results in Tables 4 and 5 indicate that operating income per share and non-operating income per share can better explain the variation in price level than earnings per share alone. The explanatory power of operating income per share, however, is not significantly different from that of non-operating income per share.

Price Changes Analysis

Price changes analysis can be presented by the following equations:

$$\frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} = \alpha_5 + \beta_9 \mathrm{EC}_{i,t} + \varepsilon_{i,t} \tag{5}$$

$$\frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} = \alpha_6 + \beta_{10} \mathrm{OPC}_{i,t} + \beta_{11} \mathrm{OTC}_{i,t} + \beta_{12} \mathrm{EXC}_{i,t} + \varepsilon_{i,t} \tag{6}$$

where $P_{i,t}$ is firm i's closing price per share in year t, $\mathrm{EC_{i,t}}$ is firm i's change in earnings per share in year t normalized by beginning price per share, $\mathrm{OPC}_{i,t}$ is firm i's change in after-tax income from operations per share in year t normalized by beginning price per share, $\mathrm{OTC}_{i,t}$ is firm i's change in after-tax other revenue/expense per share in year t normalized by beginning price per share, and $\mathrm{EXC}_{i,t}$ is firm i's change in after-tax extraordinary gain/loss per share in year t normalized by beginning price per share.

Table 6. Association with Price Changes.

Equation (5) $P_{i,t} - P_{i,t-1}/P_{i,t-1} = \alpha_5 + \beta_9 \mathrm{EC}_{i,t} + \varepsilon_{i,t}$

Year	n	Intercept	EC	Adj. R^2
1993	144	0.36 (11.52)***	3.63 (5.00)***	0.1440
1994	143	−0.00 (−0.07)	5.32 (7.28)**	0.2683
1995	142	−0.36 (−31.58)***	1.01 (3.16)***	0.0597
1996	143	10.85 (44.26)***	42.07 (8.71)***	0.3454
1997	144	0.01 (0.30)	72.15 (17.05)**	0.6696
All	716	2.21 (12.81)***	22.14 (4.78)***	0.0296

Equation (6) $P_{i,t} - P_{i,t-1}/P_{i,t-1} = \alpha_6 + \beta_{10}\mathrm{OPC}_{i,t} + \beta_{11}\mathrm{OTC}_{i,t} + \beta_{12}\mathrm{EXC}_{i,t} + \varepsilon_{i,t}$

Year	n	Intercept	OPC	OTC	EXC	Adj. R^2
1993	144	0.37 (12.09)***	5.99 (6.14)**	2.28 (2.24)**	−1.73 (−0.75)	0.2066
1994	143	−0.00 (−0.08)	7.43 (7.60)***	2.98 (2.90)***	−8.68 (−0.56)	0.3083
1995	142	−0.36 (−30.28)***	1.47 (3.06)***	0.98 (2.30)**	−2.70 (−1.38)	0.0732
1996	143	10.95 (40.60)***	44.15 (7.79)***	40.67 (7.50)***	67.05 (2.56)**	0.3422
1997	144	0.02 (0.61)	50.26 (4.26)***	61.52 (8.35)***	109.27 (5.97)***	0.6774
All	716	−1.49 (−0.27)	2.03 (12.19)***	45.98 (8.59)***	−22.72 (−1.07)	0.1072

Note: t-Statistics are in the parentheses. Dependent variable is change in price per share normalized by beginning price per share ($P_{i,t} - P_{i,t-1}/P_{i,t-1}$). EC = change in earnings per share normalized by beginning price per share, OPC = change in after-tax income from operations per share normalized by beginning price per share, OTC = change in after-tax other revenue/expense per share normalized by beginning price per share, EXC = change in after-tax extraordinary gain/loss per share normalized by beginning price per share. Mean R^2 for earnings regressions is 0.2974. Mean R^2 for earnings components regressions is 0.3215.

**Significant at $\alpha = 0.05$ level.

***Significant at $\alpha = 0.01$ level.

Equation (5) states that change in earnings per share is positively associated with price change while Eq. (6) states that change in operating income per share, change in non-operating income per share, and change in extraordinary gain/loss per share are positively associated with price change.

Both annual analyses and combined analysis are performed. The results are reported in Table 6. Change in earnings per share is positively and significantly associated with price change in each of the five years from 1993 to 1997, and in the combined analysis. Change in operating income per share and change in non-operating income per share are also positively and significantly associated with price change in each of the five years from 1993 to 1997 and in the combined analysis. Change in extraordinary gain/loss per share is positive and significant in only one of the five years and is not significant in the combined analysis.

Table 6 also shows that the adjusted R^2 value of earnings component regressions, based on Eq. (6), is higher than that of earnings regressions, based on Eq. (5), in four

Table 7. Coefficients of Partial Correlation Based on Earnings Components Regressions.

Year	*n*	OPC	OTC	EXC
1993	144	0.4604	0.1861	−0.0636
1994	143	0.5419	0.2385	−0.0475
1995	142	0.2522	0.1924	−0.1164
1996	143	0.5514	0.5367	0.2124
1997	144	0.3385	0.5765	0.4506
Mean*		0.4289	0.3460	0.0871
All	716	0.2157	0.3064	−0.0400

Note: OPC = change in after-tax income from operations per share normalized by beginning price per share, OTC = change in after-tax other revenue/expense per share normalized by beginning price per share, EXC = change in after-tax extraordinary gain/loss per share normalized by beginning price per share.

*Coefficients for OPC and OTC are not significantly different ($p = 0.45$).

of the five years and in the combined analysis. Earnings components, therefore, have a higher explanatory power than earnings alone, i.e. the adjusted R^2 value is 3% higher using the annual analysis, and is 9% higher using the combined analysis.

The comparison of earnings multiplier of change in operating income per share and that of change in non-operating income per share, however, is not conclusive. Earnings multiplier of change in operating income per share is higher in three of the five years, but is lower in the combined analysis. The comparison of coefficients of partial correlation, therefore, is performed and the results are presented in Table 7.

Table 7 shows that change in operating income per share is more value relevant in four of the five years, but is less value relevant in the combined analysis. The coefficient of partial correlation of change in operating income per share, however, is not significantly different from that of change in non-operating income per share. Results in Tables 6 and 7 indicate that change in operating income per share and change in non-operating income per share can better explain the variation in price change than change in earnings per share alone. The explanatory power of change in operating income per share, however, is not significantly different from that of change in non-operating income per share.

CONCLUSIONS

Prior empirical research shows that earnings and earnings components are value relevant. Theoretically, earnings components, such as the ten components defined

by Fairfield et al. (1996), can be permanent or transitory in nature. The permanent components have higher persistence, higher earnings multiplier, better quality, and are more value relevant than the transitory components. Operating income falls into the permanent category while non-operating income falls into the transitory category (Revsine et al., 1999).

U.S. evidence shows that both operating income and non-operating income are significant explanatory variable of one-year-ahead return on equity (Fairfield et al., 1996). Operating income, however, has a higher earnings multiplier than non-operating income (Bowen, 1981). U.K. evidence shows that ordinary earnings are value relevant while exceptional earnings in general are not value relevant.

Taiwanese firms generally have a higher proportion of non-operating income than their U.S. and U.K. counterparts. Taiwan also has many individual investors who focus solely on short-term returns and ignore risks. Non-operating income, although transitory in nature, certainly can increase short-term earnings. It, therefore, is possible that Taiwanese firms' non-operating income is at least as value relevant as their operating income.

Results of this study show that valuation models based on earnings components have a higher explanatory power than those based on earnings alone. The contribution of operating income and the contribution of non-operating income, however, are not significantly different. Both operating income and non-operating income are value relevant. The implication is that, when analyzing firm value, analysts and investors in the Taiwan Stock Exchange should consider both operating income and non-operating income.

NOTES

1. Earnings components defined by accounting classification include gross margin, selling, general and administrative expenses, depreciation, interest expense, non-operating income, special items, income tax, discontinued operations, extraordinary items, and minority income (Fairfield, 1996). Earnings components defined by the permanent-transitory dichotomy are used to classify firms. For example, firms are first ranked by E/P ratio. Earnings of firms in the middle range are predominately permanent while earnings of firms on both ends are predominately transitory (Ali et al., 1992).

2. Other characteristics of the Taiwan Stock Exchange include no capital gain tax, upper price limit (generally 7%), etc. Most U.S. Generally Accepted Accounting Principles, however, are adopted in Taiwan in a short delay (Chu, 1997).

3. Taiwanese firms' after-tax non-operating income on average is about 27% of their net income (see Table 1). During the same time period, U.S. firms' before-tax non-operating income averages about 22.62% of their net income (based on 18,661 non-financial U.S. firm-year observations selected from the Research Insight database). The percentage for U.S. firms' after-tax non-operating income, therefore, should be even smaller.

4. Although not entirely the same, ordinary earnings are comparable to operating income while exceptional earnings are comparable to non-operating income. The definitions of ordinary earnings and exceptional earnings are in Strong and Walker (1993).

5. Table 2 of Strong and Walker (1993) indicates that ordinary earnings are about thirteen times of exceptional earnings in the U.K.

6. The numbers of listed firms in 1992, 1993, 1994, 1995, 1996, and 1997, according to the largest financial newspaper in Taiwan *Economic Daily*, are 312, 324, 335, 380, 413, and 476, respectively. This study, therefore, does not include many newly listed firms.

7. The PACAP – Taiwan database provides a condensed version of the income statement. Below gross margin in the income statements, there are before-tax income from operations, before-tax other revenue/expense, income taxes, after-tax extraordinary items, and net income.

8. Another possible approach for evaluating the contribution of operating income vs. the contribution of non-operating income is suggested by King and Langli (1998): the adjusted R^2 value of regressing firm value on both operating income and non-operating income minus the adjusted R^2 value of regressing firm value only on non-operating income measures the contribution of operating income. The adjusted R^2 value of regressing firm value on both operating income and non-operating income minus the adjusted R^2 value of regressing firm value only on operating income measures the contribution of non-operating income. This approach is not adopted since regressing firm value on operating income alone or on non-operating income alone generally generates insignificant results, i.e. operating income and non-operating income are only jointly significant explanatory variables.

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THE IMPACT OF U.S. REQUIREMENTS FOR AUDIT COMMITTEES ON THE STRUCTURE AND MEMBERSHIP OF NON-U.S. AUDIT COMMITTEES

Louis Braiotta Jr.

ABSTRACT

Many non-U.S. national stock exchanges have amended their listing standards to require audit committees during the last two decades, while U.S. national stock exchanges have recently amended their listing standards in response to recommendations made by the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (BRC). These new listing requirements for U.S. registrants (SEC Form 10-K filers) provide an opportunity to contrast and examine requirements for audit committee structure and membership of non-U.S. registrants (SEC Form 20-F filers). Recognizing that the International Accounting Standards Board has identified a "core" set of basic accounting standards in international filings accentuates the need to have uniform requirements for audit committees. This paper argues that requirements for audit committees should be consistent to improve financial reporting in a global securities marketplace. Results suggest that boards of directors and their audit committees of non-U.S. sample firms before the enactment of the U.S. requirements will need to exhibit greater alignment of their audit

Advances in International Accounting
Advances in International Accounting, Volume 17, 119–135

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17007-4

committee's structure and composition with the recent U.S. requirements for audit committees.

INTRODUCTION

In September 1998, the Blue Ribbon Committee (BRC) on Improving the Effectiveness of Corporate Audit Committees was formed by the New York Stock Exchange (NYSE) and the National Association of Securities Dealers (NASDAQ) in response to former Securities and Exchange Commission (SEC) Chairman Arthur Levitt's concern that the quality of corporate financial reporting in the United States is eroding. In February 1999, the BRC issued its report and recommendations to significantly improve the audit committee's oversight of the financial reporting process. The BRC's recommendations focused on five areas related to audit committees: independence, qualifications, charters, outside audit involvement, and reports. In December 1999, the SEC, the national stock exchanges, and the Auditing Standards Board issued new rules largely based on the recommendations of the BRC.[1]

Given these new SEC requirements, the issue is whether these initiatives provide incentives to boards of directors and their audit committees of non-U.S. firms (SEC Form 20-F filers) to benchmark and align their audit committee structure and membership with the recent U.S. requirements.

Although U.S. stock exchanges do not subject foreign issuers to the rules with regard to audit committees, such firms (20-F filers) must comply with their home country laws and the rules of the principal non-U.S. securities market for their stock. Recognizing the evolution and convergence of both international accounting and auditing standards and the movement toward global rules for increasingly global capital markets, it is reasonable to expect that non-U.S. firms will align their requirements for audit committees toward U.S. standards for audit committees.

This study examines audit committee structure and composition based on disclosures provided in the 1998 SEC Form 20-Fs of a sample of 52 non-U.S. manufacturing firms. Because of recent initiatives to develop harmonized international accounting and auditing standards, and the movement toward globalization of capital markets, this paper argues that enhanced oversight responsibility for financial reporting in U.S. capital markets could improve oversight in non-U.S. capital markets with audit committees, i.e. non-U.S. registrants may adopt requirements similar to those in the U.S. when such requirements help to achieve uniformity in oversight protection to investors.

More recently, the International Auditing Practices Committee (1998) recognized "the auditor's responsibility to communicate matters of corporate

governance interest, arising from the audit of financial statements, to those charged with governance of an entity." The Committee (1998) notes that: "It is becoming an increasing practice to form audit committees of the board to assist in the governance responsibilities with respect to financial reporting." Similarly, the Public Oversight Board has endorsed a corporate governance approach to the audit process to enable boards of directors and their audit committees to be better informed about the quality of financial reporting (Kirk, 1996). The BRC (1999) recommends that the listing rules for both the New York Stock Exchange and the National Association of Securities Dealers require that "the audit committee charter for every company specify that the outside auditor is ultimately accountable to the board of directors and the audit committee, as representatives of shareholders."

This study focuses on whether these new requirements influence audit committees of non-U.S. manufacturing firms. It is important because investors should be afforded equal oversight protection with respect to a reliable financial reporting system and an efficient global securities marketplace. Indeed, boards of directors through their audit committees (non-executive directors) can more effectively discharge their financial and fiduciary responsibility to shareholders. Powell et al. (1992) point out:

> As the worldwide financial market expands and more companies cross national borders to become listed on major stock exchanges, major markets will seek consistent reporting requirements, and audit committee requirements may tend to become more consistent across individual markets.

In their cross-cultural study of international professionalism in the practice of internal auditing by members of the Institute of Internal Auditors, Powell et al. (1992) also found wide adherence to the Internal Auditing Standards promulgated by the Institute. Additionally, the International Task Force on Corporate Governance (1995) concluded:

> Given the development of the global market, the inevitable expansion of screen-based information and growth of cross-border investment activity, corporate behavior is coming under the scrutiny of an increasingly large number of interested parties. We can discern from our research that the practice of other jurisdictions has clearly brought about a natural process of convergence. Examples include: (1) the development of audit committees, firstly in the USA and Canada and now commonplace in the U.K., and being considered in Germany.

LITERATURE REVIEW

Many researchers (Bradbury, 1990; Collier, 1993; Collier & Gregory, 1999; Eichenseher & Shields, 1985; Menon & Williams, 1994; Pincus et al., 1989; Wild,

1996) have examined empirically the major determinants of audit committee formation: firm size, composition of the board of directors, size of the board of directors, management ownership of stock, and auditor-type. In an agency theory context, Pincus et al. (1989) provide empirical evidence that situations of high agency costs were significant factors in the creation of audit committees. They concluded that the presence of audit committees: "enhance the quality of information flows between principal and agent" (Pincus, 1989). Similarly, in the United Kingdom, Collier (1993) concluded: ". . . a number of shareholders support the contention that the incentives to form an audit committee increases in line with potential agency cost of equity." However, Bradbury (1990) suggests that the number of directors is a more important determinant of voluntary audit committees. Menon and Williams (1994) find that reliance on audit committees is related to board of directors' composition and that: "The higher the proportion of outside directors, the more likely it is that the AC (audit committee) will exclude officers of the company."

Recent research suggests that audit committees provide meaningful oversight of the financial reporting and audit processes. For example, Wild (1996) finds a significant increase in the capital market participant's reaction to earnings reports subsequent to the formation of audit committees. Wild argues that the effectiveness of the audit committee is a determinant of the quality and information of the firm's earnings report. Moreover, Collier and Gregory (1999) find evidence that reliance on audit committees by U.K. firms depends on the composition of the board of directors, while audit committee activity is associated with firm size. They conclude that U.K. firms do rely on audit committees. Although these studies examined audit committees within a country, Braiotta (1998) investigated the market capitalization of the stock exchange(s) with and without audit committees in 25 countries and concluded that: "the empirical evidence suggests that oversight protection is more likely driven by the effects of increases in total market capitalization (size)."

A summary of the requirements and/or recommendations for audit committees of companies listed on stock exchanges in various countries is contained in the Appendix.

Notwithstanding the stream of research with regard to audit committees in an agency theory framework, a second stream of theoretical legal research suggests that the concept and practices of such committees improves corporate governance (American Bar Association, 1984; American Law Institute, 1994; Braiotta, 1992; Sommer, 1978). Most of this research has recognized audit committees as a viable mechanism through which boards of directors can effectively discharge their fiduciary responsibilities to the stockholders. Likewise, the fiduciary responsibility

of boards in other countries has been definitively established and universally accepted (Fogarty, 1965). Thus, the board's stewardship accountability to the stockholders serves as a normative model of corporate oversight protection for the investing public.

In this study, two primary factors affecting the audit committee's monitoring effectiveness are examined: structure (independence) and composition. Recent research suggests that independence and composition of audit committees may be linked to both the quality of reporting and audit processes. Menon and Williams (1994) argue that:

> . . . the independence and integrity of monitoring may be enhanced by having internal and external auditors report to a subset of the boards which consists of outside directors. The full board of directors includes the CEO and other officers of the company, whose performance may be questioned by the auditors.

Independence of Audit Committee Members

As noted earlier, a number of public and private sector initiatives have accentuated the need to have audit committees comprised of independent directors. Vicknair et al. (1993) argue that: "Ideally, audit committees should be independent of management, allowing internal and external auditors to remain free of undue influence and interference by corporate insiders." A number of researchers have suggested that a higher proportion of independent outside directors on the board of directors increases the board's monitoring effectiveness (Baysinger & Butler, 1985; Beasley, 1996; Byrd & Hickman, 1992; Weisbach, 1988). In these studies, researchers provide evidence that as the level of the board's independence increases, the firm's corporate monitoring effectiveness improves and reduces the likelihood of financial statement fraud.

In an effort to narrowly define independence, the BRC (1999) concluded that: "Members of the audit committee shall be considered independent if they have no relationship to the corporation that may interfere with the exercise of their independence from management and the corporation." In contrast to the NYSE's earlier definition requiring that the audit committee be "comprised solely of directors independent of management and free from any relationship that, in the opinion of its Board of Directors, would interfere with the exercise of independent judgment as a committee member" (NYSE, 1983), the BRC (1999) indicated that examples of such relationships include:

- a director being employed by the corporation or any of its affiliates for the current year or any of the past five years;

- a director accepting any compensation from the corporation or any of its affiliates other than compensation for board service or benefits under a tax-qualified retirement plan;
- a director being a member of the immediate family of an individual who is, or has been in any of the past five years, employed by the corporation or any of its affiliates as an executive officer;
- a director being a partner in, or a controlling shareholder or an executive officer of, any for-profit business organization to which the corporation made, or from which the corporation received, payments that are or have been significant to the corporation or business organization in any of the past five years;
- a director being employed as an executive of another company where any of the corporation's executives serves on that company's compensation committee.[2]

The BRC noted that in certain cases, these restrictions may be subject to board override for one audit committee member, a so-called "grey" director. The BRC stated that:

> A director who has one or more of these relationships may be appointed to the audit committee, if the board, under exceptional and limited circumstances, determines that membership on the committee by the individual is required by the best interests of the corporation and its shareholder, and the board discloses, in the next annual proxy statement subsequent to such determination, the nature of the relationship and the reasons for that determination.

While the national stock exchanges (AMEX, 1993; NASDAQ, 1987; and NYSE, 1983) provide guidelines on composition of audit committees, such guidelines are broadly written because boards have discretion in appointing "grey" area directors to the audit committee. Vicknair et al. (1993) examined the proxy statements of 100 NYSE firms and found evidence of the following:

(1) membership of "grey" area directors on audit committees is pervasive;
(2) approximately three quarters (74%) of audit committees in our overall sample included at least one member would could be classified as a "grey" area director;
(3) approximately one-third (32%) of the 418 audit committee members in our sample could be classified as "grey" area directors.

Qualification and Composition of Audit Committees

The general consensus regarding the appropriate size of audit committees is three to five members. The American Institute of Certified Public Accountants (1978) found that:

> A survey of corporations with audit committees revealed that nearly 90% had audit committees of three to five members. In general, the audit committee should be large enough to have members with a good mix of business and experience, but not so large as to be unwieldy.

In contrast, Bacon (1988) reported the median sizes are four members for manufacturing and nonfinancial service companies and four and half for financial firms.

The number of members will vary from firm to firm because the size of the committee depends not only on the committee's responsibility and authority but also the size of both the board of directors and the firm. As noted previously, Menon and Williams (1994) present evidence that: "as the proportion of outside directors on the board increases, firms seem more likely to exclude officers from AC's (audit committees), and AC's are more active."

The BRC (1999) recommended that:

> . . . the NYSE and the NASD require listed companies to have an audit committee comprised of a minimum of three directors, each of whom is financially literate or becomes financially literate within a reasonable period of time after his or her appointment to the audit committee, and further that at least one member of the audit committee have accounting or related financial management expertise.

To the extent that independence and the composition of the audit committee enhance oversight responsibility for financial reporting in a global securities marketplace, agency costs will decrease because of the enhanced monitoring effectiveness (Jensen & Meckling, 1976). Watts (1977) and Leftwich et al. (1981) present evidence that the quality of external reporting and related auditing process can reduce agency costs. Thus, audit committees of firms in non-U.S. capital markets stand to gain from increased transparency in their firms and reduced litigation risk. Ceteris paribus, these arguments suggest that audit committees of non-U.S. firms will need to exhibit greater alignment with the recent U.S. requirements for audit committees to achieve uniformity in oversight protection for the international investing public.

DEVELOPMENT OF BENCHMARK SCORES

As noted previously, the BRC provides recommendations with respect to audit committee structure (independence) as well as qualifications and composition of the audit committee and the board of directors. Based on the BRC's recommendations, benchmark scores (BSCORES) were developed to assess the extent to which the structure and composition of audit committees in non-U.S. firms align with the new audit committee requirements for U.S. firms.[3] BSCORES were

developed for two categories, the composition of the audit committee and the qualifications of the members of the audit committee. Each of these categories was divided into the following elements:

(1) composition of the audit committee
   (a) the number of independent directors on the audit committee,
   (b) the number of "grey" directors on the audit committee,
(2) qualifications of members of the audit committee
   (a) the number of financially literate members of the audit committee,
   (b) the number of audit committee members with accounting or related financial expertise.

Each of the four elements was assigned a minimum value to be used as a benchmark for determining how closely audit committees of non-U.S. firms align with the new audit committee requirements for U.S. firms. The BSCORES for the above categories were based on the following BRC recommendations:

(1) composition of the audit committee
   (a) As noted previously, the BRC recommended that publicly held companies have an audit committee comprised of a minimum of three independent directors. Thus, the benchmark for the number of independent directors on the audit committee element was assigned a value of three points.
   (b) In accordance with the BRC's board override provision, the element for the number of "grey" directors was assigned a benchmark value of one point.
(2) qualifications of members of the audit committee
   (a) The BRC recommended that each member of an audit committee be financially literate. Accordingly, the element for the number of financially literate members of the audit committee was assigned a benchmark value of three points.
   (b) The BRC also recommended that least one member of the audit committee have accounting or related financial management expertise. Thus, the

Table 1. Summary of Benchmark BSCORES.

Categories and Elements of BSCORES	Benchmark BSCORES
Composition of audit committee	
1. Number of independent audit committee members	3
2. Number of "grey" audit committee members	1
Qualifications of members of audit committee	
1. Number of financially literate audit committee members	3
2. Number of audit committee members with accounting or related financial management expertise	1

element for the number of audit committee members with accounting or related financial expertise assigned a benchmark value of three points.

Table 1 summarizes the BSCORES for each of these elements.

CALCULATION OF FIRM SCORES

To compare the composition and qualifications of members of the audit committee of individual non-U.S. firms with the benchmarks established above, firm scores (FSCORES) were calculated for sample non-U.S. firms for each of the four elements discussed above: the number of independent board members on the audit committee, the number of "grey" members of the board of directors on the audit committee, the number of audit committee members who are financially literate, and the number of audit committee members with accounting or financial management expertise.

An initial sample of 127 non-U.S. manufacturing firms (SEC Form 20-F filers) was selected from Disclosure's Global Access database for fiscal year ended December 31, 1998. To determine the characteristics of audit committees, firms were required to have available data on the audit committee for the test period, resulting in a final sample of 52 non-U.S. manufacturing firms. The sample contains a wide range of firm size with book value of assets of $101.5 million at the twenty-fifth percentile compared to $5.1 billion at the seventy-fifth percentile of the distribution. Thus, the range associated with book value of assets reveals substantial cross-sectional variation in firm size.

Firms in the manufacturing industry were selected because the number of firms with SIC codes 3000–3999 had the highest concentration across countries. Fiscal year 1998 was selected because of the gravity toward a global securities marketplace (International Federation of Accountants, 1995) along with access to recent available data. One year was chosen because audit committee disclosures were relatively constant over time.

Table 2 lists the 52 non-U.S. manufacturing firms included in the study and particular characteristics of their audit committees and boards of directors.

RESULTS

Mean were calculated for each of the four elements based on the individual FSCORES for the 52 sample non-U.S. manufacturing firms. The results of the *t*-values for the differences between the BSCORES and FSCORES are presented in Table 3.

Table 2. Selected Characteristics of Audit Committees and Boards of Directors of 52 Non-U.S. Manufacturing Firms.

Country	Firm	U.S. Stock Exchange	Audit Committee			Board of Directors		
			Number of Members	% Independent Directors	Number Financial Knowledge	Number of Members	No. of Outside Directors	% of Outside Directors
Australia	Pacific Dunlop	NASDAQ	3	100	2	11	7	64
Canada	Acetex	NASDAQ	3	67	–	5	3	60
	Agrium	NYSE	2	100	–	6	5	83
	AT Plastics	AMEX	3	67	–	8	6	75
	Biovail Int'l	NYSE	3	67	2	8	3	38
	Biochem Pharma	NYSE	4	75	–	12	8	67
	DG Jewellery of Canada	NASDAQ	2	0	–	5	4	80
	Domtar	NYSE	4	75	2	16	14	88
	Fantorn Technologies	NASDAQ	4	100	–	7	5	71
	Genesis Microchip	NASDAQ	3	100	3	7	5	71
	IPSCO	NYSE	6	100	–	13	12	92
	MacMillan Bloedel	NASDAQ	6	83	–	15	12	80
	Magna Int'l	NYSE	3	67	–	11	9	81
	Motorola	NYSE	2	100	–	8	7	88
	National Healthcare Mfg.	NASDAQ	4	25	1	8	4	50
	Petro Canada	NYSE	4	100	1	11	10	91
	Premdor	NYSE	4	100	1	9	7	78
	Quebecor	NASDAQ	3	67	1	8	4	50
	Royal Corp. Tech	NYSE	3	67	1	8	3	38
	Spectrum Signal	NASDAQ	3	67	–	7	5	71
	Suncor Energy	NYSE	5	80	1	13	12	92
	Western Star Trucking	AMEX	3	100	–	9	4	44
France	ELF Aquitaine	NYSE	3	67	–	12	11	92
	Genset SA	NASDAQ	2	100	–	8	4	50
	Pechinery	NYSE	3	100	–	15	10	67
Hong Kong	Zindart	NASDAQ	3	67	2	8	5	63

Israel	Elscint	NYSE	3	100	–	9	7	78
	ETZ Lavud	AMEX	3	100	–	10	5	50
	Galileo Tech.	NASDAQ	2	100	1	4	2	50
	HS Intelligence Info Systems	NASDAQ	3	100	–	4	2	50
Israel	Laser Industries	NASDAQ	3	100	2	7	5	71
	Nur Microprinters	NASDAQ	3	100	1	6	3	50
	Orbotech	NASDAQ	3	100	1	8	4	50
	Scitex	NASDAQ	3	67	NA	12	8	67
Netherlands	Ansalso Signal	NASDAQ	3	100	1	9	9	100
	Elsag Bailey Process	NYSE	1	100	–	7	6	86
	Elsevier NV	NYSE	3	100	NA	11	6	54
	Philips Electronics	NYSE	3	67	1	8	8	100
	ST Microelectronics	NYSE	3	100	NA	8	6	75
Singapore	Asia Pulp and Paper	NYSE	3	0	1	6	1	17
	China Yuchai Int'l	NYSE	4	75	NA	10	8	80
United Kingdom	Astra Zeneca	NYSE	6	100	NA	7	6	86
	British Petroleum	NYSE	6	100	1	22	12	55
	Denison Int'l	NYSE	2	100	NA	6	3	50
	Gallaher	NYSE	3	100	1	11	6	45
	Glaxo Wellcome	NYSE	3	100	NA	14	8	57
	Hanson plc	NYSE	3	100	NA	11	6	54
	Imperial Chemical	NYSE	3	100	NA	12	6	50
	Lucasvarsity	NASDAQ	6	67	1	11	6	55
	Nycomed Amersham	NYSE	5	80	NA	13	9	69
	Reed Int'l	NYSE	5	100	NA	10	5	50
	Skyo Pharma	NYSE	3	100	NA	11	7	64
Average			3.4	85	1.3	9.5	6.4	67

Note: NA = data not available.

Table 3. Comparison of Benchmark Scores (BSCORES) and Firm Scores (FSCORES) of 52 Non-U.S. Manufacturing Firms.

Categories and Elements of BSCORE	Benchmark BSCORES	FSCORES		
		Mean	Std. Dev.	*t*-Value
Panel A: Audit committee composition				
1. Number of independent audit committee members	3	2.5962	0.7211	−4.039**
2. Number of "grey" audit committee members	1	0.1538	0.3643	−16.748**
Panel B: Audit committee qualifications				
1. Number of financially literate audit committee members	3	3.2692	0.9924	1.956
2. Number of audit committee members with accounting or related financial management expertise	1	0.3750	0.4804	−9.381**

Note: Equal variances assumed.
** Significant at 0.01 level.

Panel A of Table 3 shows that the differences in the mean values of the elements for the audit committee composition category are statistically significant at the 0.01 level. Significant differences are reported between BSCORES and FSCORES for the number of independent audit committee members and the number of "grey" area audit committee members. These results suggest that the composition of the audit committees of the sample non-U.S. manufacturing firms is not closely aligned with the new requirements of the BRC for U.S. firms.

Panel B reveals a significant difference at the 0.01 level between the BSCORES and FSCORES for the number of audit committee members with accounting or related financial management expertise. However, the difference between the mean score for the number of financially literate audit committee members is not statistically significant. Based on previous evidence presented by Menon and Williams (1994), these results suggest that the level of accounting expertise is more likely to increase for non-U.S. manufacturing firms.

CONCLUSIONS

This study investigates whether the U.S. requirements for audit committee structure and composition provide incentives for non-U.S. manufacturing sample firms to align their current practices with U.S. requirements. The evidence

suggests that non-U.S. sample firms will need to exhibit greater alignment of their audit committee composition and audit committee qualifications with U.S. requirements for audit committees in the future. One limitation of this study was to examine the degree of alignment of the sample firms' audit committees before the recent SEC requirements. Alternatively, another study may examine these SEC requirements after the test period to determine the degree of alignment with U.S. requirements. Nevertheless, the results suggest that the degree of alignment of audit committees and their need to change oversight responsibility for financial reporting in non-U.S. capital markets help provide consistent audit committee requirements across individual financial markets.

NOTES

1. The SEC Release stipulates that the disclosure requirements will not become effective until after December 15, 2000 for the year 2001 proxy season.
2. The BRC recommended the past five years, while the final rules contain the past three years.
3. See Marston and Strives (1991) for the use of disclosure indices in accounting research.

ACKNOWLEDGMENTS

I want to thank the conference participants at the 2001 Annual AAA Northeast Meeting and the 2002 Annual Meeting of the Niagara University Center for International Accounting Education and Research and the China Accounting and Finance Research Center of Hong Kong as well as the anonymous reviewers for their helpful comments in revising the paper.

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APPENDIX

Summary of Requirements and/or Recommendations for Audit Committees of Companies listed on Stock Exchanges for Various Countries

Country	Reference
Australia	Working Group on Corporate Practices and Conduct (Borsch Committee), *Corporate Practices and Conduct*, 1990.
Canada	The Bank Act; The Trust and Loan Companies Act, and the Insurance Company Act, 1992, Canadian Business Corporation Act 1975, Commission to Study the Public's Expectations of Audits (MacDonald Commission) 1988, Canadian Securities Administrators Notice on Audit Committees 1990, *Auditing and Related Service Guidelines*, "Commission with Audit Committees," 1991.
France	1995 Vienot Report on Corporate Governance.
Hong Kong	Hong Kong Society of CPAs and The Stock Exchange of Hong Kong, Amendments to Appendix 14 of its Listing Rules, May 1998.
India	Confederation of Indian Industry, Desirable Corporate Governance in India, A Code, Recommendation No. 8, 1997.
Israel	Israeli Companies Ordinance (New Version) 5743–1983, Section 96–15.
Malaysia	Kuala Lumpur Stock Exchange 1995 and Companies Act 1995.
Netherlands	1995 Peters Report on Corporate Governance.
New Zealand	Institute of Directors' 1992 *Draft Code of Practice for Boards of Directors*.
Saudi Arabia	Ministry of Commerce (for joint stock companies) regulations 1994.
Singapore	Companies Act of 1989.
South Africa	Johannesburg Stock Exchange *Listed Companies Manual*, 1989: King Committee Report on Corporate Governance, Code of Corporate Practices and Conduct, 1994.

APPENDIX (*Continued*)

Thailand	Stock Exchange of Thailand 1999.
United Kingdom	Recommendations of a Working Party Established by the Institute of Chartered Accountants of Scotland, *Corporate Governance-Directors' Responsibilities for Financial Statements*, 1992; The Committee on the Financial Aspects of Corporate Governance, *The Code of Best Practice* (Cadbury Committee) 1992; *Statement of Auditing Standards 610*, "Reports to Directors of Management," 1995. Committee on Corporate Governance, *The Combined Code: Principles of Good Governance and Code of Best Practice*, 1998.
United States	American Law Institute, *Principles of Corporate Governance: Analysis and Recommendation*, 1994. *American Stock Exchange Guide*, Vol. 2, Sec. 121, 1993. Connecticut General Statutes, Sec. 33–318 (b) (1) and (b) (2). *Statement on Auditing Standards No. 61*, "Communication with Audit Committees," 1988; *Statement on Auditing Standards*, No. 90, "Audit Committee Communications," 1999; *COSO Report*-"Internal Control-Integrated Framework" 1992. National Association of Securities Dealers, NASD *Manual*, Part III, Section (d) of Schedule D of the NASD bylaws, 1987; *New York Stock Exchange Listed Company*, 1993; Public Oversight Board, *A Special Report by the Public Oversight Board of the SEC Practice Section*, AICPA, 1993; *Report of the National Commission on Fraudulent Financial Reporting* (Treadway Commission) 1987. *Statement on Internal Auditing Standards No. 7*, "Communication with the Board of Directors" 1989; U.S. Federal Sentencing Commission, *Federal Sentencing Guidelines for Organizations*, 1991; Report and Recommendations of the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees, 1999; and the SEC finalized rules, (SEC Release Nos. NYSE34–42233; NASD 34–42231; and AMEX 34–42232. Report of the NACD Blue Ribbon Commission on Audit Committees, 1999.

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CULTURAL DIFFERENCES IN MANAGERS' PROPENSITY TO CREATE SLACK

Chong M. Lau and Ian R. C. Eggleton

ABSTRACT

This study examines the impact of national culture on budgetary slack. Prior studies have suggested a significant three-way interaction among budgetary participation*, performance evaluative style and information asymmetry affecting budgetary slack. As national culture may influence budgetary participation, this study hypothesizes that* national culture *may interact with performance evaluative style and information asymmetry to affect slack. The effects of the cultural dimensions of power distance and individualism provide the theoretical justification for hypothesizing a difference in the extent of budgetary participation between Australia and Singapore. The results support: (i) a significant relationship between national culture and budgetary participation; and (ii) a significant three-way interaction among* national culture*, performance evaluative style and information asymmetry affecting budgetary slack. These results may have important implications for multinational corporations in the management of budgetary slack across cultures.*

Advances in International Accounting
Advances in International Accounting, Volume 17, 137–174

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17008-6

INTRODUCTION

This study examines the role of national culture on managers' (subordinates') propensity to create slack. This issue is important because of the importance attached to the possible impact of national culture on control systems. Numerous management accounting researchers (e.g. Brownell, 1982a; Brownell & Hirst, 1986; Carr & Tomkins, 1998; Child, 1981; Chow et al., 1991; Frucot & Shearon, 1991; Harrison, 1992; Hofstede, 1980; Lau et al., 1995; O'Connor, 1995; Otley, 1978) have suggested that national culture could influence the transferability of management control systems across national boundaries because the effectiveness of these control systems could be affected by the presence of certain cultural dimensions (e.g. power distance and individualism), which could exist in some societies, but not in other societies.

The impact of national culture on the subordinates' propensity to create slack has generally been overlooked even though the importance attached to the impact of national culture on slack creation had long been acknowledged by accounting researchers. For instance, as early as the 1970s, Otley (1978) had regarded the study of budgetary slack creation by subordinates to be incomplete without the inclusion of the impact of national culture, which he considered as crucial. He argued that whether subordinates would use the budgetary process to further personal objectives at the expense of organizational objectives is ultimately "linked to the prevailing norms and values – both those internal to the organization *and those more generally held in the society at large*" (Otley, 1978, p. 145) (italics added). He concluded that it is therefore crucial that further research on the dysfunctional behavior associated with the budgetary process "*must* pay attention to the cultural norms and values that underpin the operation of control systems" (italics added). Yet, despite this early recognition of the important influence of national culture on budgetary slack creation, there has been a dearth of systematic cross-cultural research in this research area. Hence, a study on these issues may provide important evidence to assist in the advancement of the theories on slack creation, and the management of slack in organizations operating in different cultures.

The literature indicates that budgetary participation, budget emphasis and information asymmetry are three of the most important variables that are likely to affect propensity to create slack (Govindarajan, 1986; Merchant, 1985; Onsi, 1973; Young, 1985). There have also been suggestions that each of these variables, by itself, is not likely to affect slack (Dunk, 1993). Instead, these three variables are likely to have *joint* effects on slack. In other words, all these three variables need to be present before their effects on slack can be predicted. Following this line of argument, it is not likely that the effect of national culture on slack can be predicted if national culture alone is included in the model. Instead, just as

the effect of budgetary participation on slack need to be studied in conjunction with budget emphasis and information asymmetry, the study of the effect of national culture on slack also need to be studied in conjunction with budgetary participation, budget emphasis and information asymmetry.

Hence, instead of hypothesizing a direct relationship between national culture and subordinates' propensity to create slack, this study proposes that the effect of national culture on slack is complex and is through its effect on participation. It first hypothesizes that national culture affects *budgetary participation*. Second, it develops a model to investigate if *budgetary participation* interacts with budget emphasis and information asymmetry to affect propensity to create slack. Third, since national culture affects budgetary participation, substituting *national culture* for budgetary participation in the model, it investigates if *national culture* interacts with budget emphasis and information asymmetry to affect propensity to create slack.

If these propositions are supported empirically, it may be possible to conclude that national culture may be a proxy for budgetary participation in the slack creation model. This is likely to be useful in the management of slack creation activities because if the national culture (a proxy for budgetary participation) is known, the levels of the subordinates' propensity to create slack can then be predicted and managed by varying the levels of information asymmetry and budget emphasis.

This study proposes that low power distance cultures encourage high employee participation including high budgetary participation. Consequently, top management (superiors) of organizations operating in low power distance countries (e.g. Australia and USA) are likely to allow their employees *high* budgetary participation *so that their policies are in harmony with the cultural values of their employees*. As such, *high* budgetary participation is likely to prevail in organizations operating in *low* power distance cultures such as Australia. In contrast, *low* budgetary participation is likely to prevail in organizations operating in *high* power distance cultures such as Singapore. In other words, *organizations operating in different cultures may not have as much choice on the extent of budgetary participation allowed to their employees as previously assumed*. Instead, the extent of budgetary participation allowed to employees is likely to be dictated by the types of culture of the countries in which the organizations are located. Consequently, organizations operating in a *low* power distance culture (e.g. Australia) should select a combination of budget emphasis and information asymmetry that best fits a *high* budgetary participatory environment to manage its employee slack creation activities. In contrast, organizations operating in a *high* power distance culture (e.g. Singapore) should select a combination of budget emphasis and information asymmetry that best fits a *low* budgetary participatory environment to manage its employee slack creation activities.

Finally, this study may also provide additional empirical evidence in support of the expectation that national culture is likely to influence the extent of budgetary participation. In their studies on the impact of the national cultures of Singapore and Australia on budgetary participation, both Harrison (1992) and Lau et al. (1997) argued that the cultural dimensions of power distance and individualism could *each* by itself affect the extent of budgetary participation. But both studies also argued that these cultural effects might not be discernible in a study involving Australia and Singapore because of the compensating effects of these two cultural dimensions in these two countries. Specifically in Australia, whilst its low power distance encourages high budgetary participation, its high individualism discourages budgetary participation. The reverse occurs in Singapore because whilst its high power distance discourages budgetary participation, its low individualism encourages high budgetary participation. Consequently, both studies hypothesized and found support for the expectation that there were *no* significant difference in the extent of budgetary participation between these two countries.

Our study proposes that Australia and Singapore differ in power distance, *but not in individualism*. Following the arguments of Harrison (1992) and Lau et al. (1997) that the cultural dimensions of power distance and individualism could *each* affect budgetary participation, a significant difference in the extent of budgetary participation between Australia and Singapore is expected in our study. If empirical support for this expectation is found, it will not only support the theory and results of Harrison (1992) and Lau et al. (1997), but will also enable the effects of power distance on budgetary participation to be isolated from those of individualism since the two countries are hypothesized in this study to be have similar levels of individualism.

THEORY DEVELOPMENT AND HYPOTHESES FORMULATION

Participation, Budget Emphasis and Information Asymmetry

Slack is often associated with budgeting and, as is the case here, is regarded as the extent of intentional understatement of subordinates' performance capability built into budgets by subordinates to make budgets easier to attain (Birnberg et al., 1983; Merchant, 1985; Onsi, 1973; Young, 1985). Prior research has identified budget emphasis (Merchant, 1985; Onsi, 1973), budgetary participation (Govindarajan, 1986; Merchant, 1985; Young, 1985) and information asymmetry (Otley, 1978; Young, 1985) as important variables influencing the extent of managers' propensity to create slack. Dunk (1993) investigated the possibility that these three variables may interact to affect slack.

A significant three-way interaction among budgetary participation, budget emphasis and information asymmetry affecting the propensity to create slack is likely to exist. The theoretical justification for this expectation is based on the results pertaining to the beneficial consequences of a compatible combination of *high* budgetary participation and *high* budget emphasis found by researchers in the area of superiors' evaluative styles (e.g. Brownell, 1982b; Brownell & Dunk, 1991; Brownell & Hirst, 1986; Lau et al., 1995). Brownell (1982b) argued that subordinates react favorably to a compatible combination of *high* budget emphasis and *high* budgetary participation because high budgetary participation enables subordinates to influence the level of their budget targets. These targets are important to the subordinates because their rewards are often linked to the attainment of these targets. Since high budgetary participation is a privilege granted to subordinates by their superiors who can withdraw those privileges (Pope, 1984), and since genuine participation can only occur in a climate of mutual trust between the superiors and their subordinates, subordinates who find high budgetary participation useful for their own interests (e.g. influencing budget targets) are likely to want to preserve their high participation privileges and the trust of their superiors. Hence, they are unlikely to risk losing these privileges and their superiors' trust by engaging in slack creation activities. This suggests that *in a high participatory environment*, the subordinates' propensity to create slack is likely to be low when a high budget emphasis is employed.

Apart from relying on high budgetary participation to influence budget targets, subordinates may also rely on high budgetary participation to gain information from their superiors (Brownell & Hirst, 1986; Kren, 1992; Kren & Liao, 1988; Pope, 1984; Simons, 1987). Note that the need to gain information from the superior is likely to occur only when the subordinates do not have substantially more information than their superior, that is, when *information asymmetry* is *low* or when the superior has more information than the subordinates. Hence, high budgetary participation is most useful to subordinates when information asymmetry is low. This suggests that *in a high participatory environment*, subordinates propensity to create slack is likely to be low when information asymmetry is low.

In summary, high budgetary participation is most useful to subordinates in two situations: (1) when budget emphasis is high; *or* (2) when information asymmetry is low. Note that it is not necessary for both conditions to be present for propensity to create slack to be low. When *either* of these two conditions is present, the subordinates are likely to value their high participation privileges and are unlikely to jeopardize them by engaging in slack creation activities. Consequently, their propensity to create slack is likely to be low. In contrast, it is possible that there are some situations when neither of these conditions is present, for instance, in a *low* budget emphasis-*high* information asymmetry situation. In such a situation, and

if high budgetary participation is allowed, it is likely to serve little useful purpose to the subordinates. With no fear of losing their high participation privileges or their superior's trust, subordinates' propensity to create slack may be high.

Note that the above discussion is not likely to be applicable to *low* budgetary participation situations. *If budgetary participation is low*, the need and hence the incentive to preserve budgetary participation privileges may not be there because there is little budgetary participation to preserve in the first place. Low budgetary participation does not mean no participation at all. As long as there is some participation, the potential for slack creation exists. In such situations, it is likely that the level of subordinates' propensity to create slack will be influenced mainly by the preventive measures adopted by the superiors to minimize budgetary slack creation activities. Since budgetary slack is likely to distort performance evaluation only when a high budget emphasis evaluative style is employed to evaluate performance, superiors are likely to implement tighter accounting controls to minimize budgetary slack creation when budget emphasis is high than when budget emphasis is low.

Otley (1978) also suggested that superiors are likely to adopt a high budget emphasis evaluative style only in situations when they are confident that budget targets can be determined accurately. By definition, an accurate budget is one that has little slack. In his study on how superiors chose the evaluative styles they used to evaluate their subordinates, he found that "performance is evaluated by reference to budget standards *only where those standards are valid. Where the budget standards are invalid*, they are not used as important criteria of evaluation (Otley, 1978, p. 139). This suggests that *in a low budgetary participatory environment*, propensity to create slack is likely to be associated mainly with the extent of budget emphasis. Propensity to create slack is likely to be lower for high budget emphasis than for low budget emphasis.

In summary, it is reasonable to conclude that the effect of budget emphasis and information asymmetry on propensity to create slack is likely to be different between a high and a low budgetary participation environment. This suggests a three-way interaction among budgetary participation, budget emphasis and information asymmetry. Accordingly, the following hypothesis is tested:

H1. The effect of budgetary participation on the subordinates' propensity to create slack is conditional upon budget emphasis and information asymmetry.

The Effects of National Culture on Propensity to Create Slack

The possible impact of national culture on budgeting has been suggested by a number of researchers (e.g. Brownell, 1982a; Brownell & Hirst, 1986; Otley, 1978).

With respect to budgetary slack creation, Otley (1978) suggests that the study of budgetary slack creation is incomplete without the inclusion of national culture because of the possible moderating effects of national culture. He suggested that the relationship between information asymmetry and slack creation is complex and likely to be moderated by the societal cultural norms and values.

The theory that national culture affects the subordinates' propensity to create slack is based on the expectation that national culture affects budgetary participation, which, in turn, affects the subordinates' propensity to create slack. If: (i) *participation* interacts with budget emphasis and information asymmetry to affect the subordinates' propensity to create slack; and (ii) *national culture* affects *participation*; then (iii) *national culture* is also likely to interact with budget emphasis and information asymmetry to affect the subordinates' propensity to create slack.

The Effects of National Culture on Budgetary Participation

Based on his review of the literature on participation, Brownell (1982a) found a substantial amount of evidence to support the proposition that culture, through differences in nationality, legal system and religion, may substantially influence the extent of participation. He suggested that "most literature in accounting has . . . tended to overlook the issue of participation as a response to cultural . . . circumstances" (Brownell, 1982a, p. 145). As he considered culture one of the four key classes of variables affecting the extent of participation in the budgetary process, he categorized culture as an *antecedent* variable or the cause of participation. This means that culture is a precondition "that might *dictate* the need for participation" (Brownell, 1982a, p. 145) and hence the *extent* of participation.

In order to test cultural effects on the levels of participation and the subordinates' propensity to create slack, respectively, Hofstede's (1980) cultural framework was adopted in our study. This theoretical framework was selected as it not only provides the theory for a cross cultural study on the subordinates' propensity to create slack to be undertaken, but it enables national culture to be evaluated systematically. The framework has also been tested rigorously by Hofstede (1980), Hofstede and Bond (1988) and other researchers (e.g. Chow et al., 1991; Harrison, 1992; Harrison et al., 1994; Hwang, 1989; Lau et al., 1995; O'Connor, 1995).

Hofstede (1980, p. 25) defines culture as the "collective programming of the mind which distinguishes the members of one human group from another . . ." The four dimensions of culture identified are power distance, individualism, uncertainty avoidance and masculinity. A further dimension of Confucian

dynamism was identified in a subsequent study (Hofstede & Bond, 1988). Among the five dimensions of culture, there is stronger theoretical support for power distance and individualism to influence the extent of subordinates' participation in their organizations' affairs (Brownell, 1982a; Harrison, 1992; Hofstede, 1980) than masculinity, Confucian dynamism and uncertainty avoidance.

Masculinity/femininity refers to the ways societies deal with how the biological differences between the sexes could influence males' and females' roles and social activities. According to Hofstede (1980), whilst the main biological differences between the two sexes are related mainly to procreation, societies, through tradition and cultural influence, make arbitrary choices of what constitutes as suitable behavior for males and females, respectively. Hence, in *high* masculinity societies, sex roles are clearly defined with men being more assertive and dominating than women, whilst women are more nurturing than men. There is also a preference for independence, excelling and the pursuit of achievement and material successes. Hofstede and Bond (1988, p. 11) similarly noted that "if we restrict ourselves to men's value, we find that they contain a dimension from very assertive, competitive, and maximally different from women's value on the one side, to modest and nurturing and similar to women's values on the other. The women in the feminine countries have the same nurturing values as the men; in the masculine countries they are somewhat more assertive and competitive, but not as much so as the men, so that these countries show a gap between men's values and women's values." In business organizations of high masculinity societies, men have better promotional prospects than women and rewards are based on performance rather than needs. In contrast, in *low* masculinity societies, sex roles are fluid with equality between the sexes and a preference for relationships and quality of life. Based on these societal norms, it is unclear if the extent of participation is likely to be different between high and low masculinity societies. Moreover, the results of Hofstede and Bond (1988) also indicate that the masculinity score of Australia (score = 61) is close to that of Singapore (score = 48). The closeness of these scores indicates that it is unlikely that this dimension will be responsible for the differences in the scores of the variables included in this study.

Confucian-dynamism refers to societal orientation, whether to the future (long term orientation) or to the past and the present (short term orientation). A *high* Confucian-dynamism society has a dynamic, future-oriented mentality. Values associated with *high* Confucian-dynamism include "persistence (perseverance), ordering relationships by status and observing this order, thrift and having a sense of shame" (Hofstede & Bond, 1988, p. 17). In contrast, a *low* Confucian-dynamism society has a more static, tradition-oriented mentality. Values associated with low Confucian-dynamism are "personal steadiness and stability, protecting your face, respect for tradition and reciprocation of greetings, favors and gifts"

(Hofstede & Bond, 1988, p. 17). The results of Hofstede and Bond (1988) found that the Confucian-dynamism score of Australia (score = 31, rank = 11) is close to that of Singapore (score = 48, rank = 8). Based on these societal norms and the closeness of the scores between Australia and Singapore, it is reasonable to conclude that Confucian-dynamism is unlikely to be have an important effect on the extent of participation or be responsible for the difference in the scores of other variables included in this study.

Uncertainty avoidance refers to the extent societies are willing to tolerate uncertainty (Hofstede, 1980). Hofstede (1980, p. 154) suggested that "human society has developed ways to cope with the inherent uncertainty of our living on the brink of an uncertain future. These ways belong to the domains of technology, law and religion . . . Technology includes all human artifacts; law, all formal and informal rules that guides social behavior; religion, all revealed knowledge of the unknown." Hofstede and Bond (1988, p. 11) similarly suggested that people in high uncertainty avoidance cultures adhere to "strict laws and rules, safety and security measures and a belief in absolute Truth: There can be only one Truth and we have it." Hence, organizations cope with internal uncertainty by establishing rules and regulation. Uncertainty is reduced because rules and regulation make subordinates behave in predictable manners. Consequently, individuals in high uncertainty avoidance societies face high rule orientation. Conversely, people in low uncertainty avoidance societies generally have low rule orientation. Uncertainty avoidance has been measured for Australia and Singapore by Hofstede (1980) and Harrison et al. (1994). The results of both studies indicate that the difference in uncertainty avoidance scores between Australia and Singapore are not significantly different between the two nations (see Table 1). Hence, their effects on budgetary participation are effectively controlled for or neutralized. It is therefore reasonable to conclude that the difference in the extent of budgetary participation as well as those of other variables included in this study between Australia and Singapore are unlikely to be caused by uncertainty avoidance.

Power Distance and Budgetary Participation

Power distance refers to the distribution of power between the superior and the subordinate. It is defined as "the difference between the extent to which (the superior) can determine the behavior of (the subordinate) and the extent to which (the subordinate) can determine the behavior of (the superior)" (Parenthesis added) (Hofstede, 1980, p. 99).

In high power distance cultures, hierarchies are institutionalized to formalize inequalities with power concentrated in the superiors. This arrangement is accepted

Table 1. Cultural Dimensions Indices.

	Australia	Singapore	Difference	Significance Level ($p<$)	
				1-Tailed	2-Tailed
Power distance					
Lau et al. (1997)	26	60	34	0.045	
Harrison et al. (1994)	32	73	41	0.021	
O'Connor (1995)	n/m	61	n/m	–	
Harrison (1992)	58	92	34	0.045	
Hwang (1989)	2	67	65	0.001	
Hofstede (1980)	36	74	38	0.029	
Individualism					
Lau and Tan (1998)	55	47	8	0.375	0.741
Lau et al. (1997)	47	41	6	0.401	0.803
Harrison et al. (1994)	78	46	32	0.092	0.184
Harrison (1992)	69	36	33	0.085	0.171
Chow et al. (1991)	n/m	31	n/m		–
Hofstede (1980)	90	20	70	0.002	0.004
Uncertainty avoidance					
Present study	30	31	1	0.484	0.968
Harrison et al. (1994)	31	47	9	0.354	0.708
Hofstede (1980)	61	52	16	0.253	0.506

by both the superiors and the subordinates. Hofstede (1980, p. 97) maintains that "differences in the exercise of power in a hierarchy relate to the value systems of both bosses and subordinates . . . Subordinates as a group are accessory to the exercise of power in a hierarchical system." This acceptance of centralization of power by all sides leads to a similar acceptance of centralization of decision-making with little or no participation from subordinates. Hofstede (1980, p. 101) also states that "in a highly stratified society where all the powers are concentrated in the hands of the superior, the subordinate learns that it can be dangerous to question a decision of the superior . . . people learn to behave submissively . . . Then, when there is no reason to fear, they still do not feel that it is natural to speak up." Additionally, individuals living in high power distance societies have been found to have low levels of interpersonal trust and cooperativeness (Hofstede, 1980). Since participation requires some degree of mutual trust between the negotiating parties (Pope, 1984), the low level of trust in high power distance societies may undermine the effectiveness of participation. Hence, it is likely that, in high power distance societies, the extent of budgetary participation by subordinates is likely to be low.

In contrast, *low* power distance societies de-emphasize dominance and stratification (Hofstede, 1980). Inequality is minimized with power distributed between the superiors and the subordinates. Hierarchies exist for administrative convenience rather than to classify people. In such environments, superiors and subordinates regard and treat each other as equal, with equal rights, and are interdependent. People are secure and do not feel threatened by each other. Hence, there exists a high degree of interpersonal trust.

The notion that power distance is related to interpersonal trust has been suggested by Hofstede (1980, p. 116) and other researchers. For instance, in a study involving Peru (high power distance culture) and the USA (low power distance culture), Williams et al. (1966) found that subjects from the USA scored much higher in terms of interpersonal trust than the Peruvian subjects. Negandhi and Prasad (1971) similarly found that subjects from several high power distance countries including Argentina, Brazil, Uruguay and the Philippines had lower interpersonal trust scores than the subjects from the USA which has a lower power distance culture than these countries. Doney et al. (1998, p. 612) suggested a theoretical framework to link power distance to interpersonal trust. According to them, in high power distance cultures, people behave opportunistically because "norms supporting power differentials also provide evidence that targets (people) will act for personal gain." Since opportunistic behaviors are more prevalent in a high power distance culture, they concluded that "trustors in high power distance cultures are more likely to form trust *via a calculative process*." However, trust created by such a process is unlikely to be enduring because "trust formed via a calculative process is based on behavior control: the trustor's actions are designed to get a target to do what the trustor wants . . . Once established, trust endures as long as the trustor continues to believe it is contrary to the target's best interest to cheat. *The fact that trust formed via a calculative process is deterrence based suggests that it may be destroyed easily*" (Emphasis added). In contrast, they suggested that trust created in low power distance cultures is likely to be more enduring because:

> In low power distance societies . . . people value relationships based on mutual and comparable dependence and group affiliation . . . Such norms and values provide trustors . . . with evidence that a target's intentions are benevolent . . . trustors in low power distance culture are more likely to form trust *via an intentionality process* . . . Trust evolves via an intentionality process, when trustors perceive that targets share their values and beliefs, lasts as long as trustors remain confident that targets' motives are benevolent. Strong underlying similarities and commonalities between the two parties protect the relationship in the event that trust is violated. Because trust formed through an intentionality process *will be robust to crisis* in the relationships, effort to establish and maintain such trust will be well spent (Doney et al., 1998, p. 613) (Emphasis added).

In summary, the above discussion suggests that societal norms in low power distance cultures are likely to lead to a reluctance to accept centralization of

decision-making, and a preference to participate in organizational affairs. Hence, in low power distance societies, the extent of budgetary participation is likely to be high.

Individualism and Budgetary Participation

Individualism (or collectivism) "describes the relationship between the individual and the collectivity which prevails in a given society" (Hofstede, 1980, p. 235). Triandis (1988, p. 75) suggested that the analysis of individualism-collectivism is dependent upon three factors. These are: (1) the number of ingroups; (2) the extent of the sphere of influence of each ingroup; and (3) the depth of this influence. According to this conceptualization, the smaller the number of ingroups that influence the behavior of people, the higher will be the extent and depth of influence of these ingroups. In such societies, a small number of ingroups dominates all aspects of a person's life. Consequently, such societies are likely to be highly collectivistic. At the extreme, basic *collectivism* is deemed to exist if *one ingroup totally* determines all or a very *large* number of behaviors of the people. In his study of Chinese people, Bond (1991, p. 6) attributed the high collectivism among the Chinese society to the dominating influence of the family ingroup. He noted that:

> The Chinese child is brought up to regard home as a refuge against the indifference, the rigours, and the arbitrariness of life outside. . .Constantly during this process, one is taught to put other family members before one-self . . . Family relationships become a lifelong affair, with family activities continuing to absorb the lion's share of one' time and responsibility. Even after one has married, the obligations continue.

In contrast, if a large number of ingroups influence peoples' behaviors, the extent and depth of influence of each ingroup is likely to be small. Such societies are likely to be highly individualistic. Hence, the larger the number of ingroups that influence the behavior of people, the more individualistic is the society. At the extreme, basic *individualism* is deemed to exist if *no* ingroup determine any of the person's behavior. In between the two extremes (basic collectivism and basic individualism), there is an infinite variety of individualism-collectivism. Even within the same race, variations can occur. Bond (1991, p. 39) noted that "my own multicultural survey of specifically Chinese values . . . among people from 19 countries produced some fascinating results . . . Chinese cultures do not endorse the same values. On a dimension of collectivism, Singapore, Hong Kong, the People's Republic of China, and Taiwan occupied positions 10, 7, 4, and 1." For practical purpose, Triandis (1988) suggested that:

> . . . in describing a culture, it will probably be sufficient to sample some of the major ingroups and behaviours . . . In highly-collectivist cultures . . . the ingroup regulates almost all areas of social behaviour. By contrast, highly individualistic cultures allow individual much freedom, and ingroups can control a very limited range of social behaviour.

Low individualism societies are therefore characterized by a collectivity-orientation, with emphasis on the interest of the society, group, family and clan rather than the interest of an individual. Individuals have emotional dependence on their organizations that provide security to the individuals. With such close belonging and relationships with their organizations, individuals are greatly concerned with the fate of their organizations because of its effects on their lives. Consequently, there is a strong desire to be involved in the decision making process of their organizations and a belief in group decisions. Hence, in low individualistic societies, the extent of budgetary participation is likely to be high.

In contrast, when individualism is *high*, the orientation is to "self" with emphasis on the individual rather than the group, family or organization. Individuals do not have such close relationships with their organizations and are emotionally independent of them. The emphasis is also on individual initiative and achievement, rather than group achievement. High individualism also stresses leadership and a belief in individual decisions. Based on his review of past research, Hofstede (1980, p. 230) concluded that in *high* individualistic societies "(1) managers aspire to leadership and variety; (2) managers rate having autonomy more important; and (3) individual decisions are considered better than groups decisions." Harrison et al. (1994, p. 249) suggested that individualism "encompasses attributes of freedom, autonomy, initiative and challenge." Leung and Lind (1986, p. 1135) similarly suggested that "in individualistic societies, values such as autonomy, competitiveness achievement and self sufficiency are emphasized more." These connotations suggests that exercising initiative, leadership and making decisions on one' own are socially encouraged in high individualistic societies Hence, in such societies, superiors are more comfortable in making decisions on their own and believing in their own decisions, than in trusting and consulting their subordinates. Consequently, in high individualistic societies, superiors are likely to allow their subordinates few opportunities to participate in organizational affairs.

Note that it is generally the superiors rather than the subordinates who are primarily responsible for determining the extent of the subordinates' participation in organizational affairs. Triandis (1988, p. 76) suggested that "highly-individualistic cultures allow individual much freedom, and *ingroups can control a very limited range of social behaviour*" (Emphasis added). This means that not only will

superiors in high individualistic societies adopt a low participative leadership style, they are also *not* likely to be swayed or influenced by others such as their subordinates to allow others to participate in decision making. Consequently, the extent of budgetary participation the subordinates enjoy in a high individualistic society is likely to be dependent upon the type of leadership style adopted by the superiors rather than upon what the subordinates want, because ultimately it is the superiors who make the final decisions.

There are also suggestions that the low participatory work environment in a high individualistic culture is not only favored by the superiors, but is also likely to be supported by the subordinates. For instance, Harrison et al. (1994, p. 249) suggested that "in high individualism societies . . . individual initiative is *socially encouraged*, compared with low individualism societies in which such initiative is *socially frowned upon*" (Emphasis added). In his discussion on power distance, Hofstede (1980, p. 97) suggested that "differences in the exercise of power . . . relate to the value systems of both bosses and subordinates . . . pattern of inequality between groups in society are *supported by both dominant and subordinate value systems . . . Subordinates as a group are accessory to the exercise of power*" (Emphasis added). This suggests that patterns of behaviors associated with cultural dimensions are supported not by only some in the society, but *by the society as a whole*. Based on these discussions, it is reasonable to conclude that subordinates, who share the same cultural values as their superiors, are likely to support a low participatory operating environment because such styles are socially acceptable and encouraged in a high individualistic culture. *Hence, the extent of budgetary participation is likely to be low in high individualism societies*.

Selection of Nations for Study

The above discussion focuses on the effects of national culture on the extent of *budgetary participation* rather than the effects of national culture on the subordinates' *propensity to create slack*. This discussion is important because this study proposes that the effect of national culture on the subordinates' *propensity to create slack* is not a direct one. Instead, the effect of national culture on the subordinates' propensity to create slack is likely to be through its impact on the extent of *budgetary participation*. In other words, national culture is likely to affect budgetary participation. Budgetary participation, in turn, is likely to affect the subordinates' propensity to create slack. Consequently, in order to enable the relationship between national culture and the extent of the propensity to create slack to be tested, it is necessary to select for comparison two nations having cultures that are likely to differ in the extent of budgetary participation predicted.

In order for a *significant difference* in budgetary participation between two cultures *to be observed*, several alternatives are possible. The *first* alternative is to vary power distance and hold individualism constant so that any difference in the budgetary participation scores can then be attributed to power distance and not individualism. The second alternative is to vary individualism and hold power distance constant so that any difference in the budgetary participation scores can then be attributed to individualism and not power distance. The third alternative involves a comparison between: (1) a high power distance-high individualism culture (high participatory); and (2) a low power distance-low individualism culture (low participatory), although with this alternative, it would be unclear if the effect is attributable to power distance alone or individualism alone or both. If all these alternatives are investigated, data from more than two cultures are needed. Since the resources needed to collect data from more than two nations are high and since it is not crucial that all alternatives need to be included for the hypotheses in this study to be tested, we have selected the *first* alternative. The primary objective of our study involves the effects of *national culture* on the subordinates' *propensity to create slack*. If it is possible to demonstrate how one dimension of culture (e.g. power distance) affects budgetary participation, and the difference in budgetary participation is observable, the hypotheses can be tested and conclusions on how culture influences budgetary slack creation can be made. Consequently, two nations with a difference in power distance but similar in individualism are needed for our study.

Australia and Singapore were selected because they are likely to differ in terms of power distance but not in individualism. Consequently, a significant difference between their budgetary participation scores is likely to be observable. Hofstede (1980) and other studies (e.g. Harrison, 1992; Harrison et al., 1994; Hwang, 1989; Lau et al., 1997) clearly indicate that Australia has a relatively low power distance culture whilst Singapore has a relatively high power distance culture (see Table 1). Whilst the results indicate some fluctuations in the absolute scores among the studies, the differences between the scores of the two nations are maintained across different studies. Except for Hwang's (1989) study, the differences are remarkably similar. Importantly, all studies indicate that the power distance scores of Singapore are statistically significantly higher than those of Australia ($p < 0.05$).

In contrast, Table 1 indicates that even though the Australian individualism scores are consistently higher than those of Singapore, none of the studies, with the exception for Hofstede (1980), were able to find differences with a statistical significance level of $p < 0.05$ between the two nations' scores. The two-tailed test results indicate that none of the studies, with the exception for Hofstede (1980), were able to find differences with a statistical significance level of $p < 0.05$

between the two nations' scores. Even with the one-tailed test, the results similarly indicate that none of the studies, with the exception for Hofstede (1980), were able to find differences with a statistical significance level of $p < 0.05$ between the two nations' scores. Both Harrison (1992) and Harrison et al. (1994) are in excess of 0.05 and therefore only marginally significant.

The narrowing of individualism scores between the two nations over the years since the study by Hofstede (1980) is caused *partly* by an increase in the individualism scores of Singapore from 20 to 47. Hofstede (1980, p. 231) found a strong correlation between individualism and national wealth (GNP per capita). Hofstede and Bond (1988) also found that as nations become wealthier, their cultures become more individualistic. Since 1970, Singapore has grown rapidly and emerged as one of the wealthiest nations in the world (and the second wealthiest in Asia [after only Japan]). Hence, it is likely that the increase in the individualism score of Singapore since the study by Hofstede (1980) could be caused by an increase in the national wealth of Singapore. Apart from the increase in Singapore individualism scores, the narrowing of the individualism scores between Australia and Singapore is also affected by the decrease in the individualism scores of Australia. Since Hofstede's (1980) study, the individualism scores of Australia have declined from 90 to 55 (Lau & Tan, 1998). With the more recent studies, Table 1 indicates that for Australia, the individualism scores have shown a decline from 69 (Harrison, 1992) to 55 (Lau & Tan, 1998).

In summary, the overall pattern of results suggests that the difference in individualism score between Australia and Singapore is not significantly different. Even with Harrison (1992) and Harrison et al. (1994) with reported difference of 33 and 32, respectively, these differences are only marginally significant if a one-tailed test is used. They are not significant if a two-tailed test is used. Hence, it is reasonable to suggest that: (1) a significant difference in the budgetary participation scores between the two nations is likely to be observable; and (2) this significant difference in the budgetary participation scores is attributable mainly to the difference in the power distance between these two nations. In order to ascertain if the cultures of Australia and Singapore are in accordance with the expectations suggested in this study, the following hypotheses are tested:

H2. The power distance score of Australia is significantly higher than that of Singapore.

H3. There is no significant difference in the individualism scores between Australia and Singapore.

As it has been argued previously that the *low* power distance culture of *Australia* is likely to be associated with a *high* extent of budgetary participation, whereas

the *high* power distance culture of *Singapore* is likely to be associated with a *low* extent of budgetary participation, the following hypothesis is tested:

H4. National culture (power distance) has a significant effect on the extent of budgetary participation. The extent of budgetary participation in *low* power distance cultures (e.g. Australia) is significantly *higher* than that of *high* power distance cultures (e.g. Singapore).

Three-Way Interaction Among National Culture, Budget Emphasis and Information Asymmetry

It was argued previously that the effects of national culture on managers' propensity to create slack is not likely to be one involving a simple direct relationship. *Hence, national culture is hypothesized to have no main effect on propensity to create slack.* Instead, the effect of national culture on propensity to create slack is likely to be through its effect on *budgetary participation*. Recall that it was argued previously for Hypothesis H1 that the effect of *budgetary participation* on propensity to create slack is also not straightforward. Instead, the effect of budgetary participation on propensity to create slack is likely to be *conditional upon budget emphasis and information asymmetry*. Since national culture is likely to affect *budgetary participation* (see Hypothesis H4); and since the effect of *budgetary participation* on propensity to create slack is likely to be conditional upon budget emphasis and information asymmetry (see Hypothesis H1); it is therefore likely that the effect of *national culture* on propensity to create slack is also conditional upon budget emphasis and information asymmetry. Accordingly, the following hypothesis is tested:

H5. National culture has *no* main significant effect on managers' propensity to create slack. Instead, the effect of national culture on managers' propensity to create slack is conditional upon budget emphasis and information asymmetry.

METHODOLODY

A survey method involving a mailed questionnaire was used to test the hypotheses. With the Australian subsample, manufacturing organizations each employing more than 100 employees, were selected randomly from *Kompass Australia*. Manufacturing companies were selected because the use of budgets in these organizations is common. The selection of companies with more than 100 employees each provides some degree of control over the size of the organizations, as small

organizations are likely to rely more on informal rather than on formal budgetary control systems. The heads of the manufacturing function were selected for study to provide some degree of control over the level of seniority of management and the possible influence of the functional differentiation of activities (Hayes, 1977; Thompson, 1967).

The selected organizations were contacted by telephone to obtain the names of the manufacturing managers so that the questionnaire could be mailed directly to, and answered by, the intended participants. A questionnaire was administered to a sample of 120 managers. The administration of the questionnaire involved the following steps. An initial letter introducing the researchers and the study was mailed to each of the intended participants. A week later, this was followed by the questionnaire with a covering letter and a reply-paid self-addressed envelope for the purpose of returning the questionnaire. The covering letter assured the participants confidentiality of information and if requested, a copy of the summarized results. Reminder letters were mailed to those who had not responded three weeks after the mailing of the questionnaire. A final attempt was made a week later to contact by telephone calls, those who had not responded. Fifty-four responses were received resulting in a response rate of 45%. Two responses were not useable, as they were not answered by the manufacturing managers. Five respondents had lived in Australia for less than 5 years. However, as four were from Great Britain and one was from New Zealand, all their responses were included in the study as Great Britain, New Zealand and Australia were regarded by Hofstede (1980, p. 336) as belonging to the same Anglo-Saxon cultural block. This resulted in 52 useable responses. A follow-up part of the questionnaire, comprising items pertaining to the cultural dimensions of power distance and individualism, and mailed to those respondents who had answered the initial part of the questionnaire, yielded a response rate of 81%.

Similar methods and procedures were used in the sample selection and questionnaire administration in Singapore. One hundred and twenty questionnaires were mailed out in Singapore to match the 120 mailed out in Australia. A total of 63 Singaporean responses were received yielding a response rate of 53%. Of the 63 responses, 11 responses were not useable, as the responses to the focal variables were incomplete, including eight that indicated that budgets were not used in their organizations. A further one response was excluded from the study as the respondent was not a Singaporean and had not lived in Singapore for more than five years. This left the study with 51 useable responses. A follow-up part of the questionnaire, comprising items on the cultural dimensions of power distance and individualism, and mailed to those respondents who had answered the initial part of the questionnaire, yielded a response rate of 65%. Non-response bias tests suggested by Oppenheim (1992) indicated that the responses of the early and late

responding were not significantly different for either part of the questionnaire for both the Australian and Singaporean subsamples.

As noted above, the questionnaire comprised two parts. The first part of the questionnaire included items pertaining to the managers' propensity to create slack, budget emphasis, budgetary participation, information asymmetry and demographic characteristics. *Responses to this part of the questionnaire were used for testing all hypotheses (H1, H4 and H5), except for those involving calculations of the cultural scores of power distance and individualism (H2 and H3)*. The follow-up part of the questionnaire comprised items pertaining to the cultural dimensions of power distance and individualism. *Responses to this part of the questionnaire were used for the purpose of calculating the cultural scores of power distance and individualism (H2 and H3)*. Note that power distance score and individualism score are the cultural scores of *nations* examined, and *not for the individual respondents*. Hence only a *single* power distance score and a *single* individualism score were computed for *each* nation. For instance, only a single power distance score of 7 was computed for Australia and this score was based on the responses of all the Australian managers who answered the follow-up part of the questionnaire. Since only a single (national) cultural score based on all the responses was computed, it was not necessary for all the respondents, who had answered the first part of the questionnaire, to also answer the follow-up part of the questionnaire, before the cultural scores could be computed. This is the reason why Hypotheses H2 and H3, which pertain to the calculation of cultural scores, are based on the responses to the *follow-up* part of the questionnaire, whereas Hypotheses H1, H4 and H5, which do not involve any calculation of cultural scores, are based on the responses to the *first part* of the questionnaire.

MEASUREMENT INSTRUMENTS

Budget Emphasis

Budget emphasis was measured with Hopwood's (1972) instrument (rated version). This instrument was adopted as it is one of the most widely used instruments to measure managers' evaluative styles (e.g. Brownell, 1982b; Brownell & Dunk, 1991; Brownell & Hirst, 1986; Dunk, 1993; Harrison, 1992; Otley, 1978). For the purpose of this study, only the item "Meeting the budget" was used as a measure of budget emphasis. Hopwood (1972, p. 160) had intended this item to be linked to situations when a cost center head's performance was based on ability to "continually meet the budget on a *short term* basis" (Emphasis added). Since the subordinates' propensity to create slack is likely to be important only when

there is a *short-term* emphasis on meeting budgeted targets, the score of the item, "Meeting the budget" is the most appropriate measure of budget emphasis. For his measure of budget emphasis, Harrison (1992) modified Hopwood's item "Meeting the budget" to "My ability to meet budgeted targets in the short run." As this modified item clearly emphasized short run budget targets, it was employed in this study. Even though Hopwood's instrument has been used frequently by studies involving performance evaluative style (e.g. Brownell, 1985; Brownell & Dunk, 1991; Dunk, 1993; Harrison, 1992; Hopwood, 1972; Lau et al., 1995), and seems most appropriate for the purpose of this study, the use of a single item to measure the extent of budget emphasis does not permit validity test to be undertaken.

Budgetary Participation

The Milani (1975) six item instrument was employed to measure budgetary participation as it had been tested and used very extensively (e.g. Brownell, 1982b; Brownell & Dunk, 1991; Brownell & Hirst, 1986; Dunk, 1993; Frucot & Shearon, 1991; Harrison, 1992; Mia, 1989; Nouri & Parker, 1996) and had been found to show consistently high internal consistency. It had also been cross-validated with the Hofstede (1968) measure by both Brownell (1982b) and O'Connor (1995). The Cronbach alpha of 0.88 for the Australian subsample, 0.87 for the Singaporean subsample, and 0.89 for the pooled sample obtained in this study indicate high internal consistency (see Table 3). The factor analysis results indicate that all the six items of the instrument loaded satisfactorily on a single factor.

Information Asymmetry

Shields and Young (1993) and Dunk (1993) have both developed instruments for measuring information asymmetry. Shields and Young were concerned with measuring the information asymmetry existing between local managers and *headquarters* management. Since this condition was not a feature of our study, we selected Dunk's instrument, which was developed to measure superior-subordinate information asymmetry between superiors and subordinates located in the same place.

Based on our sample, the Cronbach alphas for this instrument are 0.75 for the Australian subsample, 0.74 for the Singaporean subsample and 0.76 for the pooled sample (see Table 3). A factor analysis for the pooled sample indicates that five of the six items loaded on the first factor whilst one item loaded on the second factor. The first factor (with five items) had an eigenvalue of 2.8, accounted for 47% of the

variance and had factor loadings above 0.64 for all five items. The second factor (with 1 item) had an eigenvalue of 1.066 and accounted for 18% of the variance. The item in the second factor was included with the other 5 items in the first factor to form the measure for information asymmetry for this study because: (i) the item in the second factor had a satisfactory factor loading of 0.497 on the *first* factor; (ii) the eigenvalue of the second factor is barely over one; and (iii) the results of tests of hypothesis were not affected by the inclusion of the item in the information asymmetry instrument. The factor analysis results for the Australian and Singaporean subsamples were similar to those of the pooled sample.

Propensity to Create Slack

Onsi's (1973) instrument, which focuses on subordinates' attitudes towards slack creation, was selected for this study for a number of reasons. First, it is a relatively well-established instrument used in almost all of the studies on budgetary slack involving questionnaire surveys. These studies have generally reported satisfactory Cronbach alpha statistics (e.g. 0.7 for Merchant, 1985; 0.75 for Nouri, 1994; 0.75 for Nouri & Parker, 1996; 0.74 for Lal et al., 1996). Second, Onsi's instrument also not only measures subordinates' attitudes toward slack creation, it also implicitly measures *subordinates' intention* to create slack. A measure of the subordinates' *intention* to create slack is consistent with the definition of slack as defined in this study, which is the extent of intentional understatement of the subordinates' performance capability built into the budget by subordinates. Third, unlike Dunk's (1993) instrument, which measures slack created by both subordinates and superiors, Onsi's instrument is a measure of only the *subordinates*' propensity to create slack. Slack created by the superiors is clearly excluded. Since this study is concerned with the *subordinates*' propensity to create slack, the version of Onsi's instrument, as modified by Govindarajan (1986) for wider field survey application, was used in this study.

The Cronbach alphas obtained for propensity to create slack are 0.62 for the Australian subsample, 0.75 for the Singaporean subsample and 0.70 for the pooled sample (see Table 3). Whilst some studies have considered Cronbach alpha values of between 0.5 and 0.6 as acceptable (e.g. Brownell & Dunk, 1991; Chow et al., 1996; Merchant, 1985; Shields & Young, 1993), others have recommended higher levels (e.g. 0.70 by Nunnually, 1978). For our study, the Cronbach alpha for the Singapore subsample and the pooled (combined) sample are at least 0.70. Nevertheless, since the Cronbach alpha obtained for the Australian sample is 0.62, caution should be exercised in interpreting the results of tests involving this subsample. A factor analysis supported the

Table 2. Descriptive Statistics of Independent and Dependent Variables ($n = 103$).

Variables	Mean	Std. Dev.	Range				
			Theoretical		Actual		Cronbach
			Min	Max	Min	Max	Alpha
Budget emphasis							
Australia	5.558	1.162	1	7	2	7	na
Singapore	5.686	1.122	1	7	3	7	na
Pooled sample	5.621	1.139	1	7	2	7	na
Budget participation							
Australia	33.577	6.252	6	42	10	41	0.88
Singapore	29.961	5.363	6	42	17	39	0.87
Pooled sample	31.786	6.078	6	42	10	41	0.89
Information asymmetry							
Australia	32.029	5.279	6	42	13	41	0.75
Singapore	29.349	6.297	6	42	16	42	0.74
Pooled sample	30.702	5.932	6	42	13	42	0.76
Propensity for slack							
Australia	13.212	4.474	4	28	4	21	0.62
Singapore	14.373	5.246	4	28	4	25	0.75
Pooled sample	13.786	4.882	4	28	4	25	0.70

unidimensional nature of the four items as they all loaded satisfactorily on a single factor.

Power Distance and Individualism

The cultural dimensions of power distance and individualism were measured with Hofstede's (1980) instruments. As Hofstede's instruments were designed to measure "culture" and not individual personality (Hofstede, 1980, p. 76), only a *single* nation score for the Australian subsample and another for the Singapore subsample were calculated for each of the two cultural dimensions. The computation of the individualism score for this study was based on the coefficients (for the mean scores of each work goal question) derived by Harrison (1992).

Summary descriptive statistics for all of the independent and dependent variables were presented earlier in Table 2. The intercorrelations among the variables are presented in Table 3.

Table 3. Correlation Matrix Among Independent and Dependent Variables (Pooled sample).

Variable	Budget Emphasis	Budgetary Participation	Information Asymmetry	National Culture[#]
Budgetary participation	0.132			
Information asymmetry	0.097	0.160		
National culture[#]	−0.056	0.295[**]	0.224[*]	
Propensity for slack	−0.327[**]	−0.237[*]	−0.170	−0.118

[**] $p < 0.01$ (2-tailed).
[*] $p < 0.05$ (2-tailed).
[#] Point biserial correlation.

RESULTS AND DISCUSSION

Hypothesis H2: Power Distance

Before tests of the cultural effects on the propensity to create slack could be undertaken, it was necessary to verify whether Australia is culturally different from Singapore. Table 4 presents the results of the cultural dimensions of power distance and individualism for the two nations.

The results indicate that Singapore has a power distance index value of 51 whilst Australia has a power distance index value of 7, resulting in a difference of 44 between the two nations. In order to calculate the statistical significance of difference in cultural scores between countries, a distribution data based on as a large number of countries is needed. As our study has adopted Hodstede's cultural framework and more importantly, his measurement instruments for cultural dimensions, his 1980 distributional data constitutes the closest available data to compute the statistical significance of differences in cultural scores. Consequently, in order to ascertain if the difference of 44 in power distance between Australia and Singapore found in this study is significant or not, the power distance scores

Table 4. Cultural Dimension Scores.

Nation	Power Distance	Individualism
Singapore	51	50
Australia	7	76
Difference	44	26
Significance level $p <$	0.014 (1-Tailed)	0.280 (2-Tailed)

for the 40 nations examined by Hofstede (1980) were treated as a power distance distribution. It should be noted that the use of Hofstede's (1980) distribution data is not as accurate as an analysis that is based on an updated distribution data.

The standard deviation based on Hofstede's (1980) distribution is 20. The difference of 44 between Singapore and Australia thus represents 2.2 standard deviations and is significant at $p < 0.014$ (one-tailed). A one-tailed test is used here because the direction of power distance for Australia and Singapore has been hypothesized in this study. The significant difference in power distance between the two nations found in this study supports prior studies' findings (e.g. Harrison, 1992; Harrison et al., 1994; Hofstede, 1980; Lau et al., 1997) that the power distance of Singapore is significantly higher than that of Australia. Hence Hypothesis H2, which states that there is a significant difference in the power distance scores between Australia and Singapore, is supported.

Hypothesis H3: Individualism

With respect to individualism, Table 4 indicates that the individualism score for Singapore is 50 whilst that for Australia is 76, providing a difference of 26 between the two nations. Using Hofstede's (1980) scores for the 40 nations as the distribution (standard deviation = 24), the difference of 26 for the present study represents 1.08 standard deviations that is not significant ($p < 0.280$, 2-tailed). A two-tailed test is used here because we have hypothesized that the individualism scores of Australia is not significantly different from that of Singapore. This result is consistent with the results of other recent studies (e.g. Lau & Tan, 1998; Lau et al., 1997) that also did not find a significant difference between the individualism scores of Australia and Singapore. Accordingly, Hypothesis H3, which states that there is *no* significant difference between the individualism scores of Australia and Singapore, is supported. Since individualism is not different between the two nations, the hypothesized difference in the extent of budgetary participation between the two nations cannot be related to the cultural differences in individualism.

Hypothesis H4: Levels of Budgetary Participation in Australia and Singapore

To test for cultural differences in the extent of budgetary participation occurring in Australia and Singapore, a *t*-test was undertaken. The result indicates that the mean participation score of 33.58 for the Australian subsample (see Table 2) is

significantly higher than the mean score of 29.96 for the Singaporean subsample ($t = 3.148$; $p < 0.001$, 1-tailed). Accordingly, Hypothesis H4, which states that the level of budgetary participation of Australian managers is significantly higher than that of the Singaporean managers, is supported.

Hypothesis H5: Relationship Between National Culture and Propensity for Slack

In order to ascertain if national culture directly affects the managers' propensity to create slack, a regression of propensity to create slack on national culture was undertaken. The results indicate that national culture has no significant main effect on propensity to create slack (std. coeff $= -0.118$; $t = -1.209$; $p < 0.229$). Hence, Hypothesis H5, which states that national culture has *no* significant *main* effect on managers' propensity to create slack, is supported.

Hypothesis H5 also states that the effect of *national culture* on managers' propensity to create slack is conditional upon budget emphasis and information asymmetry. Before the test for this hypothesis is undertaken, it is necessary to ascertain if Hypothesis H1, which states that the effect of *budgetary participation* on managers' propensity to create slack is conditional upon budget emphasis and information asymmetry, is supported. The results indicate that the coefficient of the three-way interaction between *budgetary participation*, budget emphasis and information asymmetry affecting the propensity to create slack is highly significant (est $= -0.04$, $p < 0.006$; $R^2 = 0.282$). Based on these results, Hypothesis H1 is supported.

The results for Hypothesis H4 indicate that national culture has a significant effect on budgetary participation. Budgetary participation, in turn, affects propensity to create slack, *only through its interaction with budget emphasis and information asymmetry* (Hypothesis H1). These results suggest that the effect of national culture on propensity to create slack is also likely to be through the *interaction* of national culture with budget emphasis and information asymmetry. Hence, *an interaction regression model, rather than a path analytical model*, is more appropriate for testing the effects of national culture on propensity to create slack. Accordingly, the following interaction model is used to test Hypothesis H5, which states that the effect of *national culture* on managers' propensity to create slack is likely to be conditional upon budget emphasis and information asymmetry:

$$Y_i = b_0 + b_1 C_i + b_2 B_i + b_3 I_i + b_4 C_i B_i + b_5 C_i I_i + b_6 B_i I_i + b_7 C_i B_i I_i + e_i \quad (1)$$

where

Y_i = Propensity to create slack;
C_i = National culture
B_i = Budget emphasis
I_i = Information asymmetry
e_i = Error term.

Consistent with prior studies (e.g. Harrison, 1992), the national culture variable C_i in the regression models is treated as a dichotomous variable and is represented by a dummy variable of "1" for the Australian culture and "zero" for the Singaporean culture. The rationale for using dummy variables rather the individual responses to the relevant cultural dimension items is that the cultural instruments developed by Hofstede (1980) are intended to measure societal cultures rather than individual personalities. Tests undertaken to ensure that the inherent assumptions of the selected regression models are satisfied, indicate that the normality assumption, the homogeneity of variance of residuals and the appropriateness of the linear models are not violated.

Table 5 presents the results of the three-way interaction among *national culture*, budget emphasis and information asymmetry affecting propensity to create slack. Coefficient b_7 for the three-way interaction is highly significant (est $= -0.433$, $p < 0.003$). The R^2 of three-way interaction model is 0.208. Based on these results, Hypothesis H5, which states that the effect of *national culture* on managers' propensity to create slack is conditional upon budget emphasis and information asymmetry, is supported.

Table 5. Results of Regression of Propensity to Create Slack on Culture, Budget Emphasis and Information Asymmetry ($n = 103$).

Variable	Coeff	Est	*t*-Value	*P*
Constant	b_0	52.074	3.124	0.001
Culture (C)	b_1	−77.990	−2.782	0.004
Budget emphasis (B)	b_2	−6.206	−2.189	0.015
Information asymmetry (I)	b_3	−0.994	−1.760	0.041
CxB	b_4	14.156	2.859	0.003
CxI	b_5	2.358	2.704	0.004
BxI	b_6	0.159	1.682	0.048
CxBxI	b_7	−0.433	−2.841	0.003
R^2			0.208	
F value			3.564	
$p <$			0.001	

Table 6. Results of Regression of Propensity to Create Slack on Budget Emphasis and Information Asymmetry Australian and Singaporean Subsamples.

Variable	Coeff	Australian ($n = 52$)						Singaporean ($n = 51$)					
		Est	*t*-Value (Main)	*P*	Est	*t*-Value (Two-Way)	*P*	Est	*t*-Value (Main)	*P*	Est	*t*-Value (Two-Way)	*P*
Constant	b_0	24.535	5.354	0.001	−25.916	−1.287	0.102	24.886	5.502	0.001	52.074	2.844	0.004
Budget emphasis (B)	b_1	−1.268	−2.477	0.008	7.951	2.194	0.017	−1.539	2.389	−0.010	−6.206	−1.993	0.026
Information asymmetry (I)	b_2	−0.134	1.187	−0.121	1.364	2,299	0.013	−0.060	0.524	−0.302	−0.994	−1.602	0.058
BxI	b_3				−0.274	−2.566	0.007				0.159	1.531	0.067
R^2			0.135			0.240			0.123			0.164	
Adj R^2			0.100			0.192			0.086			0.111	
F Value			3.837			5.045			3.360			3.084	
P^2			0.014			0.002			0.022			0.018	
Increase in Adj R^2						9.2%						2.5%	

To explore further the nature of the three-way interaction effect among national culture, budget emphasis and information asymmetry affecting propensity to create slack, the data are analyzed separately for the Australian and Singaporean subsamples. The results are presented in Table 6. With respect to the two-way interaction model, Table 6 indicates that for the Australian subsample, coefficient b_3 for the two-way interaction is highly significant (est $= -0.274$; $p < 0.007$) and the sign of the coefficient is negative. These results indicate that in Australia, budget emphasis interacts with information asymmetry to affect the propensity to create slack.

For the Singaporean subsample, coefficient b_3 for the same two-way interaction is also significant (est $= 0.159$, $p < 0.067$) and the sign of the coefficient is positive. Note that whilst the coefficients b_3 for the two-way interaction between budget emphasis and information asymmetry are significant for both the Australian and Singaporean subsamples, the signs differ. For Australia, coefficient b_3 is *negative* (est $= -0.274$), whereas for Singapore, it is *positive* (est $= 0.159$). To test if the two-way interaction for the Australian subsample and the Singaporean subsample are monotonic or nonmonotonic, the test suggested by Schoonhoven (1981) is used. The point of inflexion is 29 for the Australian subsample and 39 for the Singaporean subsample. As these points are within the observed range of the two subsamples, budget emphasis has a *nonmonotonic* effect on the propensity to create slack over the range of information asymmetry for both subsamples.

Further analysis is needed to interpret these results. To undertake this, both budget emphasis and information asymmetry are dichotomized at their respective means and a 2 × 2 (budget emphasis and information asymmetry) matrix is created. The related descriptive statistics for each cell are graphed in Fig. 1 for the Australian subsample, and Fig. 2 for the Singaporean subsample.

Australian Situations

Recall that we argued that *high* budgetary participation is most useful to the subordinates: (1) when information asymmetry is low because *high* budgetary participation enables the subordinates to gain information from their superiors; *or* (2) when budget emphasis is high because *high* budgetary participation enables the subordinates to influence their budget targets which are very important to them when they are evaluated by a high budget emphasis evaluative method. Superiors are also likely to be more concerned with budgetary slack and hence implement tighter controls when budget emphasis is high than when it is low. Hence, if *either* of the two conditions is present, the expectation is that the subordinates are likely

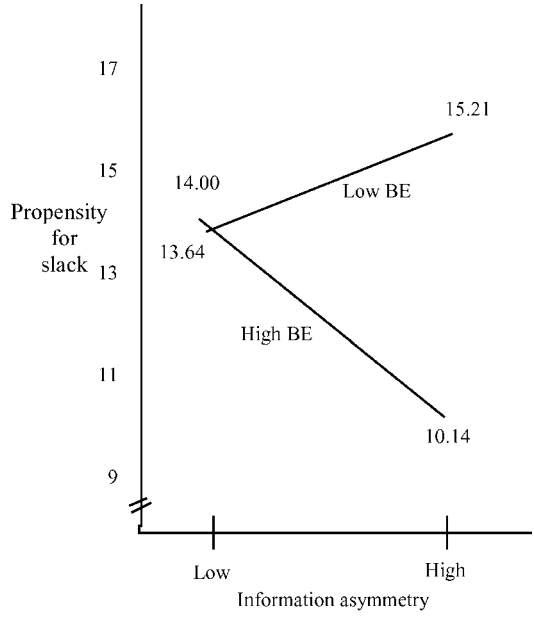

Fig. 1. Two-way Interaction Between Budget Emphasis and Information Asymmetry Affecting Propensity to Create Slack (Australian Managers Subsample, $n = 52$).

to want to preserve their high participation privileges and not jeopardize them by engaging in slack creation activities. Note that the incentive to preserve budgetary participation exists only when the subordinates are accorded *high* budgetary participation by the superiors in the first place. If the subordinates are allowed only *low* budgetary participation, the incentive to preserve participation privileges will not exist.

Hence, the above proposal that slack creation is likely to be low: (1) when budget emphasis is high; *or* (2) when information asymmetry is low, is likely to be supported for the Australian subsample because the existence of a *high* participative environment has been predicted and supported (see Hypothesis H4) for the Australian subsample. Figure 1 presents the results for the Australian subsample.

When budget emphasis is *low*, subordinates are likely to be less concerned with the levels of their budget targets. Hence, their propensity to create slack is expected to be influenced mainly by the level of information asymmetry. When information asymmetry is low, budgetary participation is needed to gain or exchange

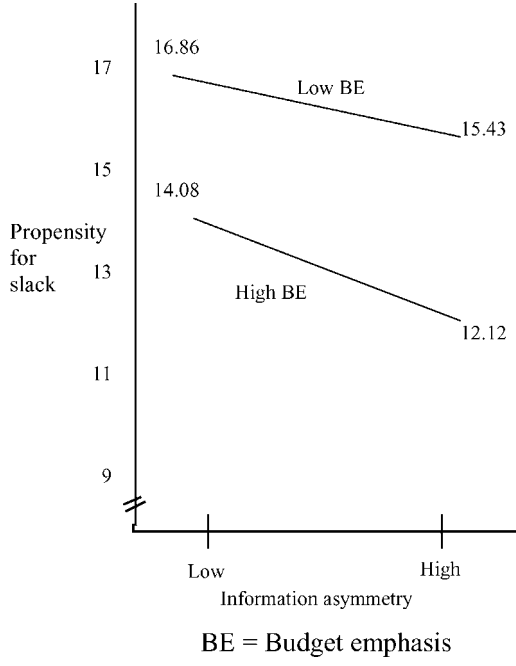

Fig. 2. Two-way Interaction Between Budget Emphasis and Information Asymmetry Affecting Propensity to Create Slack (Singaporean Managers Subsample; $n = 51$).

information with their superiors. Consequently, slack creation is expected to be lower when information asymmetry is low than when information is high. These expectations are supported by the *low* budget emphasis line in Fig. 1 that indicates that slack is lower when information is low (13.64) than when it is high (15.21).

When budget emphasis is *high*, propensity to create slack is expected to be low *regardless of the level of information asymmetry*. High budget emphasis, in itself, is sufficient to motivate the subordinate to reduce slack creation activities in order to preserve participation privileges. This expectation is supported by the *high* budget emphasis line in Fig. 1 that is generally lower than the *low* budget emphasis line except when information asymmetry is low when the levels of propensity to create slack are about the same for both lines.

Figure 1 also indicates that the slope of the *high* budget emphasis line is negative. This means that propensity to create slack is lower when information asymmetry is high (10.14) than when information asymmetry is low (14.00). This result is not surprising. As noted above, when budget emphasis is high, the subordinates will have the incentive to preserve their participation privileges and

hence will not have the inclination to create slack. Additionally, when budget emphasis is high, it is in the subordinates' interests that their budget targets are realistic and accurately determined. Unrealistic and easy targets are likely to be detected by the superiors over time. *Superiors are also likely to be much less tolerant of slack creation when a high budget emphasis evaluative style is employed* because of the distortion in performance evaluation. Since subordinates in high asymmetry situations have more private information than their superiors, they are in a good position to assist their superiors to develop more accurate and realistic budget targets as well as being fully aware that the budget targets which they assist to develop are highly accurate and realistic. Hence, there will be little need for them to harbor a high propensity to create slack. Moreover, since they possess more private information than their superiors, their superiors are likely to rely on them heavily to develop accurate budget targets. Hence, a great deal of trust and reliance may be placed on them. Participation in such situations is likely to be genuine. Under such circumstances, it seems unlikely that these subordinates will abuse their superiors' trust and exploit their private information to create slack.

In contrast, since subordinates in *low* information asymmetry situation do not have much private information, they may not have much to contribute to the development of accurate and realistic budgets. Hence, their participation in the budget setting process may not be very valuable to their superiors because the superiors already possess more information than them. Consequently, the subordinates' budgetary participation in such situations may be used by them mainly to bargain for lower budget targets. This does not mean that their propensity to create slack will be high. As argued previously, since budget emphasis is high, they will be keen to preserve their participation privileges. But compare with subordinates in the high budget emphasis-high information asymmetry situations, their propensity to create slack is expected to be higher. These expectations are supported by the high budget emphasis line in Fig. 1 that indicates that subordinates in *low* information asymmetry situations have relatively higher levels of propensity to create slack than the subordinates in *high* information asymmetry situations.

Singaporean Situations

Figure 2 presents the results of the Singaporean subsample. It indicates that the propensity to create slack is negatively associated with information asymmetry for both the low budget emphasis line and high budget emphasis line.

Recall that we predicted the existence of a *low* participatory environment in Singapore because of its high power distance culture. This expectation is supported by the results for Hypothesis H4 that indicates that the budgetary participation

scores of the Singaporean managers are significantly *lower* than those of the Australian managers. Consequently, our proposal that slack creation is likely to be low: (1) when budget emphasis is high; *or* (2) when information asymmetry is low, is *not* likely to be supported for the Singaporean subsample *because Singaporean managers in general, have less budgetary participation to preserve*. Moreover, as discussed earlier, Singaporean subordinates, with their high power distance culture, are unlikely to want high budgetary participation in the first place.

Since Singaporean subordinates in low information asymmetry situation do not have more private information than their superiors, and since they do not have the opportunity to gain information from their superiors because of the *low* participatory environment in Singapore, they are likely to harbor a higher propensity to create slack. In contrast, subordinates in high information asymmetry situation have more information than their superiors. Consequently, they are likely to be in better control and more confident of their situations. Hence, they may feel less pressure to build budgetary slack. They are therefore likely to have a lower propensity to create slack than their counterparts in low information asymmetry situations. These expectations are supported by the results in Fig. 2 that indicates that both the high and low budget emphasis lines are negatively related to information asymmetry.

Recall that we have also proposed that superiors are likely to be much less tolerant of slack creation when a high budget emphasis evaluative style is employed. When a high budget emphasis is used, budgetary slack distorts performance evaluation. Consequently, superiors, who adopt a high budget emphasis evaluative style, are likely to pay greater attention to budget targets and adopt tighter measures to discourage slack creation. Otley (1978) also suggested that superiors are likely to adopt a high budget emphasis evaluative style only in situations when budget targets can be determined accurately. Hence, propensity to create slack is likely to be lower for high budget emphasis situations than for low budget emphasis situations. These expectations are supported by the results in Fig. 2 that indicates that the high budget emphasis line is generally lower than the low budget emphasis line.

CONCLUSION

Prior studies have suggested that national culture can have an effect on management accounting systems (e.g. Chow et al., 1991; Harrison, 1992; Lau et al., 1995; O'Connor, 1995). This study therefore investigates if national culture affects propensity to create slack, and if so, the manner in which these effects occur. It proposes that national culture does not influence the subordinates' propensity to

create slack directly. Instead, a much more complex model is needed to explain how national culture affects slack.

Since there has been considerable support for the proposition that national culture may influence the extent of managers' participation in organizational affairs (Brownell, 1982a, b; Harrison, 1992; Hofstede, 1980; Lau et al., 1995), this study proposes that the effect of national culture on propensity to create slack is through its effect on budgetary participation. Since participation, *by itself*, may not have a significant effect on the subordinates' propensity to create slack (Dunk, 1993), it was necessary to ascertain the manner in which participation affects the managers' propensity to create slack. A significant three-way interaction among *budgetary participation*, budget emphasis and information asymmetry affecting propensity to create slack was found in this study. A three-way interaction model involving *national culture*, budget emphasis and information asymmetry affecting the subordinates' propensity to create slack was developed and tested. The results also support the existence of a significant three-way interaction for this model. Overall, these results provide important empirical evidence to support the models developed in this study to explain the manner in which national culture affects the subordinates' propensity to create slack.

There are important theoretical and practical implications associated with these results. With respect to theory building, this study helps to address an important omitted variable problem surrounding studies on budgetary slack creation, namely, the impact of national culture on budgetary slack creation. The inclusion of the effects of national culture in models developed to explain budgetary slack creation helps to explain if and how these variables influence slack creation activities in a cultural context. Such an understanding will assist managers in different cultural environments to select: (1) the most appropriate level of budgetary participation; and (2) the combination of budget emphasis and information asymmetry that best fits the cultural environment to minimize budgetary slack creation.

For many organizations, the choice may be limited. For instance, for organizations operating in countries with cultures that *encourage* employee participation (e.g. high power distance cultures such as Australia and USA), top management may not be able to choose how much budgetary participation they can give to their employees. They may be *forced* to adopt a policy of *high* budgetary participation so that the level of budgetary participation in their organization is in harmony with the cultural values of their employees. Since high budgetary participation is expected to prevail in low power distance cultures, organizations operating in such cultures may be able to minimize slack creation activities by selecting the most appropriate combination of *budget emphasis* and *information asymmetry* which *best fits* such cultural (high participatory) environments. In most situations, the extent of information asymmetry may also be contextual or given. This means

that the extent of the subordinates' information asymmetry may also be beyond the control of top management. Hence, top management choice of strategy may be restricted to the extent of *budget emphasis* only. Recall that our results in Fig. 1 (Australian subsample) indicate that in a high participatory culture, slack creation activities is low: (1) if information asymmetry is low; or (2) if budget emphasis is high. They also indicate that slack creation is lowest (10.14 in Fig. 1) in a high budget emphasis-high information asymmetry situation. Hence, for organizations operating in cultures that encourage *high* employee participation (e.g. low power distance cultures), top management may employ the following strategies. If information asymmetry is *high*, a high budget emphasis is preferred to a low budget emphasis. However, if information asymmetry is *low*, either a high budget emphasis or a low budget emphasis may be employed.

Even if top management's choice of budget emphasis is limited or restricted, the results of this study may still provide a useful guide as to which combinations of budget emphasis and information asymmetry in cultures which promote budgetary participation, are likely to be associated with a high level of propensity to create slack. For instance, if information asymmetry is high and a low budget emphasis *has to be employed*, top management will at least be aware that slack creation is likely to be high (15.21 in Fig. 1). Such awareness may alert top management to those situations where extra precautions and controls may be needed to counter slack creation activities. For instance, a greater adjustment to the budget targets proposed by the employees operating in a low budget emphasis-high information asymmetry situation may be needed before their budget targets can be accepted.

A similar analysis may be undertaken for the results of the Singaporean subsample (high power distance). For instance, for organizations operating in countries with cultures that *discourage* employee participation (e.g. low power distance cultures such as Singapore), top management choice of budgetary participation may be restricted because they may be *forced* to adopt a policy of *low* budgetary participation so that the level of budgetary participation in their organization is in harmony with the cultural values of their employees. Under such circumstances, top management may need to select a combination of budget emphasis and information asymmetry that is able to minimize slack creation activities when the operating environment is basically low participatory. The results in Fig. 2 (Singaporean subsample) indicate that *if a choice can be made*, a high budget emphasis is preferred to a low budget emphasis for both high and low information asymmetry situations. If the choice of budget emphasis is *not* available to top management, and a low budget emphasis *has* to be employed in either high or low information asymmetry situations, top management will at least be aware that slack creation is likely to be high. Such awareness will at least

alert top management to be cautious in accepting budgetary targets proposed by their employees.

The results of this study may also have important implications for other management accounting issues. For instance, budgetary participation has been the focus of much management accounting research and the empirical evidence has indicated that its effects on managers' behavior are pervasive. Since national culture has been proposed as an antecedent variable of participation (Brownell, 1982a; Harrison, 1992; Hofstede, 1980), and this expectation has been supported by the results of this study, there is therefore both theoretical and empirical justification to expect that the effects of national culture on management control systems and managers' behavior to be relatively similar to that of budgetary participation. This means that the effects of national culture on management control systems and managers' behavior may be far more important and pervasive than previously assumed because of the significant relationship between national culture and participation. Additional research, which investigates the relationships between national culture and other variables, such as decentralization, industrial relation systems, scope of management accounting systems and business strategy, may uncover evidence to support the expectation that national culture may indeed be a much more crucial factor in influencing the design of management accounting systems than previously assumed. This suggests the need for system designers to consider cultural differences when designing control systems in different nations or societies.

Even though strong support was found for many of the hypotheses developed, generalizing the results to other dependent variables, functional areas and cultures should be viewed with caution because, as with most research, a number of limitations exist in this study. First, this study compared only two countries. The inclusion of other countries with cultures similar to those of Australia and Singapore, respectively, is needed to verify the results of this study. Second, as the sample for this study was based on heads of the production function from manufacturing companies, the generalizability of the findings of this study are restricted to similar levels of management and types of organization. As some studies (e.g. Hayes, 1977; Thompson, 1967) have indicated that there are important differences pertaining to management control systems across different functional areas, caution is needed if results applicable to the production function are to be generalized to other functional areas. The selection of well-matched samples from different functional areas, other levels of management and other industries will help to ascertain the extent to which the results of this study have been affected by the sample of respondents selected for this study. Finally, the study may be subjected to the usual limitations associated with the survey method. For instance, the ever-present problems of errors in measurement cannot be discounted. Caution

should therefore be exercised in interpreting the results because of the possibility that the potential for biases of common method, self-presentation and leniency arising from the survey method and the measurement instruments used in our study may still occur even though the instruments used are well established.

Nevertheless, despite these limitations, this study developed and tested a model to explain the occurrence of managers' propensity to create slack across national culture. This extension of the study across national cultures allows not only national culture to be evaluated systematically, but also enables a more integrated and comprehensive propensity to create slack model to be tested. The relatively strong results enhance the credibility and robustness of the theory of this study. Finally, the substitution of national culture for budgetary participation in the model and the relatively strong results found, may have important theoretical and practical implications for the results accumulated in many past studies on many variables, which may eventually be found to be significantly related to national culture.

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REGULATIONS ON IPO PRICING, EARNINGS MANAGEMENT AND EARNINGS FORECASTS DURING THE REFORM OF STATE ENTERPRISES IN CHINA

Heidi F. W. Lau

ABSTRACT

In China, there are strict regulations on Initial Public Offering (IPO) pricing. The IPO price is the product of earning per share (EPS) and a P/E ratio predetermined by the Chinese Securities Regulatory Commission (CSRC). During the period of this study (1992–1998), the regulations on IPO pricing had been changed twice, from using the forecasted EPS to past three-year average EPS, and then changed back to the forecasted EPS. It is interesting to investigate the relationships among these changes, earnings management and earnings forecast disclosure. My findings show that using past three-year average EPS to set the IPO price may be an additional incentive for earnings management, but the evidence is not very strong. The research also investigates whether the forecasted EPS disclosed in the prospectus or public announcement can be realized under different regulations.

Advances in International Accounting
Advances in International Accounting, Volume 17, 175–198

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17009-8

INTRODUCTION

IPO (initial public offering) is an important means for the reform of state enterprises as well as capital allocation in the People's Republic of China. The regulations related to IPO pricing change twice from 1997 to 1999. This paper investigates whether the setting of IPO price has an impact on the incentives for earnings management and on the earnings forecast made by the company. The literature documents that IPO firm's financial performance declines subsequent to IPO (Jain & Kini, 1994; Teoh et al., 1998). It is also true for Chinese firms issuing shares to foreigners (B share). Aharony et al. (2000) document that median return of assets (ROA) of Chinese B-share firms peaks in the IPO year and declines thereafter. Lin and Wei (2000) observe that during the 1992–1995 period the reported earnings of A-share firms peak one or two years before the IPO year, while in the IPO year the earnings significantly decline instead of rising or dropping slightly. It is interesting to know whether this is also true for Chinese firms for a longer horizon and whether this is the result of accrual reversal or due to other reasons.[1] In addition, the regulations related to IPO pricing will be investigated in order to supply an answer to a firm's incentives for earnings management, whether it is through accrual management or through non-operating income. Since firms use forecasted EPS to set IPO prices before 1997 and after March 1998, it is also interesting to know whether the firms can meet their earnings forecast and the direction of forecast error during these periods.

PAST AND FUTURE OF STATE-OWNED ENTERPRISES (SOEs)

Apart from financial considerations, the appearance of the SOEs was undoubtedly a historical issue related to social and political environment. Historically, the Chinese communist party has made use of state *danwei* (the authority for state enterprises) as the political base for party control. The sweeping post-Mao reform has significantly transformed the environment in which state enterprises are run. In a way, fast growing capitalism in China has made it difficult for the traditional state enterprises to adapt to the change. To a large extent the market forces undermined the authority of central planning, eroded state ownership and caused conflicts between the government and state enterprises.

Deng Xiao-ping, with the regain of his influence on the political scene in China in the late 1970s, concerned over poor management and defects in the political

system, hastened the step of reformation of state enterprises by phasing out the party command system in them. The reform since 1979 can be roughly divided into three phases: 1978–1990, 1990–1999, and 1999 and thereafter.

FIRST PHASE (1978–1990): CONTRACT RESPONSIBILITY SYSTEM

The State Enterprise Law was drafted in early 1978 to institutionalize factory management. Despite the State Council rejected this draft law in September 1978, experiments with the contract responsibility system were carried out in Beijing, Shengyang and Anshan. Management was granted more power, and trade unions were restored after having been done away with in the Cultural Revolution.

During this phase, experiments on the profit retention system and source of capital have been carried out. In some SOEs, managers took full responsibility for profits and losses with profit quota set. Any profit that exceeded the quota was to be retained in full or in a pre-determined percentage by the enterprises. This experiment of submission of profits was replaced by the payment of tax and charges for fixed capital and working capital in 1981. In 1983, the charges paid by the SOEs were unified and became an income tax. In 1985, the SOEs' capital investment was changed from interest-free state appropriations to bank loans with interest charges (*bo gai dai*).

With these experiments in place, however, the fundamental ownership problem remained and more severe agency problems might emerge in the short-term contracting environment (Wang, 1997).

SECOND PHASE (1990–1999): CORPORATIZATION

The 1989 Tiananmen incident has slowed down the tempo with which party functions were being reduced in state firms for one or two years. Deng then urged that reform should go further during his south China tour in 1992. A clearer separation of ownership and management of state enterprises was manifested in the party's announcement that the key word state-run enterprises (*guoying qiye*), which connotes the nature of the state/enterprise relationship as one where the former directly runs the latter, would be replaced by state-owned enterprises (*guoyou qiye*). In 1995, the so-called "focusing on large and medium-sized

firms and letting go small ones" (*zhuada fangxiao*) strategy was launched. Large enterprises were corporatized while small ones were privatized. Many large enterprises will be turned into share capital enterprises (SCEs) where boards of directors dominate at the expense of party secretaries, and the shares are traded in the stock market established in Shanghai and Shenzhen in 1990 and 1991 respectively. Such corporatization through the stock market is a step forward from the contract reforms in terms of transferring property rights between the state and factories.

Having said that though, the Chinese government has placed restrictions on share ownership by classifying the shares into state (*guo jia gu*), corporate (*fa ren gu*), individual shares and foreign-owned shares, composition of management has seen few significant changes. As a result of this, the management of SCEs is still under the influence of the central or municipal government and is not monitored by the board of directors or majority shareholders as in the West.

THIRD PHASE (1999 AND ONWARDS): DEBT-EQUITY SWAP

The PRC government has stopped nearly all subsidies to the SOEs. Since they have had to shoulder the nation's social welfare burden, state enterprises have gone to the bank financing as a source of capital in addition to stock market. Bank financing, however, ran under a preference system and consequently the banks could not recoup the bulk of their loans to the SOEs, putting the integrity of banking system at risk.

Facing the indebtedness problem that cannot be alleviated by bankruptcy and mergers, the Chinese Government plans to convert non-performing bank loans into equity. Asset management companies (AMCs) would start converting non-performing enterprise loans owed to China's big four state commercial banks into equity in the SOEs. As shareholders, AMCs participated in the management of the enterprises and aims to eventually either returning the equity to the enterprises or listing them in the stock market. Whether the trouble-debt restructuring can be successful is still waiting to be seen.

Notwithstanding the different stages of reform, the process of corporatization is still the demarcation line leading to the evolution of SOEs. Prior studies in the U.S. argue that incentives for earnings management exist and document a decline in post-issue performance of IPO firms (Jain & Kini, 1994; Teoh et al., 1998). This paper will try to revisit the same issue in PRC by focusing on the regulation on IPO pricing and its effect on the earnings management incentives and earnings forecast disclosed in the prospectus.

NEW ISSUE PROCESS AND EVOLUTION OF REGULATIONS ON IPO PRICING

SOEs in China are listed on stock exchanges primarily for the purpose of raising capital for investment. The aggregate value of new shares to be issued each year is a part of the national investment, and there is a new share issue quota (pei e) for A shares. The quota refers to the limit of the dollar amount of shares that are approved by the government to be issued to private investors. The quota is allocated by province as well as by independent municipalities. The criteria used for allocation among provinces appear to reflect a balance between balanced regional dispersion for distributional objectives, and a recognition of wide regional differences in the production structure and enterprise base. Within each regional quota, the local securities authority invites enterprises to apply for a listing, and makes a selection based on criteria that combine good historical performance, as well as industrial development objectives.

As regulated by the Company Law, when the enterprises are reorganized into listed companies, the shares subscribed by the initiator, i.e. direct state-owned shares, should not be less than 35% of the total shares. It is also regulated that the private shares subscribed by individual shareholders through securities market should be more than 25% of the total shares of the company. In other words, the lower and the upper limits of private shares should be 25% and 65% of the total shares. In addition, enterprises applying for listing must have a debt ratio (total liability/total assets) lower than 70%. The Company Law regulates that "the amount of paid-in capital in the forms of industrial property rights and non-patented technology shall not exceed 20% of the registered capital of a company." The industrial property rights and non-patented technology are intangible assets. The right to use land is not included in this 20% limit.

Apart from the quota consideration, the to be listed firm must be profitable in the past three consecutive years. The share-conversion ratio should not be less than 1 : 0.65. The share-conversion ratio here refers to the ratio of amount of net assets owned by the company before it's listing to the amount of shares issued. As it is regulated in the accounting system for stock-holding companies that the par value of each share is one yuan and selling stock at a price below the par value is prohibited. A company originally has 15,385 million yuan of net assets should have at least 10,000 million public shares. Coupled with the quota assigned to the particular company, the IPO price must be at least 1 yuan per share and lower than the quota assigned divided by 10,000 million. At the early stage of the establishment of listed companies, the stock was usually underpriced and sold to individuals or entities related to the company. This restriction is to protect the interests of the State. On the other hand, the IPO price is also related to the product of EPS and P/E

Table 1. Time Frame of Different IPO Pricing Regulations.

Period	Time Frame	Restriction on EPS	Restriction on P/E
Period 1	Before 1997	Forecasted EPS	Up to 15 times[d]
Period 2[a]	Jan. 1997 to Aug. 1997	Past three-year average	Up to 20 times
Skip[b]	Sept. 1997 to Feb. 1998	70% × Past year EPS + 30% × Forecasted EPS	Normally 13–15 times[e]
Period 3[c]	Mar. 1998 to Feb. 1999	Forecasted earnings/weighted average no. of shares outstanding	Normally 13–15 times[e]
Skip[c]	Since Mar. 1999	Forecasted earnings/weighted average no. of shares outstanding	No clear-cut restriction[f]

[a] CSRC Notice, December 26, 1996 clearly stated that all new issues in 1996 should use the past three-year average EPS to determine the IPO price. Since this notice issued in December 26, most IPO firms in 1996 still use the old regulations.

[b] Firms listed in this period are excluded because it is hard to differentiate between the effect of using past EPS and forecasted EPS.

[c] The sample used in this paper is up to those listed at the end 1998, therefore, the sample in period 3 is small relatively to other two periods. Those listed from January 1999 is excluded because of data availability at the time of research.

[d] There is still some small deviation from the restriction. For example, the firm #600701 listed in May 1996, used the 16.66 as its P/E to determine the IPO price.

[e] The formula to determine P/E ratio (CSRC Notice, September 10, 1997) is: P/E = maximum of permissible P/E – (maximum of 30-day closing average of all sectors – 30-day closing average of IPO firm's sector) × adjustment coefficient + correction value, where adjustment coefficient = (maximum of permissible P/E – minimum of permissible P/E)/(maximum of 30-day closing average of all sectors – minimum of 30-day closing average of all sectors) and correction value is determined by the authority.

[f] The IPO price should refer to the related industry analysis, the prospectus of the company, average P/E ratios in current 15 and 30 trading days in Shenzhen and Shanghai Stock Exchange and etc. (CSRC Notice, March 9, 1999).

ratio. The P/E ratio for each new issue is determined in line with market conditions and standards in the same industry, and controlled by the CSRC through auditing. It is normally within a certain range. The restrictions on IPO prices changed from time to time. Table 1 illustrates the evolution of the related regulations.

This paper will also look at the impact of these regulations on the incentives for earnings management of the IPO firms in the PRC.

SPECIAL FEATURES OF EARNINGS FORECASTS MADE BY IPO FIRMS IN CHINA

Unlike some other countries, China requires new issuers to make earnings forecasts. Chinese Securities Regulatory Commission (CSRC) is the governing

body for the policy making on market operations as well as on information disclosures for the Chinese security market. CSRC has promulgated "Information Requirement and Format of Disclosure on Public Listing Company (Trial)" No. 1–6 on January 10, 1994 (known as IRFD); amended No. 1 of IRFD (The Content and Format of Prospectus) on January 6, 1997; and issued "The Content and Format of Public Announcement" as No. 7 of IRFD. The No. 1 and No. 7 of IRFD became effective on April 1, 1997. On December 26, 1996, CSRC issued a circular on "Certain Rules concerning Share Offering." The rules and regulations as stipulated in these governing documents have the following characteristics related to earnings forecast (Xu, 1997):

(1) It is mandatory to disclose earnings forecast in the Prospectus and Public Announcement.
(2) The disclosure of earnings forecast together with other information is in the Prospectus and Public Announcement. This information is not to be publicly announced separately.
(3) The to-be-listed company is not required to make disclosure about earnings forecast for the next year.
(4) The issuing company is required to disclose earnings forecast for the same financial year if the IPO is made during the first half of a year; and to disclose earnings forecast for a period of time from the time of making the forecast until the end of the next financial year if the IPO is made during the second half of a year – the period of time cannot be less than 12 months.
(5) The disclosed earnings forecast should have been audited by a certified public accountant (CPA). The CPA should assess the earnings forecast upon whether the assumption made is reasonable, whether the raw data employed is authentic, and whether the accounting policy used in making the earnings forecast is consistent with that stated in the prospectus.
(6) There are differences in the content required and the format dictated as stipulated in the trial IRFD, No. 1 and the formal IRFD, No. 1. The trial IRFD requires to tabulate earnings forecast, with a similar format to the income statement. Apart from the normal profit and loss items, the trial IRFD also requires to state the forecasted earnings per share and the forecasted P/E ratio. The formal IRFD requires to disclose the forecasted total net profit, earnings per share, P/E ratio and net asset per share. It also requires to state the tax rate. If the issuer has subsidiaries, they are also required to issue the consolidated earnings forecast.
(7) The trial IRFD requires the issuing company to explain the significant deviation from the forecast after the end of the financial year in forecast. Significant deviation means the actual earnings from the principal operating activities is

50% more than or 20% less than the forecasted figure. Notwithstanding the Chinese Independent Auditing Practice Statement No. 4 – Audit of Profit Estimates provides that the reasonable preparation and full disclosure of profit estimates are the responsibility of management, and the auditor is responsible for the trueness and lawfulness of the audit report on the estimates, the actual IRFD is more stringent. If the actual earnings is less than the forecasted earnings by 10 to 20%, the issuer and its employed CPA have to publicly apologize in designated newspapers. If the actual earnings is less than the forecasted profit by 20%, apart from the public apology, CSRC will carry out investigation and punish the issuer and the CPA accordingly. A typical example is the so-called "ST Gongguang" case (600083). Chengdu Fortune Science and Technology Co. Ltd. announced the forecasted EPS for 1997 to be 0.3063 when listed in 1997. However, the actual EPS for 1997 was –0.863 as shown in its annual report. It is the first case for newly listed companies to show loss for less than one year after listing. In October 1998, the CSRC accused the firm of understating loss in order to get listing and the twelve directors of misrepresentation in prospectus, interim report and annual report. The firm was fined 1,000,000 Yuan and the responsible management director, chief executive officer and chief financial officer will no longer be allowed to act as senior management positions of listed companies or securities trading firms. In July, 2000, the CSRC denounced eleven listed firms for announcing forecasted earnings that are more than 20% different from actual earnings.

DATA AND HYPOTHESES

Data are collected mainly from the December 1999 version of Taiwan Economic Journal (TEJ), and supplemented by China Info Bank, WIND and various publications in China, such as company reports, handbook for listed companies as well as information provided in the website (www.genius.com.cn). All non-finance firms that have A shares listed from 1992 to 1998 on the Shenzhen and Shanghai Stock Exchanges are included. Companies listed before 1992 are excluded because the listings took place in the early stage of stock market and the number of listing is relatively small (see Table 2). Actually, the Ministry of Finance (MoF) promulgated the Accounting Regulation for the Experimental Shareholding Companies and the Enterprise Accounting Standard in 1992. Before that, China basically followed the uniform accounting system. Accounting only acted as a tool for formulating and implementing national economic plans, rather than serving the investor's information need.

Table 2. Number of Listed Companies and Market Capitalization in Shenzhen and Shanghai Stock Exchanges.

Year	Shenzhen Stock Exchange		Shanghai Stock Exchange	
	Number of Listed Companies	Market Capitalisation (Billion Yuan)	Number of Listed Companies	Market Capitalisation (Billion Yuan)
1990			7	1.3
1991	6	8.1	7	2.8
1992	24	45.8	27	48.1
1993	77	125.1	97	208.6
1994	120	102.7	170	247.4
1995	135	86.6	186	242.5
1996	237	409.4	284	532.7
1997	362	821.7	381	824.0
1998	414	870.7	438	1,051.9

Source: Taiwan Economic Journal, December 1999.

Meanwhile, 65 and 38 listed firms from the Shenzhen and Shanghai Stock Exchanges respectively are dropped out because of missing data of some important variables I need in this study. I need at least two firm-year data for each firm in between four years prior to and three years after its IPO. As a result, 343 and 393 firms from the Shenzhen and Shanghai Stock Exchanges are included in this study (see Table 3).

The incentives and motivations for earnings management in China are mainly due to the accounting environment and the securities regulatory requirements. Empirical results from Jones (1998) suggest that discretionary current accruals provide a more accurate measure of earnings management than discretionary total accruals. She found that the estimated abnormal portion of non-current accruals was significantly positively correlated and thus less likely to reflect year-specific discretion. Chen and Yuan (2000) shows that earnings management is often achieved by transactions not related to core business, rather than the subtle accounting accruals in China. Therefore, earnings management for the purpose of this study broadly includes current accruals and non-operating income management. Prior studies find that managers manipulate the timing and magnitude of accruals for various reasons. Following this line of thought, I examine whether managers of SOEs engage in current accruals management in response to IPO. The first hypothesis is:

H_1. The magnitude of current accruals (scaled by lagged total assets) is higher in the pre-IPO years than in the post-IPO years.

Table 3. Sample Data from Different Stock Exchanges.

	Stock Exchange	
	Shenzhen Number of Listed Companies in Sample	Shanghai Number of Listed Companies in Sample
Panel A: Classification by listing year		
1992	18	13
1993	46	71
1994	37	63
1995	7	14
1996	96	102
1997	99	83
1998	40	47
Total	343	393
Panel B: Classification by industry		
Manufacturing	222	235
Commerce	36	48
Utilities	16	29
Real estate	16	7
Consolidated enterprises	53	74
Total	343	393

Sources: Taiwan Economic Journal, December 1999. www.genius.com.cn and Securities Market Weekly Year Book 99.

The computation of current accruals (CA) is consistent with the accounting literature (e.g. Teoh et al., 1998) and is as follows:

$$\mathrm{CA}_t = (\Delta\text{Current Assets} - \Delta\text{Cash}) - (\Delta\text{Current Liabilities} - \Delta\text{Current Portion of Long-Term Debt})$$

Where the change (Δ) is computed between time t and $t-1$.

Using this formula not only reduces the influence of nonstandard classifications of certain items, but also avoids using depreciation data that is not required to be disclosed before 1996.

A regression analysis using modified Jones model is run as follows:

$$\mathrm{CA}_{it} = \alpha + \beta_1 \mathrm{IPOCO}_{it} + \beta_2 \Delta\mathrm{REV}_{it} + \sum \beta_t Y_{it} + \varepsilon_{it} \quad (1)$$

where

t = year indicator (90–98)
i = company indicator (1 to N)
CA_{it} = company i's current accruals in year t scaled by lagged total assets
$\Delta\mathrm{REV}_{it}$ = change of revenue of company i between period t and $t-1$, scaled by lagged total assets
IPOCO_{it} = dummy variable that equals 1 for pre-IPO company-years and 0 otherwise, where pre-IPO company-years includes two or one year prior to IPO and the IPO year
Y_{it} = year dummy variable that equals 1 for year t (t = 90 to 98) and 0 otherwise, which covers two years prior to IPO, IPO year and three years thereafter
ε_{it} = a random error term.

I have not distinguished the current accruals into discretionary (DCA) and non-discretionary (NDCA) elements with the assumption that NDCA fluctuates randomly and will be left as an error term in the above model. As in prior studies, the change in revenue is included to control for changes in nondiscretionary accruals caused by changing economic conditions. The year dummy also serves the similar purpose. The coefficient for ΔREV is expected to be positive because changes in working capital accounts such as accounts receivable, inventory and accounts payable are part of current accruals and are positively related to changes in revenue. I want to test whether the coefficients of IPOCO_{it} are positively significant.

The regulatory requirements may influence the managers' decision of engaging in earnings management. The impact may be multi-directional. On the one hand, managers may want to lower the IPO price in order to earn the windfall shortly after the IPO or signal the firm's quality and recover the costs of underpricing when they go back to the market with seasoned equity offerings. On the other hand, managers may want to increase the IPO price in order to meet the financing need. Basing on the literature (Su & Fleisher, 1999), the signaling hypothesis is dominated. The past earnings are used as the reference points to estimate IPO prices for the period from January 1997 to August 1997.[2] Therefore, it is interesting to test the following second hypothesis:

> **$\mathbf{H_2}$.** The difference in current accruals (scaled by lagged total assets) observed from testing H_1 is higher for firms listed in Period 2 (from January 1997 to August 1997) than for those listed in Period 1 (before January 1997) or Period 3 (after March 1998).

This can be done by segmenting the samples into three groups, and use those data listed between the period from January 1997 to August 1997 as the data from

Period 2, those before January 1997 as the Period 1 and after March 1998 as the Period 3. Chinese companies listed in between September 1997 and February 1998 are excluded as the regulation used the mixture of past year EPS and forecasted EPS.

Prior studies find that managers manipulate the timing and magnitude of non-operating income, or so-called below-the-line items. I examine whether Chinese managers engage in such transactions for IPO purposes.

H_3. The magnitude of non-operating income (scaled by lagged total assets) is higher in the pre-IPO years than in the post-IPO years.

A regression analysis is as follows:

$$\mathrm{NOI}_{it} = \alpha + \beta_1 \mathrm{IPOCO}_{it} + \beta_2 \Delta \mathrm{REV}_{it} + \sum \beta_t Y_{it} + \varepsilon_{it} \qquad (2)$$

where

NOI_{it} = non-operating income, scaled by lagged total assets
t = year indicator (90, . . ., 98)
i = company indicator (1, . . ., N)
IPOCO_{it} = dummy variable that equals 1 for pre-IPO company-years and 0 otherwise, where pre-IPO company-years includes two or one year prior to IPO and the IPO year
Y_{it} = year dummy variable that equals 1 for year t (t = 90, . . ., 98) and 0 otherwise, which covers two years prior to IPO, IPO year and three years thereafter
ε_{it} = a random error term.

H_4. The difference in non-operating income (scaled by lagged total assets) observed from testing H_3 is higher for firms listed in Period 2 (from January 1997 to August 1997) than for those listed in Period 1 (before January 1997) or Period 3 (after March 1998).

The methodology is similar to that uses for H_2 and the samples are divided into three groups based on different periods. Again, the companies listed in between September 1997 and February 1998 are excluded.

This is my basic assumption when conducting the research about the forecast earnings, i.e. the forecasted EPS is a linear combination of the past three years EPS. It is interesting to know whether the forecast made in the prospectus can be realized. Such finding may further provide insights to whether using forecasted EPS to set IPO price is reasonable or superficial.

Many studies have examined the reliability of IPO forecasts (e.g. Chan et al., 1996; Chen & Firth, 1999; Firth & Smith, 1992). Accuracy of prospectus earnings forecasts (PEF) is measured by forecast errors, absolute forecast errors and squared forecast errors. The results are inconclusive. Firth and Smith (1992) find

that forecast errors are unrelated to the stock price premium upon listing for 89 profits forecasts contained in prospectuses of companies newly listing on the New Zealand Stock Exchange in the 1983–1986 period. The results of Chan et al. (1996) indicate that PEF accuracy in Hong Kong tends to increase if the past profit variability is lower, the change in economic conditions is smaller, and the company's listing is more recent. Previous research have identified the following potential determinants of profit forecast accuracy: (i) forecast horizon; (ii) company size; (iii) financial leverage; (iv) past profit variability; (v) general economic conditions prevailing at the time the prospectus is issued; (vi) reporting accountant; (vii) industrial classification; (viii) year of flotation; (ix) issuing house; (x) type of issue; and (xi) the extent to which company directors "manage" profits through their internal decision. Chen and Firth (1999) find that profit forecasts in prospectus are moderately accurate and that they are better than time-series extrapolations of historical profits for Chinese IPO firms from 1991 to 1996. Furthermore, findings also reveal that profit forecasts are related to company valuations and that investors predict the sign and, to some degree, the magnitude of forecast errors. Xu (1997) reports a model for the absolute forecast error (AFE) using Shanghai Stock Exchange IPO firms. AFE is a function of log total assets (LogTA), IPO price (IPOprice) and the percentage of core operating profit to total profit (Core%). The regression result is:

$$\text{AFE} = -0.573 + 0.091\text{LogTA} + 0.029\text{IPOprice} - 0.554\ \text{Core\%}$$

I would like to introduce the effect of IPO regulations into the model as follow:

$$\begin{aligned} f\text{EPS}_i = {} & \alpha + \beta_1 p\text{EPS}_i + \beta_2 \text{LogTA}_i + \beta_3 \text{IPOprice}_i + \beta_4 \text{Core\%}_i \\ & + \beta_5 \text{Horizoni} + \beta_6 \text{Pdummy1}_i \times \text{IPOprice}_i + \beta_7 \text{Pdummy2}_i \\ & \times \text{IPOpric}_i + \beta_8 \text{Pdummy3}_i \times \text{IPOprice}_i + \sum \beta_t Y_{it} + \varepsilon_i \end{aligned} \tag{3}$$

where

i	= company indicator (1, . . ., N)
$p\text{EPS}_i$	= the mean of past three years EPS
$f\text{EPS}_i$	= forecasted EPS in the IPO year
logTA_i	= log total assets
IPOprice_i	= IPO price
$\text{Core\%}_i$	= the percentage of core operating profit to total profit
Horizon_i	= number of month between the date of forecasting and December
Pdummy1_i	= 1 if IPO happened in Period 1 and 0 otherwise
Pdummy2_i	= 1 if IPO happened in Period 2 and 0 otherwise
Pdummy3_i	= 1 if IPO happened in Period 3 and 0 otherwise
Y_{it}	= a year dummy variable that equals1 if IPO year is t and 0 otherwise, which covers 92–98.

The fifth hypothesis is:

H_5. The magnitude of forecasted EPS is lower for firms listed in Period 2 (from January 1997 to August 1997) than those listed in Period 1 (before January 1997) or Period 3 (after March 1998).

LogTA_i is the proxy for company size while Y_{it} is the proxy for both general economic conditions and year of flotation. Past profit variability are not included because long time series of history profit are not available. Type of issue is irrelevant for this study as all issues are A shares with par value of one yuan. In order to simplify the model, reporting accountant, issuing house and industrial classification that are mostly not significant in the past studies are not considered here. I conjecture that the coefficients for dummy1 and dummy3 are positive.

Bias of the earnings forecast is important in this research. The IPO firms have more incentives to overestimate the forecasted EPS in Period 1 or 3 because they want to raise more external capital. Results are mixed in the literature of bias in management earnings forecasts (MEF). McNichols (1989) finds evidence that MEF are, on average, unbiased. Choi and Ziebart (2000) report that short-term MEF are pessimistically biased while long-term MEF are optimistically biased. However, PEF in this research may be optimistically biased in Period 1 or 3.

I measure bias using the difference between the forecasted EPS published in prospectuses or public announcements and the actual *ex post* earnings per share published in the annual report. A positive (negative) value implies an optimistic (pessimistic) bias for the forecast. To assess the extend to which the results are robust, the difference is also scaled by the book value of equity and the total asset.

The sixth hypothesis is:

H_6. Firms listed in Period 1 or 3 (before 1997/after March 1998) are more optimistically biased in making earnings forecast than firms listed in Period 2.

The seventh hypothesis is to test whether the higher forecasted EPS is achievable, i.e. the accuracy of the forecast.

H_7. The PFE (Prospectus Forecast Error) is lower for firms listed in Period 2 (from January 1997 to August 1997) than those listed in Period 1 (before January 1997) or Period 3 (after March 1998).

The model is:

$$\begin{aligned}\text{PFE}_i = {} & \alpha + \beta_1 \text{LogTA}_i + \beta_2 \text{IPOprice}_i + \beta_3 \text{Core\%}_i + \beta_4 \text{Horizon}_i \\ & + \beta_5 \text{Pdummy1}_i \times \text{IPOprice}_i + \beta_6 \text{Pdummy2}_i \times \text{IPOprice}_i \\ & + \beta_7 \text{Pdummy3}_i \times \text{IPOprice}_i + \sum \beta_t Y_{it} + \varepsilon_i \end{aligned} \tag{4}$$

where

i = company indicator $(1, \ldots, N)$
PFE_i = $f\text{EPS}_i - a\text{EPS}_i$ (forecasted EPS_i – Actual EPS_i)
logTA_i = log of total assets
IPOprice_i = IPO price
$\text{Core}\%_i$ = the percentage of core operating profit to total profit
Horizon_i = number of month between the date of forecasting and December
Pdummy1_i = 1 if IPO happened in Period 1 and 0 otherwise
Pdummy2_i = 1 if IPO happened in Period 2 and 0 otherwise
Pdummy3_i = 1 if IPO happened in Period 3 and 0 otherwise
Y_{it} = a year dummy variable that equals1 if IPO year is t and 0 otherwise, which covers 92–98.

I conjecture that the coefficients for Pdummy1 × IPOprice and Pdummy3 × IPOprice are positive.

EMPIRICAL RESULTS

Table 4 summarizes the descriptive statistics of A shares listed on individual exchanges. Although the scale in terms of total assets, net sales, net income, operating income and non-operating income is bigger in Shanghai Stock Exchange, I do not find out any different patterns for the two exchanges.

Table 5 reports regression results for Eq. (1) to examine whether Chinese managers engage in managing current accruals for IPO purposes. I have excluded data with current accruals of the highest 5% and the lowest 5% in my sample. The results from the reduced sample and the total sample are more or less the same. For the whole sample, the coefficient of IPO dummy is significantly positive. The same empirical result holds for all periods except for the Period 3. The result of the Period 3 may be biased because my data set is only up to 1999. The number of post IPO data is very small. The coefficient of ΔREV which is expected to be positive for all samples is in fact marginally negatively significant for the whole sample and Period 1. This may be an indicator that the managers of IPO firms try to delay or understate expenses instead of overstating the revenue in order to manage earnings.

Table 6 reports regression results for Eq. (2) to examine whether Chinese managers engage in managing non-operating income for IPO purposes. The coefficient of IPO dummy is positively significant for the whole sample and for the Period 2. It indicates that firms tend to have more non-operating income in the pre-IPO years when the past three-year average EPS is used to set the IPO

Table 4. Descriptive Statistics of Financial Attributes of the Sample of A Shares Listed on Shenzhen and Shanghai Stock Exchanges (Millions of Yuan).

	EPS (%)	Total Assets	Net Sales	Net Income	Operating Income	Non-Operating Income
Panel A: Shenzhen stock exchange (343 firms, 2,408 firm-years)						
Median	0.32	451.69	237.92	31.36	31.16	1.91
Mean	0.38	756.40	496.85	51.23	57.67	7.35
S.D.	0.38	1178.92	885.81	74.87	97.75	19.34
Min	−1.60	19.01	−30.82	−333.93	−302.69	−142.11
Max	8.41	15,649.21	9,221.77	742.62	1,107.54	104.44
N	1,432	1,679	1,771	1,716	1,705	1,632
Panel B: Shanghai stock exchange (393 firms, 2,751 firm-years)						
Median	0.32	420.91	263.40	30.30	31.22	2.66
Mean	0.36	871.22	581.50	56.56	64.40	9.56
S.D.	0.33	1,883.46	1,065.45	119.98	150.12	36.58
Min	−2.54	3.27	0	−632.44	−526.43	−579.15
Max	3.63	27,032.82	12,295.82	2,126.80	2,635.63	624.20
N	1,513	1,851	1,918	1,827	1,803	1,757
Panel C: Both stock exchanges (736 firms, 5,159 firm-years)						
Median	0.32	432.98	252.14	30.62	31.21	2.29
Mean	0.37	816.60	540.87	53.98	61.13	8.49
S.D.	0.36	1,588.65	984.09	100.71	127.41	29.58
Min	−2.54	3.27	−30.82	−632.44	−525.43	−579.15
Max	8.41	27,032.82	12,295.82	2,126.80	2,635.63	624.20
N	2,945	3,530	3,689	3,543	3,508	3,389

price, as compared to the firms using forecasted EPS to set the IPO price. The result is consistent with that of Chen and Yuan (2000) that argue that Chinese firms tend to use non-operating income to manage earnings. The IPO dummy is marginally significant and not significant for the Periods 1 and 3 respectively. It may suggest that there is stronger incentive to use non-operating income to boost up earnings in the Period 2 when past three years earnings are used to set the IPO price.

Basically the null Hypotheses 1 and 3 were rejected basing on the result in Tables 5 and 6. In order to test whether the result is robust, I compare three different earnings management measures in the IPO year ($t = 0$) with those in two preceding years ($t = -1, -2$) and two subsequent years ($t = 1, 2$), namely net income, current accruals and non-operating income. I assume a random walk model and compute the changes of these three measures with the data of the

Table 5. Regression Results for Current Accruals for Whole Sample and Individual Groups Classified by Different IPO Periods (Top 5% and Bottom 5% Truncated).

Model 1: $CA_{it} = \alpha + \beta_1 IPOCO_{it} + \beta_2 \Delta REV_{it} + \sum \beta_t Y_{it} + \varepsilon_{it}$

	Whole Sample Coefficient (*t*-Value)	Period 1 Coefficient (*t*-Value)	Period 2 Coefficient (*t*-Value)	Period 3 Coefficient (*t*-Value)
Intercept	−0.006 (−0.191)	0.038 (4.019)**	0.012 (0.334)	0.050 (0.999)
$IPOCO_{it}$	0.035 (6.021)**	0.029 (3.413)**	0.111 (2.878)**	0.063 (1.224)
ΔREV_{it}	−0.029 (−1.975)*	−0.048 (−2.503)*	0.036 (1.282)	−0.006 (−0.122)
Y_{90}	−0.038 (−0.587)	−0.073 (−1.215)	–	–
Y_{91}	−0.001 (−0.026)	−0.035 (−1.332)	–	–
Y_{92}	0.090 (2.489)**	0.057 (2.389)*	–	–
Y_{93}	0.066 (2.030)*	0.031 (1.798)	–	–
Y_{94}	0.008 (0.256)	−0.031 (−2.422)*	−0.085 (−3.005)**	–
Y_{95}	−0.002 (−0.069)	−0.038 (−3.201)**	−0.113 (−7.146)**	0.052 (0.716)
Y_{96}	0.019 (0.636)	−0.002 (−0.122)	−0.094 (−6.212)**	−0.080 (−4.116)**
Y_{97}	0.055 (1.801)	−0.002 (−0.117)	–	−0.069 (−3.629)**
Y_{98}	0.047 (1.566)	–	0.026 (0.679)	–
Adjusted R^2	0.0558	0.0489	0.1147	0.0931
N	1,975	1,220	464	176

Note: Period 1 – IPO before 1997 (from January 1992 to December 1996).
Period 2 – IPO in between January 1997 and August 1997.
Period 3 – IPO since March 1998 (from March 1998 to December 1998).
*Significant at 5% level.
**Significant at 1% level.

previous year. In panel A of Table 7, it seems that firms consistently maintain an increasing net income prior to and after the IPO. It is consistent with the belief that firms try to open up the opportunity of further right issues even after the IPO. In panel B and C, current accruals reverted after the IPO year but it is not that significant for non-operating income. The increasing trend of non-operating income is much more significant than that of current accruals. It is again in line with the result of Chen and Yuan (2000). They suggest that earnings management is often achieved by transactions not related to core business, rather than the subtle accounting accruals in China. The Period 2 firms may consistently have higher amount of non-operating income in the past three years so that the changes are not significant in year −2 and −1. I do not find out any significant different pattern for different groups in Table 7 except for the IPO year when the increases in current accruals are much higher in the Period 2 than the Period 1.

Table 6. Regression Results for Non-Operating income for Whole Sample and Individual Groups Classified by Different IPO Periods (Top 5% and Bottom 5% Truncated).

Model 2: $NOI_{it} = \alpha + \beta_1 IPOCO_{it} + \beta_2 \Delta REV_{it} + \sum \beta_t Y_{it} + \varepsilon_{it}$

	Whole Sample Coefficient (t-Value)	Period 1 Coefficient (t-Value)	Period 2 Coefficient (t-Value)	Period 3 Coefficient (t-Value)
Intercept	0.003 (1.336)	0.003 (2.652)**	0.00002 (0.007)	0.005 (1.887)
$IPOCO_{it}$	0.002 (2.860)**	0.002 (2.278)*	0.009 (2.591)**	0.003 (0.806)
Y_{90}	−0.001 (−0.181)	−0.001 (−0.190)	–	–
Y_{91}	−0.005 (−1.623)	−0.005 (−2.172)*	–	–
Y_{92}	0.001 (0.429)	0.001 (0.561)	–	–
Y_{93}	0.004 (1.365)	0.004 (1.963)*	–	–
Y_{94}	0.002 (0.771)	0.003 (1.707)	−0.007 (−2.907)**	–
Y_{95}	−0.003 (−1.146)	−0.003 (–1.974)*	−0.007 (−4.297)**	−0.002 (−0.348)
Y_{96}	0.001 (0.574)	0.005 (3.168)**	−0.006 (−3.640)**	−0.006 (3.088)**
Y_{97}	0.00007 (0.029)	−0.0003 (−0.186)	–	−0.008 (−4.606)**
Y_{98}	0.0003 (0.128)	–	0.002 (0.517)	–
Adjusted R^2	0.0231	0.0456	0.0462	0.0772
N	2,353	1,452	544	226

Note: Period 1 – IPO before 1997 (from January 1992 to December 1996).
Period 2 – IPO in between January 1997 and August 1997.
Period 3 – IPO since March 1998 (from March 1998 to December 1998).
*Significant at 5% level.
**Significant at 1% level.

Table 7. Differences in Net Income, Current Accruals, and Non-Operating Income in the IPO Year and Surrounding Years (Scaled by Lagged Total Assets, in %).

IPO Year	Year Relative to IPO Year (0)				
	−2	−1	0	+1	+2
Panel A: Differences in net income					
Period 1					
Mean[a]	2.73**	4.10**	4.90**	1.33**	−0.47
Median[b]	1.07**	1.96**	3.16**	0.70**	0.05
N[c]	275	296	348	404	446
Period 2					
Mean[a]	3.13**	2.88**	4.32**	0.75	△
Median[b]	1.77**	1.65**	3.18**	0.41	
N[c]	129	129	139	149	

Table 7. (*Continued*)

IPO Year	Year Relative to IPO Year (0)				
	−2	−1	0	+1	+2
Period 3					
Mean[a]	4.02**	1.59*	2.04**	△	△
Median[b]	1.99**	0.78*	1.75**		
N[c]	67	72	73		
Panel B: Differences in current accruals					
Period 1					
Mean[a]	△	6.67	3.79	−7.35**	−2.07
Median[b]		1.05	4.79*	−5.56**	−2.65
N[c]		116	208	366	437
Period 2					
Mean[a]	△	1.38	15.86*	−9.95**	△
Median[b]		3.54	12.30**	−9.01**	
N[c]		113	125	147	
Period 3					
Mean[a]	△	−0.79	15.90**	△	△
Median[b]		1.46	11.32**		
N[c]		66	73		
Panel C: Differences in non-operating income					
Period 1					
Mean[a]	0.36**	0.98**	1.88**	1.10	0
Median[b]	0.08**	0.11*	1.16**	0.12*	−0.03
N[c]	200	235	334	403	446
Period 2					
Mean[a]	0.11	0.37*	1.39**	0.15	△
Median[b]	0.01	0.02	0.58**	−0.01	
N[c]	122	128	139	148	
Period 3					
Mean[a]	0.19	0.02	0.84**	△	△
Median[b]	0	0	0.41**		
N[c]	69	73	74		

Note: △: Sample size too small.

[a] A *t*-test is used to examine the statistical significance level of the mean.

[b] A non-parametric test (Wilcoxon signed-ranks) is used to examine the statistical significance level of the median.

[c] The number of observations varies from year to year according to data availability.

* Significant at the 5% level.

** Significant at the 1% level.

Table 8. Differences in Net Income, Current Accruals, and Non-Operating Income in the IPO Year and Surrounding Years for the Same Firms (Scaled by Lagged Total Assets, in %).

IPO Year		Year Relative to IPO Year (0)	
		0	+1
Panel A: Differences in net income			
Period 1	Mean[a]	4.88**	1.22**
	Median[b]	3.14**	0.64**
	$N = 343$		
Period 2	Mean[a]	4.32**	0.64
	Median[b]	3.18**	0.39
	$N = 139$		
Panel B: Differences in current accruals			
Period 1	Mean[a]	4.35	−5.44**
	Median[b]	4.94*	−5.36**
	$N = 203$		
Period 2	Mean[a]	15.56**	−10.16**
	Median[b]	12.18**	−9.11**
	$N = 124$		
Panel C: Differences in non-operating income			
Period 1	Mean[a]	1.89**	0.46**
	Median[b]	1.16**	0.05
	$N = 331$		
Period 2	Mean[a]	1.39**	0.12
	Median[b]	0.59**	−0.01
	$N = 138$		

[a] A *t*-test is used to examine the statistical significance level of the mean.
[b] A non-parametric test (Wilcoxon signed-ranks) is used to examine the statistical significance level of the median.
* Significant at the 5% level.
** Significant at the 1% level.

As firms' net income comprise two parts, namely cash flow and accruals, it may be interesting to investigate into the cash flow. However, since Chinese accounting standards only require the preparation of cash flow statements as of January 1998, this study cannot obtain the data of cash flow from operations. Owing to the scarcity of the data, I use all the available firm-years for preparation of Table 7. In order to have a better picture of the changes in IPO years and one year afterwards, I narrow down my sample to those firms that have these two

Table 9. Distribution of Prospectus Forecast Error.

	Period 1		Period 2		Period 3	
	Number	%	Number	%	Number	%
Overestimate < 10%	32	9.17	19	14.29	17	26.56
Overestimate 10–20%	25	7.16	11	8.27	6	9.38
Overestimate > 20%	110	31.52	37	27.82	21	32.81
Subtotal: Overestimate	167	47.85	67	50.38	44	68.75
Accurate	12	3.44	4	3.01	1	1.56
Underestimate < 10%	56	16.05	19	14.29	9	14.06
Underestimate 10–20%	44	12.61	16	12.03	5	7.81
Underestimate > 20%	70	20.06	27	20.30	5	7.81
Subtotal: Underestimate	170	48.71	62	46.62	19	29.69
Total	349	100.00	133	100.00	64	100.00

Period 1 – IPO before 1997(from January 1992 to December 1996).
Period 2 – IPO in between January 1997 and August 1997.
Period 3 – IPO since March 1998 (from March 1998 to December 1998).

years data available. Results are reported in Table 8. Basically, there is no great difference between Tables 7 and 8. In panel B and C of Table 8, the reversal of current accruals is significant while the increase in non-operating income is still significant for the Period 1. One explanation is that firms using forecasted EPS to set IPO price mostly use non-operating income rather than current accruals to manage earnings. In addition, their incentive to manage earnings is less prior to IPO as compared to the group of firms using past EPS to set IPO price.

Regarding the bias for the prospect forecast, a percentage comparison is summarized in Table 9. The number of optimistic bias is highest in the Period 3. The number of optimistic and pessimistic bias is more or less equal for the Period 2, when forecasted EPS is not used to set IPO prices. There is more pessimistic bias in the Period 1 than expected from our hypothesis that is consistent with the result from Xu (1997). He explained that the IPO firms tend to disclose a more conservative earnings forecast in the earlier years. When we focus on the biggest overestimation (>20%), we can find that the percentage of biggest underestimation (>20%) in the Periods 1 and 3 is larger than that in the Period 2, which is consistent with my prediction in Hypothesis 6 but the result is not significant. Facing the probable penalty from CSRC, the IPO firms still try hard to overestimate their PFE by more than 20% in Periods 1 and 3.

Table 10. Regression Results for Forecasted EPS and Prospectus Forecast Error for Whole Sample.

Model 3: $f\text{EPS}_i = \alpha + \beta_1 p\text{EPS}_i + \beta_2 \text{LogTA}_i + \beta_3 \text{IPOprice}_i + \beta_4 \text{Core\%}_i + \beta_5 \text{Horizon}_i + \beta_6 \text{Pdummy1}_i \times \text{IPOprice}_i + \beta_7 \text{Pdummy2}_i \times \text{IPOpric}_i + \beta_8 \text{Pdummy3}_i \times \text{IPOprice}_i + \Sigma\beta_t Y_{it} + \varepsilon_i$

Model 4: $\text{PFE}_i = \alpha + \beta_1 \text{LogTA}_i + \beta_2 \text{IPOprice}_i + \beta_3 \text{Core\%}_i + \beta_4 \text{Horizon}_i + \beta_5 \text{Pdummy1}_i \times \text{IPOprice}_i + \beta_6 \text{Pdummy2}_i \times \text{IPOprice}_i + \beta_7 \text{Pdummy3}_i \times \text{IPOprice}_i + \Sigma\beta_t Y_{it} + \varepsilon_i$

	Model 3: Forecasted EPS (*t*-Value)	Model 4: Prospectus Forecast Forecast Error (*t*-Value)
Intercept	−1.587 (−2.379)	−7.509 (−2.686)
pEPS	0.475 (3.205)***	–
LogTA	0.137 (2.939)***	0.533 (2.746)***
IPOprice	−0.011 (−0.313)	−0.214 (−1.468)
Core%	0.112 (0.890)	1.926 (3.662)***
Horizon	0.023 (1.775)*	0.155 (2.880)***
Pdummy1 × IPOprice	0.100 2.152**	0.313 (1.621)*
Pdummy2 × IPOprice	−0.008 (−0.262)	−0.070 (−0.547)
Pdummy3 × IPOprice	0.004 (0.086)	0.061 (0.296)
Y_{92}	−0.472 (−1.356)	−1.143 (−0.782)
Y_{93}	−0.422 (−1.439)	−1.544 (−1.250)
Y_{94}	−0.658 (−2.157)**	−2.223 (−1.731)**
Y_{95}	0.922 (2.580)***	3.509 (2.334)**
Y_{96}	0.080 (0.290)	0.902 (0.779)
Y_{97}	−0.127 (−0.487)	−0.384 (−0.349)
Adjusted R^2	0.0921	0.0888
N	593	593

*Significant at 10% level.
**Significant at 5% level.
***Significant at 1% level.

The regression results on forecasted EPS and prospectus forecast error are summarized in Table 10. In the first regression for forecasted EPS, my result is a bit different from Xu (1997). While the coefficients for the mean of past three years EPS and log total assets are positively significant as expected, the signs of IPO price and core operating profit% are negative and positive respectively. The coefficient of Period 1 dummy multiplied by IPO price is significant at 5% level and indicates that using forecasted earnings to set IPO price may induce overstatement of forecasted earnings. The coefficient of Period 3 is not significant. This may be resulted from the relatively small sample in this period. The result for prospectus forecast error is also consistent with our hypothesis although the coefficient is less significant.

CONCLUSIONS

This preliminary study examines whether Chinese firms manage earnings for IPO purpose and whether this behavior is related to the regulations of IPO price. This study is based on the transactions involving current accruals and non-operating incomes. The regulations on IPO prices changed from time to time. The requirement of using past three-year average EPS was actually effective from January 1997 to August 1997. Based on the available data of A-share Chinese firms listed from 1992 to 1998, I observe that the firms reported a significant higher amount of current accruals and non-operating incomes in the pre-IPO periods as compared to the post-IPO periods. The latter phenomenon is more distinct for firms listed in between January 1997 and August 1997 (Table 6). This result indicates that using past three-year average EPS to set the IPO price may be an additional incentive for earnings management. However, the current regulation reverting to use forecasted EPS still cannot mitigate the incentive for earnings management (Table 7).

With a view to raising the IPO price in order to get more financing, firms have strong incentive to manage earnings. Using neither forecasted earnings nor past earnings to set IPO price may significantly mitigate the earnings management phenomenon. This finding has important implications for the regulators in China in setting the IPO price. The major limitation of this paper is that the main data source is TEJ December 1999 version. That means most of the financial data for the year ended 1999 are not available and there is not much post-IPO data for the Period 3 (listed after March 1998) and even for the Period 2.

Only current accruals reverse but non-operating incomes do not change much in the post-IPO periods. It may also be a result of regulations in 1998 that allows companies to make enough allowance for accounts receivables, inventories and short-term and long-term investments. The patterns of the changes in different earnings measure for different periods are not distinctly different. It may due to the fact that although the management is freely to make the earnings forecast, the forecast is still more or less related to past years earnings.

NOTES

1. I used A-share data in this paper. However, the Chinese government has allowed local Chinese investors to buy B shares since February 2001. This move blurs the line between domestic and foreign types of equity and could pave the way for combining them in the future. The different features between A shares and B shares became insignificant now.

2. CSRC Notice, December 26, 1996 clearly stated that all new issues in 1996 should use the past three-year average EPS to determine the IPO price. Since this notice issued in December 26, most IPO firms in 1996 still use the old regulations.

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THE USEFULNESS OF GEOGRAPHIC SEGMENT DISCLOSURE FOR U.S.-BASED MNCs OPERATING IN EMERGING MARKETS

Anna D. Martin and Patricia M. Poli

ABSTRACT

The current accounting rules no longer require detailed disclosure of geographic segment information, in particular geographic segment earnings. This study uses a sample of U.S.-based multinational corporations operating in emerging markets and finds that geographic segment data are relevant for shareholders. We find these data help to characterize exchange rate exposure, explain residual stock returns, and discern differences in earnings quality.

INTRODUCTION

Finance theory argues that corporate decisions should be examined from the shareholders' point of view with value maximization as the goal of the firm. From the shareholders' point of view, exchange rate risk is relevant to the extent that it impacts the value of the firm. It is sometimes argued that exchange rate risk is firm specific and is thus irrelevant for well-diversified investors. However, Dumas and Solnik (1995), De Santis and Gérard (1998), and Doukas et al. (1999) find that the market considers exchange rate risk.

Advances in International Accounting
Advances in International Accounting, Volume 17, 199–225

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17010-4

A key concern for investors assessing the impact of exchange rate risk on the value of the firm is how exchange rate risk impacts cash flows and net income. Exposure to exchange rate risk impacts cash flows by changing the cost of foreign currency-denominated inputs as well as the sales volume and revenue generated at home and abroad. Froot et al. (1993) provide strong arguments that corporate hedging strategies should focus on protecting cash flows so that value-enhancing corporate investments can be made. Survey evidence by Bodnar et al. (1995) and Bodnar et al. (1996) report that the primary concern of more than 90% of corporate managers that hedge is managing cash flows or accounting earnings.

Investors need accounting information to be relevant in order to make well-informed decisions. The FASB has identified relevance, defined as the ability of information to help form predictions about events, as one characteristic that can be used to distinguish more useful from less useful information.[1] Prior research finds geographic segment reporting useful and relevant for investors, especially when the different areas in which a company does business have different risk profiles (Ahadiat, 1993; Boatsman et al., 1993). Balakrishnan et al. (1990) found that these data can enhance predictions of sales, while Ahadiat (1993) confirms this finding and further states that disaggregated information has greater predictive power than total earnings. However, many (e.g. Thomas, 2000) have criticized the low quality of the information contained in the geographic segment disclosures. In particular, the usefulness of the information is decreased because investors are unable to discern the origin of a firm's foreign earnings, the segments are not consistently reported (Thomas, 2000), or the disclosure is incomplete or missing (Boatsman et al., 1993).

The current standard dealing with disclosure of disaggregated accounting information is SFAS 131 (FASB, 1997). It superseded SFAS 14 (FASB, 1976) and modified the definition of segments to reflect how firms are organized and managed. Studies by Herrmann and Thomas (2000) and Street et al. (2000) show that more than 65% (less than 12%) of the sample companies define operating segments by line of business (geographic area). Additionally, SFAS 131 has reduced the detailed geographic disclosure which stands in sharp contrast to the International Accounting Standards Board's (IASB) revision of IAS 14 (IASB, 1997) in which the geographic information to be disclosed was increased. Herrmann and Thomas (2000) note that although SFAS 131 has resulted in an increase in the items reported for each operating section, the amount of information disclosed about geographic segments has decreased. Street et al. (2000) state that only 15% of their sample provided this information under FASB 131, while 84% of the same group of companies provided that information under FASB 14.

The approach taken in this study is to investigate whether geographic segment information helps to characterize exchange rate exposure, explain residual stock

returns, and discern differences in earnings quality.[2] Using a sample of U.S.-based multinational corporations (MNCs) involved in emerging markets, we find that exchange rate exposure is significantly influenced by the degree of emerging market involvement, and especially for firms with positive exchange rate exposure, the exposure is related to the degree of imbalance in emerging market revenue and costs, and degree of incremental earnings that result from translation (too long of a sentence). We also find that the degree of incremental earnings resulting from translation significantly influences residual stock returns. Finally, we show that emerging market earnings are value-relevant and that the quality of earnings can differ across geographic segments. Therefore, we conclude that geographic segment disclosure is useful for shareholders.

FOCUS ON EMERGING MARKETS

This study analyzes U.S.-based MNCs that have operations in emerging market areas. Firms that conduct business in emerging markets, and their current and future shareholders, should be particularly concerned about the impact of emerging market exchange rate risk on stock returns and earnings quality.

Stock returns may be highly sensitive to emerging market exchange rate risk because of the volatility of these currencies and limited ability to hedge this risk. The currencies of emerging market countries typically experience greater volatility (Bekaert & Harvey, 1995; Erb et al., 1996) than the currencies of developed market countries, thus emerging market currencies are riskier. Furthermore, the currency derivatives markets in emerging market countries are less developed and often non-existent. Table 1 describes the current stage of development of the forward exchange markets in many emerging markets. The statements in this table are gathered from the International Monetary Fund (IMF) Special Data Dissemination Standard (SDDS), which was established to guide countries in distributing economic and financial data to the public. Of the 47 countries that voluntarily subscribe to the SDDS, 26 are emerging market countries. As indicated in Table 1, only seven of the 26 (27%) emerging market subscribers currently have active and presumably accessible forward exchange markets. Since forward contracts are the predominant hedging instrument used by corporations (Bodnar et al., 1995), the inaccessibility of forward exchange markets for emerging market currencies makes it difficult and, in some cases, impossible for firms with emerging market operations to hedge this risk.[3]

The risk inherent in emerging market operations and the inability to effectively hedge this risk many affect the quality of earnings of MNCs operating in emerging market regions. In empirical tests, Easton and Zmijewski (1989) and Collins and

Table 1. Stage of Development of Forward Foreign Exchange Markets in Emerging Markets.[a]

Country	Stage of Development	Last Updated
Argentina	There is no forward exchange of significance	03-21-2000
Chile	Forward exchange market is not yet fully developed	03-28-2000
Colombia	Forward exchange market exists, most transactions are for 13–14 days[b]	11-22-1999
Croatia	Forward exchange market is not yet fully developed	04-29-1998
Czech Republic	Forward exchange market is not yet significant	07-07-2000
Ecuador	There is no forward exchange market	09-18-2000
El Salvador	There is no forward exchange market	07-13-2000
Estonia	There is no broad-based forward exchange market	03-21-2000
Hungary	There is an established forward exchange market, but it is insignificant	08-03-2000
Iceland	There is no established forward rate market	10-15-1999
India	1, 3, and 6-month forward rates are available[b]	08-10-2000
Indonesia	3 and 6-month forward rates are available[b]	03-08-2000
Israel	There is no forward exchange market	08-14-2000
Korea	Forward exchange market is not sufficiently developed	08-09-2000
Latvia	Forward market transactions are not significant	11-11-1999
Lithuania	Forward exchange market is not yet significant	10-02-1999
Malaysia	3 and 6-month forward rates are available[b]	04-05-2000
Mexico	Forward exchange market is very small with very variable terms	04-12-2000
Peru	There is no established forward exchange market	03-03-2000
Philippines	Forward exchange market is not yet developed	09-28-2000
Poland	There is no broad-based forward foreign exchange market	03-02-2000
Slovak Republic	3 and 6-month forward rates are available[b]	04-12-2000
Slovenia	Forward exchange market is not sufficiently developed	10-24-2000
South Africa	3 and 6-month forward rates are available[b]	10-20-2000
Thailand	3 and 6-month forward rates are available[b]	08-15-2000
Turkey	Forward exchange market is not yet fully developed	06-22-2000

[a] These statements are from the International Monetary Fund's (IMF) Special Data Dissemination Standard (SDDS). There are a total of 47 countries that voluntarily subscribe to the SDDS, which is intended to guide countries in providing economic and financial data to the public. Of these 47 countries, the 26 emerging market countries that subscribe to the SDDS are listed here.

[b] Emerging market subscribers considered to have active forward exchange markets as of the date the IMF record was last updated.

Kothari (1989) document an inverse relationship between earnings quality and risk. Of particular concern for investors is the differential accounting treatment for companies operating in inflationary markets, as is the case in many emerging markets. Per Financial Accounting Standards Board (FASB) Statement No. 52 (FASB, 1980a, b), companies operating in countries experiencing high inflation are required to report translation adjustments on the income statement. Research

by Bartov (1997) and Collins and Salatka (1993) finds that companies reporting the translation adjustments on the income statement have less value-relevant and therefore lower quality earnings streams. Soo and Soo (1994) however find no significant difference in earnings quality between companies reporting the translation adjustment on the income statement when compared to companies reporting the adjustment as a component of stockholders' equity on the balance sheet. Bartov (1997) explains that the Soo and Soo results could be due to the use of aggregate earnings rather than separating the translation adjustment from earnings. Indeed, Lipe (1986) and Ohlson and Penman (1992) show the returns-earnings regression is improved when earnings components rather than aggregate earnings are used.

HYPOTHESES

Assessing Exposure to Emerging Market Exchange Rate Risk

Given the limited and/or non-existent derivatives markets for many emerging market currencies (see Table 1), MNCs involved in emerging markets must rely upon more complicated and arguably less effective means to hedge. For example, operational hedging as an alternative involves geographically positioning operations so that the impact of exchange rate changes on cash inflows and cash outflows are naturally offset. Kogut and Kulatilaka (1994) and Mello et al. (1995) model the flexibility in shifting production across geographically dispersed locations and find value in the option to shift production under conditions of exchange rate movements. However, operational hedging in this way is unlikely to be undertaken as Hodder (1982) and Pringle and Connolly (1993) recognize that relocating operations is an expensive way to hedge. We believe that MNCs operating in emerging markets remain unhedged due to the limited derivative markets for emerging market currencies and the difficulty in implementing operational hedges and are therefore are significantly exposed to emerging market currency risk. Our first hypothesis, stated in the alternative is:

H1a. U.S.-based MNCs operating in emerging markets are significantly exposed to emerging market currency risk.

Capital market measures of exchange rate exposure assess the impact of exchange rate risk on the values of firms. Economic and accounting exposure factors are examined for their ability to explain the cross-sectional variation in capital market measures of exchange rate exposure. Economic exposure alters the competitive position of a firm and its competitors by influencing relative costs, prices, and sales volume as exchange rates fluctuate. Transaction exposure is often viewed as a subset of economic exposure since real cash flows are affected. Specific

contractual obligations create transaction exposure when the exchange rate level cannot be projected with certainty at the time the obligatory cash flows occur. Accounting (translation) exposure results from following accounting procedures that attempt to capture the economic effects of exchange rate changes in consolidated financial statements. These exposures are represented by the following factors that are derived from financial statements:

(1) Emerging market involvement – Past studies find that greater foreign involvement induces greater exchange rate exposure (e.g. Jorion, 1990). Thus, greater emerging market involvement is hypothesized to be associated with greater emerging market exchange rate exposure.
(2) Operational hedge – Input costs incurred by foreign subsidiaries generate foreign currency cash outflows while revenue received by foreign subsidiaries generate foreign currency cash inflows. A greater degree of balance in the proportion of foreign currency denominated revenues and costs produces a natural or operational hedge. Heckerman (1972) recognizes that geographically balancing operations can reduce exposure. Martin et al. (1999) empirically show capital market exposure estimates are higher for firms with greater geographic imbalance. Thus, we hypothesize that MNCs operating with greater imbalance in emerging market revenues and costs are more exposed to emerging market exchange rate risk.
(3) Cash flow – The exposure captured by the statement of cash flows may indicate the degree of net transaction exposure incurred over the reporting period. Transaction exposure considers the net impact of foreign currency-denominated payables and receivables. We hypothesize that greater net emerging market transaction exposure is associated with greater emerging market exchange rate exposure.
(4) Income statement – The income statement effect considered in this paper reflects the incremental or decremental emerging market earnings that result due to translating these earnings over periods when the dollar weakens or strengthens.[4] MNCs with larger proportions of earnings generated from this type of net translation exposure should be considered riskier. To the extent that this type of accounting exposure inferred from the reported emerging market segment data is considered relevant by the financial market, we expect that MNCs with greater net translation exposure are more exposed to emerging market exchange rate risk.
(5) Balance sheet – This balance sheet effect is the traditional measure of accounting exposure that captures translation gains and losses charged to shareholders' equity. Since this measure has no cash flow consequences, we expect that it does not significantly influence the capital market measure of

exposure.[5] This item is included for completeness in representing accounting exposure from the perspective of all three key financial statements. Nonetheless, if this information is useful for the financial market to assess exchange rate exposure, we believe that MNCs with greater translation effects have greater exchange rate exposure.

Significant relationships between these variables and a capital market measure of exchange rate exposure would support the relevance of geographic segment data.

To summarize and formally state our hypothesis, in the alternative, is:

H2a. For U.S.-based MNCs operating in emerging markets, greater exposure to emerging market currency risk is associated with greater economic exposure (measured by the degree of emerging market involvement, imbalance in emerging market revenues and costs, and net emerging market transaction exposure) and greater accounting exposure (measured by incremental earnings resulting from translation and changes in shareholders' equity due to translation gains/losses).

Assessing Effects of Emerging Market Exchange Rate Exposure on Residual Returns

We also examine the relevance of geographic segment information by investigating the cross-sectional relationship between residual stock returns and the same economic and accounting exposure factors used to assess the exposure to exchange rate risk. The expected direction of influence mirrors that of the previous section on exposure to exchange rate risk, since higher levels of risk are associated with higher returns. More formally, the hypothesis, stated in the alternative, is:

H3a. For U.S.-based MNCs operating in emerging markets, higher unexpected returns are generated with greater economic exposure (measured by the degree of emerging market involvement, imbalance in emerging market revenues and costs, and net emerging market transaction exposure) and greater accounting exposure (measured by incremental earnings resulting from translation and changes in shareholders' equity due to translation gains/losses).

Assessing the Effect of Operating in Emerging Markets on Earnings Quality

Earnings quality is concerned with the information content of reported earnings and whether that information reflects the performance of a firm. In other words, it

examines the contribution of earnings to the prediction of investors' returns. The earnings response coefficient (ERC) is typically used as a proxy for the quality of earnings since it reflects the stock price response to earnings surprises. Easton and Harris (1991), Easton et al. (1992), Kothari and Zimmerman (1995), and others find that earnings are value-relevant and that the more sensitive unexpected returns are to these unexpected earnings, the higher the earnings quality.[6]

In this study, we examine whether the emerging market operations of U.S.-based MNCs affect the quality of earnings. Accordingly, earnings are decomposed into emerging market earnings and non-emerging market earnings to determine whether there is any difference in the quality of these two components. Therefore, we estimate and compare ERCs for both components. Since emerging market currencies are highly volatile (Bekaert & Harvey, 1995; Erb et al., 1996) and economic and political conditions are generally unstable, earnings generated from emerging markets are riskier. Considering that Collins and Kothari (1989) and Easton and Zmijewski (1989) detect an inverse relation between ERCs and risk, we hypothesize that emerging market earnings will have lower ERCs (i.e. lower quality) than non-emerging market earnings. Our hypothesis, stated in the alternative is:

H4a. For U.S.-based MNCs operating in emerging markets, the unexpected earnings from the emerging market segments have lower ERCs than the non-emerging market segments.

SAMPLE

U.S.-based MNCs with involvement in emerging markets during the period 1992–1998 are identified using geographic segment data collected from Compustat. The resulting 593 companies are required to meet two additional criteria. First, at least four consecutive years of consistently reported data must be available. Since many of the tests examine specific emerging markets, the emerging market geographic areas must be consistently reported and no other geographic area may be combined with the emerging market geographic areas. Second, at least 60 monthly consecutive stock returns, obtained from the CRSP database, must be available.

Ultimately, there are 89 companies that meet the criteria. Twenty of these 89 companies report geographic segment data for two emerging market regions and one company reports geographic data for three emerging market regions. In total, 111 geographic segments are examined in this study. There are three distinct emerging market regions represented in the 111 geographic segments: 72 segments in Latin America consisting of Mexico and South America, 24 segments in Africa, and

Table 2. Industry Distribution of Sample Segments by Emerging Market Area.

Group	SIC Code[a]	All Segments		Latin America		Africa		Middle East	
		No. of Companies	%	No. of Companies	%	No. of Companies	%	No. of Companies	%
Agriculture	100–999	1	0.9	1	1.4	0	0.0	0	0.0
Mining	1000–1499	18	16.2	10	13.9	4	16.7	4	26.7
Construction	1500–1999	2	1.8	1	1.4	0	0.0	1	6.7
Food	2000–2199	2	1.8	2	2.8	0	0.0	0	0.0
Paper and printing	2600–2799	2	1.8	2	2.8	0	0.0	0	0.0
Chemicals	2800–2999	31	27.9	22	30.6	8	33.3	1	6.7
Plastic, glass, cement	3000–3299	5	4.5	4	5.6	1	4.2	0	0.0
Steel and machinery	3300–3999	27	24.3	16	22.2	6	25.0	5	33.3
Transportation and utilities	4000–4999	3	2.7	2	2.8	1	4.2	0	0.0
Wholesale	5000–5199	5	4.5	3	4.2	2	8.3	0	0.0
Retail	5200–5999	2	1.8	1	1.4	0	0.0	1	6.7
Financial services	6000–6999	3	2.7	2	2.8	1	4.2	0	0.0
Other services	7000–8999	10	9.0	6	8.3	1	4.2	3	20.0
Totals		111	100.0	72	100.0	24	100.0	15	100.0

[a] The MNCs are categorized by Compustat based on the U.S. Commerce Department SIC classifications.

15 segments in the Middle East.[7] Table 2 shows the industry distribution and emerging market area distribution of the MNCs in the sample. This table reveals that the majority of the companies are in either the chemicals or steel and machinery industries. This holds true for the Latin America, Africa, and Middle East sub-samples.

METHODOLOGY AND DATA

The methodology in this study focuses on capital market approaches to help substantiate the relevance of geographic segment data. The ultimate test of the relevance of these data is whether they influence capital market measures of risk and return.

Estimating and Assessing Exchange Rate Exposure

In this study, the capital market measure of exchange rate exposure is estimated as the sensitivity of stock returns to exchange rate changes following Adler and Dumas (1984), Jorion (1990), Choi and Prasad (1995), He and Ng (1998), Martin et al. (1999), Allayannis and Ofek (2001), and others. First, exchange rate exposures are estimated for each company in the sample over the 1992–1998 time period. As stated in hypothesis H1, statistically significant emerging market exchange rate exposure should be prevalent for our sample of MNCs with operations in emerging markets, given the limited availability of currency derivatives for emerging market currencies (see Table 1) and the inherent riskiness of emerging markets. Then, the relationship between these exchange rate exposure estimates and measures of economic and accounting exposures are assessed as detailed in hypothesis H2. Detecting significant relationships would lend support to the relevance of geographic segment information.

Exchange rate exposures are estimated with respect to emerging market bilateral exchange rates and to emerging market currency indexes. We expect that detecting significant exposure should be easier using bilateral exchange rates than using exchange rate indexes. An index, by definition, is broader which makes the detection of exposure less likely unless the firms are exposed to the specific group of currencies included in the index and with the same relative importance. Nonetheless, estimating exposure to regional exchange rate indexes is more consistent with the way the geographic segment data are reported. Thus, exposure estimates are also generated using emerging market currency indexes.

Exposures are first estimated using the bilateral exchange rates that correspond to the emerging market region(s) in which the MNC conducts business. The

bilateral exchange rate data are obtained from the International Monetary Fund's International Financial Statistics (IFS). All exchange rates are expressed as foreign currency units per U.S. dollar. The set of bilateral exchange rates chosen for each region is based on the largest trading partners of the U.S., according to the Foreign Trade Division of the U.S. Census Bureau.

Two control variables are included in these models. First, the U.S. market portfolio is included to control for market-wide factors (Allayannis & Ofek, 2001; Choi & Prasad, 1995; He & Ng, 1998; Jorion, 1990; Martin et al., 1999). The CRSP equally-weighted market index is used to represent the U.S. market portfolio. Second, the developed country exchange rate index is included to control for exposure to developed country currencies. The developed country exchange rate index is generated by applying equal weights to the percent changes in the ECU, yen, and the Canadian dollar relative to the U.S. dollar.

The beta coefficients quantify the sensitivity of stock returns to movements in the market, the developed country exchange rate index, and the bilateral exchange rates.[8] Specifically, the β_3 through β_7 coefficients in Eqs (1), (2) and (3) measure exposure to the associated emerging market currency. A positive coefficient indicates that the MNC reaps net benefits from a strong U.S. dollar (weak emerging market currency). A negative coefficient reveals the MNC receives net benefits from a weak U.S. dollar (strong emerging market currency). An intercept shift, β_0, that accounts for a structural change due to the Asian currency crisis is also included in these models. We account for this crisis because it is believed to be the first global financial crisis affecting most emerging market regions of the world (Kamin, 1999).

(a) Model 1: Bilateral – Latin America

$$R_{it} = \beta_{0i} + \beta_{0'i}\text{ACRISIS}_t + \beta_{1i}R_{\text{mt}}^{\text{US}} + \beta_{2i}R_{\text{xt}}^{\text{DEV}} + \beta_{3i}R_{\text{xt}}^{\text{ARS}} + \beta_{4i}R_{\text{xt}}^{\text{BRL}} + \beta_{5i}R_{\text{xt}}^{\text{COP}} + \beta_{6i}R_{\text{xt}}^{\text{MXP}} + \beta_{7i}R_{\text{xt}}^{\text{VEB}} + \varepsilon_{it} \quad (1)$$

where:

R_{it} = return for MNC i in month t

ACRISIS_t = indicator variable equal to 1 from July 1997 through December 1998, and 0 otherwise

$R_{\text{mt}}^{\text{US}}$ = return for the U.S. market portfolio in month t

$R_{\text{xt}}^{\text{DEV}}$ = percent change in the developed market currency index relative to the U.S. dollar in month t

$R_{\text{xt}}^{\text{ARS}}$ = percent change in the Argentine peso exchange rate per U.S. dollar in month t

R_{xt}^{BRL} = percent change in the Brazilian real exchange rate per U.S. dollar in month t

R_{xt}^{COP} = percent change in the Colombian peso exchange rate per U.S. dollar in month t

R_{xt}^{MXP} = percent change in the Mexican peso exchange rate per U.S. dollar in month t

R_{xt}^{VEB} = percent change in the Venezuelan Bolivar exchange rate per U.S. dollar in month t

ε_{it} = error term for MNC i in month t

(b) Model 2: Bilateral – Africa

$$R_{it} = \beta_{0i} + \beta_{0'i}\text{ACRISIS}_t + \beta_{1i}R_{mt}^{US} + \beta_{2i}R_{xt}^{DEV} + \beta_{3i}R_{xt}^{DZD} + \beta_{4i}R_{xt}^{NGN} + \beta_{5i}R_{xt}^{ZAF} + \varepsilon_{it} \quad (2)$$

where:

R_{xt}^{DZD}= percent change in the Algerian Dinar exchange rate per U.S. dollar in month t

R_{xt}^{NGN}= percent change in the Nigerian Naira exchange rate per U.S. dollar in month t

R_{xt}^{ZAF}= percent change in the South African Rand exchange rate per U.S. dollar in month t

R_{it}, R_{mt}^{US}, R_{xt}^{DEV}, and ε_{it} were previously defined.

(c) Model 3: bilateral – Middle East

$$R_{it} = \beta_{0i} + \beta_{0'i}\text{ACRISIS}_t + \beta_{1i}R_{mt}^{US} + \beta_{2i}R_{xt}^{DEV} + \beta_{3i}R_{xt}^{EGP} + \beta_{4i}R_{xt}^{ILS} + \beta_{5i}R_{xt}^{SAR} + \varepsilon_{it} \quad (3)$$

where:

R_{xt}^{EGP}= percent change in the Egyptian Pound exchange rate per U.S. dollar in month t

R_{xt}^{ILS} = percent change in the Israeli New Shekel exchange rate per U.S. dollar in month t

R_{xt}^{SAR}= percent change in the Saudi Riyal exchange rate per U.S. dollar in month t

R_{it}, R_{mt}^{US}, R_{xt}^{DEV}, and ε_{it} were previously defined.

Exposures are then estimated for each MNC in the sample using regional emerging market currency indexes. The indexes are constructed by applying equal weights

to the movements in the bilateral exchange rates specified in the above three regional models. The β_3 through β_5 coefficients of Eq. (4) described below quantify the sensitivity of stock returns to the emerging market currency indexes. As previously described, the market portfolio and developed country currency indexes are included for control purposes. Also, as previously discussed, an intercept shift, $\beta_{0'}$, is included to account for a structural change due to the Asian currency crisis since it is believed to be the first global financial crisis.

(d) Model 4: multilateral – all regions

$$R_{it} = \beta_{0i} + \beta_{0'i}\text{ACRISIS}_t + \beta_{1i}R_{\text{mt}}^{\text{US}} + \beta_{2i}R_{\text{xt}}^{\text{DEV}} + \beta_{3i}R_{\text{xt}}^{\text{LA}} + \beta_{4i}R_{\text{xt}}^{\text{ME}} + \beta_{5i}R_{\text{xt}}^{\text{AF}} + \varepsilon_{it} \tag{4}$$

where:

$R_{\text{xt}}^{\text{LA}}$ = percent change in the Latin America currency index in month t
$R_{\text{xt}}^{\text{ME}}$ = percent change in the Middle East currency index in month t
$R_{\text{xt}}^{\text{AF}}$ = percent change in the Africa currency index in month t
R_{it}, $R_{\text{mt}}^{\text{US}}$, $R_{\text{xt}}^{\text{DEV}}$, and ϵ_{it} were previously defined.

In order to evaluate whether variables that represent economic and accounting exposure help explain the variation in exposure, a cross-sectional analysis is constructed. The dependent variable used in the cross-sectional analysis is the regional exposure(s) estimated from Eq. (4) that correspond to the region(s) in which the MNC reports that it conducts business. We use regional exposure measures because they are more consistent with the segment data available for constructing the independent variables in this cross-sectional analysis. The independent variables are calculated as the average over the seven-year period of study for each of the 111 geographic segments. The data used to construct the independent variables are obtained from the Compustat database. The alpha coefficients measure the sensitivity of the capital market measure of exchange rate exposure to the various economic and accounting exposure factors.

This and all subsequent cross-sectional analyses are conducted using rank regression. Rank regression is useful when a monotonic relation is expected between variables, yet the results are robust to outliers, non-normal distributions, and it does not require that the exact relation be specified. Bartov (1997) discusses these and other advantages of rank regression in the context of studying exchange rate exposure. The following cross-sectional model is investigated:

$$\beta_{\text{xi}} = \alpha_0 + \alpha_1\text{EMINV}_i + \alpha_2\text{EMOPH}_i + \alpha_3\text{CFLOW}_i + \alpha_4\text{INCST}_i + \alpha_5\text{BSHEET}_i + \mu_i \tag{5}$$

where: EMINV_i = ratio of emerging market sales to total sales for MNC segment i, EMOPH_i = (ratio of emerging market sales to total sales) minus (ratio of emerging market operating expenses to total operating expenses) for MNC segment i, CFLOW_i = change in appropriate average exchange rate for MNC segment $i \times$ {[(total accounts receivable × ratio of emerging market sales to total sales) minus (total accounts payable × ratio of emerging market operating expenses to total operating expenses)] scaled by total operating cash flow}, INCST_i = change in appropriate average exchange rate for MNC segment $i \times$ (ratio of emerging market operating income to total income), BSHEET_i = ratio of change in cumulative translation adjustment to total assets for MNC segment i, μ_i = error term for MNC segment i.

Summary statistics for the independent variables used in this model are presented in Panel A of Table 3. The mean ratio of emerging market sales to total sales (EMINV) is 15.8%, while the minimum ratio is 0.1% and maximum ratio is 80.7%. The mean degree of imbalance in the proportion of emerging market denominated cash inflows and cash outflows (EMOPH) is −0.2%, with the greatest imbalance being −0.5%. A negative degree of imbalance indicates that more cash outflows (in foreign currency) than cash inflows are generated. Interestingly, the median value for the MNCs in the sample indicates that emerging market currency outflows proportionately offset emerging market currency inflows. The mean impact of exposure on the statement of cash flows (CFLOW) has been inferred

Table 3. Descriptive Statistics for Independent Variables Used in Cross-Sectional Analyses.

Variable	Mean	Median	Minimum	Maximum
Panel A: Assessment of emerging market exchange rate exposure ($n = 111$)				
EMINV	0.158	0.118	0.001	0.807
EMOPH	−0.002	0.000	−0.477	0.074
CFLOW	−0.022	−0.008	−0.863	0.537
INCST	−0.029	−0.014	−0.384	0.046
BSHEET	−0.003	−0.001	−0.022	0.005
Panel B: Assessment of residual returns ($n = 535$)				
EMINV	0.161	0.114	−0.001	0.901
EMOPH	0.003	0.001	−0.458	0.321
CFLOW	−0.019	−0.008	−1.647	3.507
INCST	−0.031	−0.011	−1.643	0.285
BSHEET	−0.003	0.000	−0.066	0.061
Panel C: Assessment of emerging market exchange earnings quality ($n = 509$)				
UEEM	−0.005	0.001	−0.429	0.994
UENON	0.014	0.008	−1.241	0.671

as the net effect of emerging market exchange rate movements on accounts receivable and accounts payable as −2.2%, while the minimum impact is −86.3% and maximum impact is 53.7%. A negative (positive) impact indicates a greater effect on payables (receivables) than receivables (payables). The mean income statement effect (INCST) reflects a −2.9% impact on earnings due to translating emerging market earnings, with the largest decremental impact on earnings being −38.4% and largest incremental impact being 4.6%. The mean balance sheet effect (BSHEET) is −0.3%, where the largest negative effect is −2.2% and largest positive effect is 0.5%.

Calculating and Assessing Residual Stock Returns

A model where residual stock returns are a function of the same proxies for economic and accounting exposures is also used to ascertain whether geographic segment data are useful. This approach to determining whether accounting-based variables impact the value of the firm is similar to models summarized by Lev (1989). Residual stock returns are calculated as the difference between actual returns and estimated expected returns. Since the expected returns consider the exposure of the MNC to market risk, the residual returns are essentially market risk-adjusted abnormal returns. The estimated market model parameters of this model include an intercept shift to account for a potential structural shift due to the Asian currency crisis. Thus, monthly residual returns are calculated as:

$$\mathrm{MAR}_{it} = R_{it} - (\hat{\varphi}_{0i} + \hat{\varphi}_{0'i}\mathrm{ACRISIS}_t + \hat{\varphi}_{1i}R_{\mathrm{mt}}^{\mathrm{US}}) \tag{6}$$

where:

MAR_{it} = residual return for MNC i in month t
$\hat{\varphi}_{0i}$, $\hat{\varphi}_{0'i}$, $\hat{\varphi}_{1i}$ = market model parameters
R_{it}, $\mathrm{ACRISIS}_t$, and $R_{\mathrm{mt}}^{\mathrm{US}}$ were previously defined.

To test for value-relevance of geographic segment disclosures, we examine the relationship between the residual returns and the exchange rate exposure variables previously defined in Eq. (5) and stated in hypothesis H3. The dependent variable used in this analysis is the cumulative abnormal return, CAR, that is accumulated for 12 months ending with the fiscal year-end that is specified in the Compustat database.[9] The independent variables are calculated for each of the 111 MNC segments for each year over the period of study. The gamma coefficients below represent economic and accounting exposure effects of operating in emerging markets on residual returns. The value relevance of accounting disclosures is assessed

by testing for significant relationships in the following cross-sectional time series model:

$$\mathrm{CAR}_{it} = \lambda_0 + \lambda_1 \mathrm{EMINV}_{it} + \lambda_2 \mathrm{EMOPH}_{it} + \lambda_3 \mathrm{CFLOW}_{it} + \lambda_4 \mathrm{INCST}_{it} + \lambda_5 \mathrm{BSHEET}_{it} + \omega_{it} \quad (7)$$

where: CAR_{it} = monthly residual return accumulated over the 12-month period aligned by fiscal year-end t for MNC i. ω_{it} = error term for MNC i.

EMINV_{it}, EMOPH_{it}, CFLOW_{it}, INCST_{it}, and BSHEET_{it} were previously defined, although in this analysis the annual values are used rather than the previously described averages. The descriptive statistics for the independent variables used in the analyses are presented in Panel B of Table 3. The mean values are similar to as those in Panel A, since these variables are constructed in the same manner, with the exception that annual figures instead of seven-year averages are used. As expected, the minimum values are smaller and the maximum values are larger.

Defining and Assessing Earnings Quality

The quality of earnings is acknowledged to be high when reported earnings reflect firm performance. The sensitivity of stock returns to earnings, referred to as the earnings response coefficient, ERC, is used as the proxy for earnings quality. The more sensitive unexpected returns are to unexpected earnings, the higher the earnings quality. In assessing earnings quality, the unexpected returns are the CARs previously specified in Eq. (7).

Unexpected earnings are measured as the difference between the actual earnings and expected earnings deflated by price at the beginning of the period.[10] The data to calculate unexpected earnings are obtained from the Compustat database. Expected earnings are estimated using the random walk time series model. This approach is consistent with Kormendi and Lipe (1987), Collins and Kothari (1989), Biddle and Seow (1991), and others. The unexpected earnings per share stream is disaggregated into emerging market and non-emerging market components. Of particular interest is the earnings quality of emerging market segment earnings. Decomposing earnings into components should provide additional information (e.g. Lipe, 1986; Ohlson & Penman, 1992). Furthermore, O'Glove (1987) believes that an examination of the components of earnings is necessary to assess the quality of earnings. More specifically, Balakrishnan et al. (1990), Ahadiat (1993), and Boatsman et al. (1993) provide evidence that geographic components of earnings provide useful information for shareholders.

The coefficients, β_1 and β_2, in the cross-sectional time series model below measure the sensitivity of unexpected returns to unexpected earnings:

$$CAR_{it} = \nu_0 + \nu_1 UEEM_{it} + \nu_2 UENON_{it} + \delta_{it} \quad (8)$$

where: $UEEM_{it}$ = actual emerging market earnings minus expected emerging market earnings per share for MNC segment i in year t deflated by market price at the beginning of year t, $UENON_{it}$ = actual non-emerging market earnings minus expected non-emerging market earnings per share for MNC segment i in year t deflated by market price at the beginning of year t, δ_{it} = error term for MNC segment i in year t. CAR_{it} was previously defined.

As stated in hypothesis H4, we expect β_1 to be significantly lower than β_2.

The descriptive statistics for the independent variables used in the earnings quality model are presented in Panel C of Table 3. The average unexpected emerging market earnings per share (UEEM) is −0.005, with minimum and maximum unexpected earnings per share of −0.429 and 0.994. The mean unexpected non-emerging market earnings per share (UENON) is 0.014, with minimum and maximum unexpected earnings per share of −1.241 and 0.671. The mean and median values of UEEM are all smaller than UENON.

RESULTS

Estimating and Assessing Exchange Rate Exposure

The frequency of significant coefficient estimates is detailed in Panel A of Table 4 when the bilateral models are used and in Panel B of Table 4 when the exchange rate index model is used.[11] The number of MNCs (percentage in parentheses) with significant emerging market exchange rate exposure, U.S. market exposure, and developed market exchange rate exposure is provided. Panel A reports that 40 of 72 (56%) of the U.S.-based MNCs with operations in Latin America are significantly exposed to at least one of the Latin American currencies. Only 4 of 24 (17%) of the MNCs with African operations exhibit significant exposure to at least one of the African currencies and 2 of 15 (13%) of the MNCs with operations in the Middle East are significantly exposed to at least one of the Middle Eastern currencies.[12] Overall, 43 out of 89 (48%) of the MNCs have significant exposure to at least one of the emerging market currencies where they disclose emerging market business activity. The widespread emerging market exchange rate exposures detected in this sample are consistent with hypothesis H1 that the limited availability of currency derivatives prevents many MNCs from hedging their emerging market exchange rate risk.

Table 4. Frequency of Significant Coefficient Estimates.

	Number of U.S.-Based MNCs (%)		
	Emerging Market Exchange Rate Exposure	U.S. Market Exposure	Developed Market Exchange Rate Exposure
Panel A: Emerging market exchange rate exposures[a] estimated using bilateral rates			
Latin America ($n = 72$)	40 (56%)	63 (88%)	18 (25%)
Africa ($n = 24$)	4 (17%)	21 (88%)	9 (38%)
Middle East ($n = 15$)	2 (13%)	15 (100%)	6 (40%)
All emerging market ($n = 89$)	43 (83%)	81 (91%)	26 (29%)
Panel B: Emerging market exchange rate exposures[b] estimated using currency indexes			
Latin America ($n = 72$)	14 (19%)	63 (88%)	15 (21%)
Africa (n =24)	1 (4%)	19 (79%)	9 (38%)
Middle East ($n = 15$)	2 (13%)	15 (100%)	6 (33%)
All emerging market ($n = 89$)	16 (18%)	80 (90%)	20 (22%)

[a] The following equations estimate exchange rate exposures using bilateral rates that correspond to the countries of the emerging market region(s) in which the MNC conducts business:

$$\text{Latin America: } R_{it} = \beta_{0i} + \beta_{0'i}\text{ACRISIS}_t + \beta_{1i}R_{\text{mt}}^{\text{US}} + \beta_{2i}R_{\text{xt}}^{\text{DEV}} + \beta_{3i}R_{\text{xt}}^{\text{ARS}} + \beta_{4i}R_{\text{xt}}^{\text{BRL}} + \beta_{5i}R_{\text{xt}}^{\text{COP}} + \beta_{6i}R_{\text{xt}}^{\text{MXP}} + \beta_{7i}R_{\text{xt}}^{\text{VEB}} + \varepsilon_{it}$$

$$\text{Africa: } R_{it} = \beta_{0i} + \beta_{0'i}\text{ACRISIS}_t + \beta_{1i}R_{\text{mt}}^{\text{US}} + \beta_{2i}R_{\text{xt}}^{\text{DEV}} + \beta_{3i}R_{\text{xt}}^{\text{DZD}} + \beta_{4i}R_{\text{xt}}^{\text{NGN}} + \beta_{5i}R_{\text{xt}}^{\text{ZAR}} + \varepsilon_{it}$$

$$\text{Middle East: } R_{it} = \beta_{0i} + \beta_{0'i}\text{ACRISIS}_t + \beta_{1i}R_{\text{mt}}^{\text{US}} + \beta_{2i}R_{\text{xt}}^{\text{DEV}} + \beta_{3i}R_{\text{xt}}^{\text{EGP}} + \beta_{4i}R_{\text{xt}}^{\text{ILS}} + \beta_{5i}R_{\text{xt}}^{\text{SAR}} + \varepsilon_{it}$$

[b] The following equation estimates exchange rate exposures using exchange rate indexes:

$$R_{it} = \beta_{0i} + \beta_{0'i}\text{ACRISIS} + \beta_{1i}R_{\text{mt}}^{\text{US}} + \beta_{2i}R_{\text{xt}}^{\text{DEV}} + \beta_{3i}R_{\text{xt}}^{\text{LA}} + \beta_{4i}R_{\text{xt}}^{\text{ME}} + \beta_{5i}R_{\text{xt}}^{\text{AF}} + \varepsilon_{it}$$

In Panel B of Table 4, as expected, the frequency of significant emerging market exchange rate exposure is much lower. Only 14 of 72 (19%) of the MNCs with operations in Latin America, 1 of 15 (4%) with operations in Africa, 2 of 15 (13%) with operations in the Middle East, and 16 of 89 (18%) overall are significantly exposed to the associated emerging market currency index. It is plausible that using indexes to estimate exchange rate exposure impedes the detection of statistically significant exposure unless the firms are exposed to the specific group of currencies represented by the index with the same relative importance.

The frequency of significant exposure to U.S. market risk and developed market exchange rate risk is also reported in Table 4. Overall, 81 of the 89 (91%)

MNCs in our sample have significant U.S. market exposure. Furthermore, 26 out of 89 (29%) of these MNCs have significant developed market exchange rate exposure.

Table 5 details the results of the analyses that assess the importance of the accounting and economic exposure factors, derived using geographic segment data, in explaining the cross-sectional variation in emerging market exchange rate exposure. Recall these exposure estimates are generated from the currency index model of Eq. (4) because this approach is more consistent with the segment data used to create the independent variables.

Table 5. Assessing Emerging Market Exchange Rate Exposure.

Panel A: Full Sample and Subsets

Variable	Full Sample	Positive β_x	Negative β_x
Intercept	-0.8590 $(-3.40)^{***}$	-1.0596 $(-2.19)^{**}$	-0.1165 (-0.81)
EMINV	0.0010 (0.47)	0.0064 $(1.79)^{*}$	-0.0025 $(-2.32)^{**}$
EMOPH	0.0079 $(4.08)^{***}$	0.0077 $(2.40)^{**}$	0.0015 (1.42)
CFLOW	0.0006 (0.34)	0.0039 (1.15)	0.0000 (0.03)
INCST	0.0065 $(2.90)^{**}$	0.0108 $(3.01)^{***}$	-0.0014 (-1.15)
BSHEET	-0.0002 (-0.09)	-0.0007 (-0.21)	-0.0009 (-0.97)
N	111	41	70
F	4.22^{***}	3.04^{**}	2.15^{*}
Adjusted R^2	0.1276	0.2033	0.0768

Panel B: Regional Subsets

Variable	Full Sample	South America	Africa	Middle East
Intercept	-0.8340 $(-3.27)^{***}$	-0.5726 $(-2.94)^{***}$	0.0478 (0.18)	-1.1957 (-0.38)
EMINV	0.0009 (0.42)	0.0019 (1.16)	-0.0018 (-0.90)	-0.0099 (-0.89)
EMOPH	0.0079 $(4.18)^{***}$	0.0042 $(2.80)^{***}$	0.0013 (0.75)	0.0207 $(1.92)^{*}$
INCST	0.0066 $(3.05)^{*}$	0.0026 (1.48)	-0.0007 (-0.30)	0.0152 (0.58)
N	111	72	24	15
F	7.11^{***}	3.01^{**}	0.60	1.99
Adjusted R^2	0.1429	0.0781	-0.0547	0.1745

Note: *t*-Values are in parentheses. The values of the variables used in these models are based on the average of each geographic segment over the period 1992–1998.

$$\text{Equation 5}: \ \beta_{xi} = \alpha_0 + \alpha_1 \text{EMINV}_i + \alpha_2 \text{EMOPH}_i + \alpha_3 \text{CFLOW}_i + \alpha_4 \text{INCST}_i + \alpha_5 \text{BSHEET}_i + \mu_i$$

.

*Significant at the 0.10 level.

**Significant at the 0.05 level.

***Significant at the 0.01 level.

Panel A of Table 5 shows the results for the full sample and two subsets of MNCs, those MNCs with positive and those with negative emerging market exchange rate exposure. Bartov and Bodnar (1994) recognize that grouping MNCs with negative exposure together with MNCs with positive exposure may be problematic since the MNCs are not uniformly influenced by the same factors. A firm with a negative (positive) exposure beta could be viewed as a net exporter (importer). Thus, we separately analyze these two subsets. Furthermore, Panel B of Table 5 explores whether regional differences exist.

When the full model is estimated for the full sample (i.e. without regard to the sign on the emerging market exchange rate exposure beta, β_x), EMOPH and INCST are found to be statistically significant. Although, when the subsets are analyzed, it appears that the significance of these two variables is driven by the subsample of MNCs with positive exposure betas. Thus, we find some evidence that greater imbalance (EMOPH) is associated with greater exposure, which is consistent with the results of Martin et al. (1999). We also find that exposure is greater for MNCs with greater translation effects (INCST) on their income statement. In both of the subsets examined, we also reveal EMINV to be significant, which is consistent with the work by Jorion (1990). Overall, there is support for hypothesis H2.

In Panel B, regional subsets are examined. In order to maintain reasonable degrees of freedom, these cross-sectional analyses are conducted using a reduced model. Since the CFLOW and BSHEET variables are not significant in Panel A, we omit these particular variables from the regional analyses. The results for the reduced model for each of the three regions are presented in Panel B. EMOPH is shown to be significant for the South America subset and marginally significant for the Middle East subset. Thus, the significance of EMOPH for the full sample (Panel A) appears to be largely influenced by the MNCs with South American operations and to a lesser extent by the MNCs with Middle Eastern operations.

Assessing Residual Stock Returns

Table 6 details the results of the analyses that assess the usefulness of the accounting and economic exposure factors derived from financial statements in explaining residual stock returns. Panel A of Table 6 reports the results for the full sample and for two subsets. The first subset contains only those cases when emerging market exchange rate exposure is statistically significant.[13] The second subset contains only those cases when emerging market exchange rate exposure is determined to be the greatest.[14] Essentially, this second subset contains only those cases where exchange rate exposure is economically important. All three

Table 6. Results of Assessing Residual Stock Returns.

Panel A: Full Sample and Subsets

Variable	Full Sample	Significant[a] β_x	Highest[b] β_x
Intercept	−0.0341 (−0.50)	−0.1435 (−1.24)	0.0053 (0.06)
EMINV	0.0001 (1.14)	0.0005 (1.31)	0.0001 (0.49)
EMOPH	−0.0001 (−0.58)	−0.0001 (−0.21)	−0.0002 (−0.89)
CFLOW	−0.0001 (−1.09)	−0.0001 (−0.17)	−0.0003 (−1.67)*
INCST	0.0003 (2.28)**	0.0009 (2.15)**	0.0004 (1.91)*
BSHEET	0.0000 (0.51)	0.0002 (0.60)	0.0002 (0.95)
N	535	223	356
F	1.55	1.33	1.71
Adjusted R^2	0.0051	0.0073	0.0099

Panel B: Regional Subsets

Variable	South America	Africa	Middle East
Intercept	−0.0832 (−0.91)	−0.2032 (−1.54)	0.1029 (0.38)
EMINV	0.0003 (1.65)*	0.0013 (1.58)	−0.0033 (−1.20)
EMOPH	−0.0000 (−0.01)	0.0010 (1.26)	−0.0018 (−0.55)
CFLOW	−0.0002 (−0.80)	0.0005 (0.68)	−0.0034 (−1.16)
INCST	0.0004 (1.86)*	0.0018 (2.01)*	0.0037 (1.04)
BSHEET	0.0000 (0.17)	0.0000 (0.04)	0.0032 (1.19)
N	350	114	71
F	1.01	0.98	1.71
Adjusted R^2	0.0002	−0.0007	0.0481

Note: *t*-Values are in parentheses. The values of the variables used in these models are based on the average of each geographic segment over the period 1992–1998.

$$\text{Equation 7}: \ \text{CAR}_{it} = \lambda_0 + \lambda_1 \text{EMINV}_{it} + \lambda_2 \text{EMOPH}_{it} + \lambda_3 \text{CFLOW}_{it} + \lambda_4 \text{INCST}_{it} + \lambda_5 \text{BSHEET}_{it} + \omega_{it}$$

[a] Observations where β_x are significant at the 10% level are included in this subset.
[b] The bottom third of the sample, in terms of the absolute value of exchange rate exposure, is omitted.
* Significant at the 0.10 level.
** Significant at the 0.05 level.

analyses show only INCST to be statistically significant. This finding shows that greater residual returns are generated when there are larger, positive effects of exchange rate movements on the income statement. Thus, there is some support for hypothesis H3.

Panel B of Table 6 evaluates whether regional differences exist. INCST is found to be marginally significant for the South America and Africa subsets. EMINV is also shown to be marginally significant for the South America subset.

Table 7. Results of Assessing Emerging Market Earnings Quality.

Panel A: Full Sample and Subsets

Variable	Full Sample	Significant[a] β_x	Highest[b] β_x
Intercept	−0.2001 (−5.34)***	−0.2817 (−4.35)***	−0.2528 (−5.07)***
UEEM	0.0003 (3.65)***	0.0012 (3.13)***	0.0005 (2.64)***
UENON	0.0005 (5.62)***	0.0016 (4.30)***	0.0012 (5.84)***
N	509	218	337
F	22.87***	12.58***	21.37***
Adjusted R^2	0.0793	0.0964	0.1081

Panel B: Regional Subsets

Variable	South America	Africa	Middle East
Intercept	−0.1890 (−4.20)***	−0.1218 (−1.92)*	−0.3743 (−2.70)***
UEEM	0.0006 (3.40)***	0.0017 (2.41)**	0.0012 (0.44)
UENON	0.0006 (3.31)***	0.0015 (2.06)**	0.0116 (4.27)***
N	335	109	65
F	12.52***	4.28**	9.15***
Adjusted R^2	0.0645	0.0573	0.2030

Note: Equation (8): $\mathrm{CAR}_{it} = \nu_0 + \nu_1 \mathrm{UEEM}_{it} + \nu_2 \mathrm{UENON}_{it} + \delta_{it}$.

[a] Observations where β_x are significant at the 10% level are included in this subset.

[b] The bottom third of the sample, in terms of the absolute value of exchange rate exposure, is omitted.

Assessing Earnings Quality

First, we examine whether geographic segment data are useful for financial market participants to assess earnings quality. Panel A of Table 7 reports the results for the full sample and the same two subsets shown in the previous table. Panel B provides the earnings quality assessment for each regional subset.

For the all three samples examined in Panel A of Table 7 and all three regions examined in Panel B, UENON is positive and significant. Thus, we find UENON to be value-relevant regardless of the subset examined. UEEM is also positive and significant for every subset, except for the Middle East subset. Finding UEEM to be significant for the full sample and for the two largest regions, South America and Africa, indicates that the geographic segment data are useful to assess earnings quality.

Second, we examine whether emerging market earnings are less value relevant than non-emerging market earnings. For the full sample (Panel A), the size of the coefficient for UEEM is significantly smaller than the coefficient for UENON, at the 10% level using an *F*-test. This finding provides some support for our hypothesis H4, that the quality of emerging market earnings is significantly lower

than non-emerging market earnings. Thus, even though both emerging market and non-emerging market unexpected earnings provide relevant information to the market, we find that emerging market earnings information is less value-relevant than non-emerging market earnings information. This support for our hypothesis is reinforced in the second subset of Panel A that contains only those cases where exchange rate exposure is economically important. Here we also find that the size of the coefficient for UEEM is significantly smaller, at the 1% level, than the coefficient for UENON. Thus, the earnings quality difference is most apparent for those firms with economically important exchange rate exposure.

SUMMARY AND IMPLICATIONS

Assessing risk and return requires understanding a variety of uncertain future conditions inherent to the firm's operations. Understanding the extent of operations in different geographic areas is useful in assessing the risk and return of multinational corporations (MNCs). The Financial Accounting Standards Board (FASB) recognized the value of geographic disclosure and required its inclusion in financial statements when it issued SFAS No. 14, effective for fiscal years beginning after December 15, 1976. Although many argue the disclosures under SFAS No. 14 were less than perfect, prior research finds evidence that the information is useful in security valuation (see Ahadiat, 1993; Balakrishnan et al., 1990; Boatsman et al., 1993). However, the FASB has recently changed its requirements and detailed geographic segment disclosure is no longer required.

Using a sample of U.S.-based MNCs operating in emerging markets, we provide further evidence that geographic segment data are useful since these data help to characterize exchange rate exposure, explain residual stock returns, and discern differences in earnings quality. Taken together, these analyses indicate that geographic disclosure is beneficial for shareholders in assessing the unique risks and returns of operating in emerging markets.

NOTES

1. As defined in Statement of Financial Accounting Concepts No. 2 (FASB, 1980a, b), useful accounting information helps "investors and others assess the amounts, timing, and uncertainty of prospective net cash inflows . . ." (p. 22). It further states that the characteristics of relevance and reliability can be used to distinguish more useful from less useful

information. Relevance is defined as accounting information that can make a "difference in a decision by helping users to form predictions about the outcomes of past, present, and future events . . ." (p. 47).

2. Earnings quality measures how well reported earnings reflect cash flows ultimately received by the investors (Stickney, 1993). The importance of the connection between earnings and cash flows is recognized in the Statement of Financial Accounting Concepts No. 1 (FASB, 1978) which states that the "ability to generate favorable cash flows leads primarily to an interest in information about its [the company's] earnings . . ." (p. 43).

3. It should be noted that the examination period of this study is 1992–1998. It is likely that availability of forward exchange contracts and non-deliverable forward contracts were even more limited during this period.

4. We do not use the translation adjustment reported on the income statement because the amount is not available for most of the companies in our study. We find that the translation adjustment is combined with other items on the income statement because it is not material enough to warrant separate income statement disclosure.

5. In addition, the majority of MNCs operating in the emerging markets studied here must use the U.S. dollar as the functional currency because they operate in high inflation areas. Therefore they do not record translation effects on the balance sheet. In this study 89% (79 out of 89) of the MNCs use the U.S. dollar as the functional currency.

6. See Kothari (2001) for a detailed summary and review of empirical capital market research.

7. We were unable to include any Asian emerging market segments because the segments were almost always labeled "Asia," which likely includes Japanese operations. We identified only one company that disclosed operations for the Philippines and met our other criteria. We excluded this company because the regional analyses we conduct are not meaningful with only one company.

8. Following Jorion (1990), Allayannis and Ofek (2001), and others, we use actual exchange rate changes as a proxy for unexpected movements in exchange rates.

9. The analyses are also conducted using CARs that are accumulated for 12 months ending three months following the MNC's fiscal year-end month in the event that information may be delayed due to the typical three month delay in annual financial statements (Bartov, 1997; Basu, 1983; Ou & Penman, 1989). We omit these results since there is no improvement in detecting significant relationships.

10. Earnings is defined as (primary) earnings per share before extraordinary items, adjusted for stock splits and stock dividends. The terms earnings and earnings per share are used interchangeable in this paper. The data of interest are earnings per share and earnings component per share, unless otherwise noted.

11. Significance is defined as p-value ≤ 0.10.

12. Although the sample contains 89 MNCs, the three subsets sum to 111 because there are 20 MNCs that report data for two of the emerging market regions, and one MNC that reports data for all three of the emerging market regions.

13. We classify the exposure as significant based on whether significant exposure is detected for at least one of the emerging market currencies where the MNC discloses business activity.

14. The bottom third of the sample, in terms of the absolute value of exchange rate exposure, is omitted.

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VOLUNTARY DISCLOSURES IN AN EMERGING CAPITAL MARKET: SOME EVIDENCE FROM THE ATHENS STOCK EXCHANGE

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ABSTRACT

Prior research has pointed to the need to subdivide aspects of voluntary disclosure rather than treat this as an amorphous mix. However, questions about the relative reasons for the variations observed across categories of voluntary disclosure remain open to investigation. This paper contributes to that investigation in the context of a European emerging capital market. Three categories of voluntary disclosure are developed (namely, corporate environment, social responsibility and finance-related disclosures) and each category is tested for association with seven company-specific variables (corporate size, gearing, profitability, liquidity, industry, share return and listing status) in the annual reports of 87 companies listed on the Athens Stock Exchange (ASE). The extent of voluntary disclosure is relatively low. Using linear regression analysis, different explanations are found for the separate categories of disclosure based on prior evidence. Interpretation and analysis are offered in the context of the operation of the ASE.

Advances in International Accounting
Advances in International Accounting, Volume 17, 227–250

ISSN: 0897-3660/doi:10.1016/S0897-3660(04)17011-6

INTRODUCTION

It has been suggested that a company's decision to engage in voluntary disclosure might be a response to innovation, globalization or changes in business and capital market environments (Healy & Palepu, 2001). Relatively little research has been published on the role of voluntary disclosure in the emerging capital markets of continental European countries.[1] The opportunity to explore voluntary disclosure at a time of major change in the capital market environment motivates our investigation of voluntary disclosure in Greece at a time of significant change in that country's capital market.

Our analysis follows the approach of Meek et al. (1995), which suggested the separation of voluntary disclosures into categories reflecting variations in decision relevance for users. Their analysis was applied to multinational companies operating in developed capital markets. More recently their approach was followed by Ferguson et al. (2002) in a comparison of China and Hong Kong. We continue that exploration of emerging markets by asking the question: What factors are associated with different categories of voluntary disclosure by companies listed on the Athens Stock Exchange (ASE)?

The contribution of the paper is to extend the analysis of Meek et al. (1995) and Ferguson et al. (2002) to an emerging capital market of continental Europe and to offer explanations related to theories of voluntary disclosure. For our study of voluntary disclosure in Greece we choose the particular case of 1997 that was a year of abrupt changes in stock prices and market capitalization. The general price index of the ASE increased by 60% in 1997 over the previous year (ASE, 1998). Shortly before, or during, 1997 a large number of companies entered the market for the first time, while many of those already listed raised new capital from the capital market (ASE, 1998). These changes in activity were due to important amendments to stock exchange legislation and to the partial privatization of the stock exchange (ASE, 1998). New markets were established under the regulation of the ASE, economic fundamentals improved which brought down interest rates, and the challenges of the single currency and international markets were recognized by the Greek business community.

ACCOUNTING REGULATION AND MARKET DEVELOPMENT IN GREECE

Financial reporting regulation in Greece is formed and managed by the government. The major bodies issuing rules are the Parliament and the Ministries of Finance, Trade and the National Economy. The National Council of Accounting

(ESYL) and the Accounting Books Committee (ELB) have an influence on accounting. The most important sources of regulation for companies listed on the ASE are found in the Stock Exchange Law, the Company Law, the General Accounting Plan, and the Tax Laws.

The reporting obligations of listed companies are based on the Stock Exchange Law (SE Law 1806/88) and on the succeeding Presidential Decrees (PD). The ASE operates in accordance with all EU capital market directives. Companies that wish to be listed on the ASE have to comply with certain conditions. They must have published audited annual accounts for the preceding five years. These accounts must demonstrate satisfactory operating profits and financial structure. Companies have to present a tax audit for the relevant accounting years. Companies must submit a prospectus that includes financial statements for the previous five years, information on share capital development, dividends paid out, and other financial matters. The ASE board of directors may impose any additional requirements deemed necessary for the approval of the prospectus.

Accounts in Greece provide fiscal and legal information. Annual accounts are drawn up in compliance with the Company Law (known as 2190/1920). The Company Law, as amended in 1986 and 1987 to incorporate the Fourth (PD 409/86) and the Seventh (PD 498/87) Directives, includes provisions on the type and layout of annual accounts, the management report, the contents of the notes, the valuation rules, and also provisions on the publication process. The General Accounting Plan (Law 1041/80; PD 1123) specifies the content of accounts. The General Accounting Plan was significantly influenced by the French *Plan Comptable Général* although it is considered more flexible. Tax Laws (1258/92-Code of Books and Records, 2065/92-Income Tax on Corporations and Individuals) also influence financial reporting. Financial statements should be published within six months of the end of the fiscal year.

In addition to annual accounts, all listed companies must publish interim and quarterly accounts within two months of the end of the fiscal period to which they refer (Law 2533/1997). Shareholdings of more than 10% should be reported to the ASE, as should any increase greater than 1.5% during the first 12 months of the company's listing. Listed companies that do not comply with their reporting obligations may be delisted from the ASE. International Accounting Standards are not influential in Greece and are used only by companies that seek funding in international markets (Vlachos, 2001).

The data for this study is taken from 1997 annual report because 1997 was a year of significant change in the Athens Stock Exchange. Turnover increased from 1,990.01 billion GRD in 1996 to 5,802.03 billion GRD in 1997 (ASE, 1998). Share issues to raise new capital increased from 150.45 billion GRD in 1996 to 531.20 billion GRD in 1997. This marked a move from traditional bank-based

finance to greater reliance on the equity market. It was the point where market participants became more sensitive to information issues and the ASE began to consider its responsibilities towards investors. Institutional changes that affected investment opportunities and risk-return were considered to be sound bases for the further development of ASE securities (Barkoulas & Travlos, 1998).

HYPOTHESIS DEVELOPMENT

Our hypotheses are expressed in terms of independent variables and are grouped, following Lang and Lundholm (1993), into:

- Structure-related variables: size (market capitalization) and gearing (long term debt to equity);
- Performance-related variables: profitability (return on equity) and liquidity (current ratio); and
- Market-related variables: share return, industry (consumer products, industrial products and services); listing status (parallel market, main market).

Our expectations for each variable are derived from considerations of relevant theory, from evidence of prior research and from particular expectations regarding the capital market in Greece. Hypotheses are expressed in alternative form. Variables are summarized in Table 1.

Structure-Related Variables

Structure-related variables are those corporate characteristics that are likely to remain stable over time (Lang & Lundholm, 1993). In this paper, they are represented by size and gearing.

Corporate Size

Size is the variable most frequently found in disclosure studies, since it has repeatedly been identified as a significant explanatory factor. However, it proxies many theories (Ball & Foster, 1982). As a result, interpretation becomes complex. Agency theory (Jensen & Meckling, 1976) associates agency costs with the separation of management from ownership, which is likely to be greater in larger companies. Large companies are more visible than smaller ones and, in turn, more exposed to political attention (higher taxes, price controls, social responsibility). Hence, large companies are more likely to adopt strategies to reduce those political costs (Hagerman & Zmijewski, 1979; Watts & Zimmerman, 1978). Size

Table 1. Independent Variables.

Variable	Measure
Structure-related variables	
Total assets	Fixed assets plus current assets
Number of employees	As indicated in annual report
Market capitalization	Based on closing prices at 31 December 1997, ASE data
Gearing	Long term debt to equity (book values)
Performance-related variables	
Profitability	Return on assets, calculated as net income divided by total assets
Liquidity	Current assets divided by current liabilities
Market-related variables	
Industry	Consumer product (37), industrial product (34), services (16) Dummy variables: 1 = Consumer product, 0 = industrial or service 1 = Industrial product, 0 = consumer or service 1 =Service, 0 = consumer or industrial[a]
Share return	ASE data: One-year return, calculated as $\left\{\frac{(1+R)\text{ closing price on }31.12.97}{\text{closing price on }31.12.96}\right\}-1$ where: R = dividend/share price at ex-div day
Listing status	ASE data: Dummy variable. 1 = Main market (75 companies), 0 = Parallel market (secondary market, 12 companies)

Source: 1997 annual report unless stated otherwise.

[a] Dummy variables were included in the equation for consumer product vs others and for industrial product vs. others. It was not necessary to include service vs. others in the Eq. (see Meek et al., 1995) because the significance of service companies may be deduced from the significance of the other two industries.

has been used as a proxy for political costs by several studies (e.g. Holthausen & Leftwich, 1983).

It is expected that lower information costs (Verrecchia, 2001) for large companies and their investors will lead to a positive correlation between size and disclosure. Furthermore, larger companies that disclose information tend to have a lower competitive disadvantage than smaller companies (Dye, 1985; Meek et al., 1995). Larger companies may have a more intense impact on society, they are more capital market oriented and they have greater analyst following, which makes them more open to providing information (McKinnon & Dalimunthe, 1993). Our expectation, based on prior studies, is for a positive relation between size and extent of disclosure. This paper measures size by market capitalization (see e.g. Hossain et al., 1994).

H_1. Voluntary disclosure is positively associated with size, measured by market capitalization.

Gearing

Agency costs (Jensen & Meckling, 1976) are expected to increase with gearing because the wealth transfer from debt-holders to managers and shareholders increases with gearing. Thus, highly geared companies may disclose more information to satisfy the needs of long-term creditors (Malone et al., 1993) and also to remove the suspicions of debt-holders regarding wealth transfer (Myers, 1977). In addition, a highly geared company has a greater obligation to satisfy the needs of long-term creditors for information (Wallace et al., 1994). However, applying the rationale of signaling theory (Akerlof, 1970) it could be argued that lower-geared companies may wish to draw attention to their financial structure by giving more voluntary disclosure. Hossain et al. (1995) found a significant positive association between gearing and disclosure. In contrast, Chow and Wong-Boren (1987), Hossain et al. (1994), Meek et al. (1995), Raffournier (1995), Inchausti (1997) and Patton and Zelenka (1997) found no significance. We have no specific expectation of the direction of association.

H_2. Voluntary disclosure is associated with gearing.

Performance-Related Variables

Performance-related variables are time-specific, representing information to which management may have preferential access, and which is likely to be subject to disclosure within the reporting period (Lang & Lundholm, 1993). In this paper, they are represented by profitability and liquidity.

Profitability

Agency theory suggests that managers of very profitable companies will use external information in order to obtain personal advantages like continuance of their positions and compensation arrangements (Inchausti, 1997). Profitable companies may disclose more information in order to be distinguished from less profitable companies, following a signaling scenario (Akerlof, 1970). However, it may be the case that less profitable companies may disclose more information to explain the reasons for negative performance and reassure the market about future growth. It may also be the case that companies, by disclosing "*bad news*," reduce the risk of legal liability, severe devaluation of share capital and loss of reputation (Skinner, 1994). Profitability has been used as a variable in many studies. Singhvi and Desai (1971), Patton and Zelenka (1997), and Owusu-Ansah (1998) found a significant association. In contrast, McNally et al. (1982), Malone et al. (1993), Wallace et al. (1994), and Meek et al. (1995), found no association. In view of

the mixed evidence from prior research, we have no specific expectation about the direction of association with profitability.

H_3. Voluntary disclosure is associated with profitability.

Liquidity

Liquidity may be viewed as a measure of risk. The ability of a company to meet its short-term financial obligations without having to liquidate its long-term assets or cease operations is an important factor in the evaluation of the company by interested parties such as investors, lenders and regulatory bodies (Wallace & Naser, 1995). Companies that have strong liquidity may disclose more information to distinguish themselves from less financially strong companies. The rationale for this variable lies in signaling theory (Belkaoui & Kahl, 1978). However, the relationship between liquidity and voluntary disclosure may not be straightforward. Wallace et al. (1994) observed significant correlation. No association was reported by Wallace and Naser (1995), and Owusu-Ansah (1998). In view of the mixed evidence from prior research, we have no specific expectation about the direction of association with liquidity.

H_4. Voluntary disclosure is associated with liquidity.

Market-Related Variables

Market related variables are either time-specific or relatively stable over time, and they are either within or outside the control of the company (Wallace et al., 1994). They are represented in this paper by industry factor, share return, and listing status.

Industry Factor

Industry has been identified by theoretical and empirical research as a factor with explanatory potential for voluntary disclosure. Industries have different characteristics which may relate to competition, product differentiation, industry structure (e.g. oligopolies), growth, demand instability, quasi-legal constraints, risks and also to the specific culture which may be related to historical factors (Hambrick & Abrahamson, 1995). These may provide scope for differential disclosure policy as suggested by Dye and Sridhar (1995). Furthermore, the existence of a dominant company in an industry with high levels of voluntary disclosure may have bandwagon effects for all companies within this industry. This "*follow the leader effect*" has been detected in many studies of accounting disclosure (e.g. Belkaoui & Kahl, 1978; Cooke, 1991).

Moreover, different industries have different proprietary costs that give incentives for companies belonging to the same industry to disclose either more or less (Verrecchia, 1983). Industry may also affect the political vulnerability of a company (Watts & Zimmerman, 1986, p. 239). Results for industry effects tend to differ. While Belkaoui and Kahl (1978), Cooke (1989), Meek et al. (1995), found significance, Raffournier (1995), Patton and Zelenka (1997) and Inchausti (1997) found no significance for the industry factor. In view of the mixed evidence from prior research, we have no specific expectation about the direction of association with industry type.

H_5. Voluntary disclosure is associated with industry type.

Share Return

A positive association between share returns and disclosure has been suggested in the literature (Horngren, 1957). It has been also argued that higher information asymmetry between market participants leads to higher transaction costs and lower liquidity which raises the required rate of return and lowers current stock prices (Bartov & Bodnar, 1996). In the context of signaling theory the view could be that high return companies may wish to distinguish themselves from low return companies. Our expectation is that there will be a positive association between voluntary disclosure and share return.

H_6. Voluntary disclosure is positively associated with share return.

Listing Status

Listing status has been proposed in many studies as a factor explaining variability in accounting disclosure. Fama and Jensen (1983) argue that stock exchange listing is a mechanism for mitigating incentive conflicts between contracting parties. Cooke (1991) suggests that companies with different listing status may disclose different levels of voluntary information because they may have different objectives in raising capital. Companies having a listing status, or a more prestigious listing status, may be more willing to disclose enhanced voluntary information in annual reports. The significance of listing status has been supported empirically by Cooke (1989, 1991), Wallace et al. (1994), Hossain et al. (1994), Hossain et al. (1995), Meek et al. (1995) and Inchausti (1997). Our expectation is that there will be a positive association between voluntary disclosure and listing status.

H_7. Voluntary disclosure is positively associated with listing status.

Based on the above, the regression equation takes the following form:

$$\begin{aligned} \mathrm{VDI}_{ij} = {} & \beta_0 + \beta_1 \mathrm{Size}_j + \beta_2 \mathrm{Gearing}_j + \beta_3 \mathrm{Profitability}_j \\ & + \beta_4 \mathrm{Liquidity}_j + \beta_5 \mathrm{Consumer\,Product}_j + \beta_6 \mathrm{Industrial\,Product}_j \\ & + \beta_7 \mathrm{Share\,Return}_j + \beta_8 \mathrm{Listing\,Status}_j + u_{ij} \end{aligned} \quad (1)$$

where: VDI_{ij} = the Voluntary Disclosure Index (VDI) scores for sampled companies i = number of indices according to overall and three categories of disclosure $(1, \ldots, 4)$ j = number of company $(1, \ldots, 87)$.

DATA COLLECTION AND RESEARCH METHODS

Data Collection

The sample consists of 87 Greek language annual reports of non-financial publicly traded companies listed on the ASE. The annual reports had year-ends of 31 December 1997. Financial companies were excluded from the sample due to different regulations affecting their reporting practices. Companies that became listed for the first time (or changed their listing status) in 1997 were also excluded. Omission of newly listed companies follows Owusu-Ansah (1998). The sample represents 47% of non-financial companies in the market by number (calculated as 87/185).[2]

The composition of the sample is summarized in Table 2.

Obtaining annual reports of Greek companies necessitates an approach to the companies. Contact methods included first and second letters, fax and telephone enquiry. The difficulty of obtaining annual reports reflects inherent secrecy and the unwillingness of companies to provide annual reports for non-shareholders.

Table 2. Sample Size and Nature.

Description	Overall
Companies listed in 1997	227
Financial companies	42
Non-financial companies	185
Companies responding	94
Companies newly listed in 1997	7
Final sample	87

Disclosure Index

A specific voluntary disclosure index was developed for this project, to capture voluntary disclosure that was relevant to the Greek market and to exclude items contained in accounting regulation (as described earlier). The initial version of the list was based on Meek et al. (1995). They used three categories namely strategic, non-financial and financial information. We have moved information about directors from the non-financial category and added it to strategic information because we felt that information about directors was more closely related to corporate strategy than to disclosures relating to social responsibility. Our paper uses three categories, labeled corporate environment, social responsibility and financial information. The disclosure list of Meek et al. (1995) was enhanced by adding items used in other prior studies to give an element of comparability. All items were then checked against accounting regulations in Greece to eliminate mandatory items. A pilot study based on four annual reports from each of the three industry groups of this study led to final modification for the Greek reporting environment. A firm of experienced external auditors in Greece confirmed that all the items in the checklist were valid voluntary items, not covered by any regulation (see Appendix for the full checklist).[3] The three categories of disclosure items are described as follows.

(1) Corporate environment information has a strategic element. and particular areas may be especially relevant to investment decisions (Anderson, 1981). The main purpose of this type of information is to provide users of accounts with further expectations about the operations of the company, the main corporate strategies and managerial considerations about factors affecting business. Management making use of this type of disclosure may wish to improve the image of the company, decrease information asymmetries and also explain corporate issues to stakeholders, such as general information about the economic environment, general corporate information, specific corporate information and information about the directors.
(2) Social responsibility information, mainly about employee matters and social policy, could result from a range of motives. Political and economic factors, decision-making and users' demand may affect this type of disclosure. Employee information is considered to be of particular importance to labor unions, employees and also governmental and non-governmental groups. Various external groups are interested in the quality of human resources since in modern business, profitability and business success depend crucially upon the quality of the labor force. Social policy information has a strong ethical nature and so could be seen as being provided for reasons of legitimacy.

Voluntary disclosure in the annual report may be used to reinforce the community's perception of management's responsiveness to specific social responsibility issues and to legitimize corporate actions (Guthrie & Parker, 1989; Patten, 1992; Wilmshurst & Frost, 2000).

(3) Finally, financial information refers to quantitative matters that improve the overall understanding of the factors that play a role in the performance and future growth of the company and may be of particular relevance for decision-making. This type of information may be of particular relevance to existing and potential investors. Financial information in this study refers to segmental disclosure, financial ratios, financial review and market-related information.

In scoring the disclosures, we applied the most commonly used method from prior research, which is to score items without weighting for relative importance. This method of scoring focuses on the relative extent of the disclosure rather than introducing additional subjectivity through weighting users' perceptions of relative usefulness (Cooke, 1989; Cooke & Wallace, 1989; Naser & Al-Khatib, 2000). Some disclosure studies have applied weightings based on analysts' opinions (Buzby, 1975; Cerf, 1961; Malone et al., 1993; Singhvi & Desai, 1971; Stanga, 1976), but others have tested weighted and unweighted indices and found similar results (Chow & Wong-Boren, 1987; Zarzeski, 1996). The dichotomous scoring awards one (1) if companies disclose a certain item and zero (0) if they do not disclose it but it is applicable to that company. The disclosure score for each company is measured by the ratio of actual items disclosed, divided by the maximum possible items that could have been disclosed. This approach has been followed by the majority of the disclosure studies (e.g. Cooke, 1989, 1991; Gray et al., 1995; Wallace & Naser, 1995).

In order to avoid penalizing a company for which the particular disclosure items are inapplicable, this study follows Cooke (1989) and Owusu-Ansah (2000), who both suggested a meticulous review of the entire annual report in order to specify items that are inapplicable.

RESULTS

Descriptive Statistics

Table 3 reports the descriptive statistics for the dependent and independent variables. The table indicates that the level of overall disclosure in the sample companies is relatively low at 37.57%. Moreover, it appears that the level of voluntary disclosure varies materially across the three categories ranging from

Table 3. Descriptive Statistics.

	Mean	Std. Dev.	Minimum	Maximum
Dependent variables				
Overall disclosure	0.3757	0.1577	0.02	0.76
Corporate environment	0.5871	0.2024	0.04	0.92
Social responsibility	0.1475	0.2100	0.00	0.84
Financial	0.3086	0.1718	0.00	0.76
Independent variables				
Total assets (m GRD)	44,530	183,195	368	1,713,952
Number of employees	693	2,629	7	24,481
Capitalization (m GRD)	63,663	289,452	861	2,640,235
Gearing	0.1405	0.2556	0	1.4617
Profitability	0.0944	0.1132	−0.472	0.6007
Liquidity	1.8873	1.3120	0.5124	8.4104
Share return	0.3557	0.6756	−0.641	3.2809

58.7% for corporate environment to 14.8% for social responsibility information. It is also evident that sample companies vary considerably in both the dependent and the independent variables.

To carry out regression analysis, the data were transformed into ranks because the assumptions of ordinary least squares could not be fulfilled. Although there are many possible transformations, ranks have been found to have many advantages. By construction, they are distribution free (Cooke, 1998) and they mitigate the impact of measurement errors, outliers and heteroscedastisity (Cheng et al., 1992). Furthermore, there is sufficient theoretical and empirical evidence about the efficiency of these methods (Cooke, 1998; Draper, 1988; Lang & Lundholm, 1993, 1996; Wallace & Naser, 1995). Percentile ranks are reported.

Collinearity diagnostics suggested that size variables were highly correlated, and when data were transformed, the collinearity due to size measures was at critical values.[4] We chose market capitalization as a single size measure to use across the study, based on minimization of mean square error resulting from trials of alternative measures of size.

Results and Analysis

This paper is primarily concerned with identifying each of the disclosure index categories. The adjusted R squared (Adj R^2) suggests that 35.6% of the overall disclosure variation is explained by the independent variables (see Table 4). The single most significant variable overall is size measured by market capitalization.

Table 4. Regression Results.

Variable	Overall Disclosure			Corporate Environment			Social Responsibility			Financial Information		
	t	Sig. *t*	VIF	*t*	Sig. *t*	VIF	*t*	Sig. *t*	VIF	*t*	Sig. *t*	VIF
Capitalization	4.832	0.000	2.012	3.967	0.000	1.984	3.664	0.000	1.984	4.163	0.000	2.012
Gearing	1.022	0.310	1.318	1.384	0.170	1.384	−0.610	0.544	1.384	0.595	0.553	1.318
Profitability	1.661	0.101	1.854	0.537	0.593	2.036	0.446	0.657	2.036	1.490	0.140	1.854
Liquidity	−1.492	0.140	1.693	−1.543	0.127	1.596	−1.207	0.231	1.596	0.092	0.927	1.693
Consumer products	2.137	0.036	2.255	2.005	0.048	2.344	1.543	0.127	2.344	0.528	0.599	2.255
Industrial products	2.242	0.028	2.533	1.980	0.051	2.622	1.613	0.111	2.622	0.740	0.461	2.533
Share return	−2.505	0.014	1.951	−2.224	0.029	2.064	−1.996	0.049	2.064	−2.333	0.022	1.951
Listing status	2.557	0.130	1.218	1.752	0.084	1.226	1.541	0.128	1.226	2.013	0.048	1.218
(Constant)	−0.231	0.818		−2.439	0.017		−1.900	0.061		0.485	0.629	
Adj R^2		0.356			0.223			0.154			0.293	
MSE		0.0548			0.713			0.628			0.060	
F-value		6.884			4.047			2.938			5.413	
Adj R^2 Ferguson et al. (2002)		0.34			0.25			0.15			0.33	
Adj R^2 Meek et al. (1995)		0.33			0.46			0.14			0.35	

Other significant variables are listing status and share return. The remaining independent variables are not statistically significant.

The subdivision of disclosure into three categories yields more insight into the overall voluntary disclosure. Table 4 shows that the amount of explained variation in information categories ranges from 29.3% for financial information to 22.3% for corporate environment information and 15.4% for social responsibility information. It may be seen from Table 4 that the independent variables have different levels of association with the three separate categories of voluntary information. That suggests that the explanatory power of each factor depends on the particular nature of each disclosure area, consistent with Meek et al. (1995). Table 4 also compares the adjusted R^2 of this study with the values obtained by Meek et al. (1995) and Ferguson et al. (2002).

Corporate Environment

The significant size effect detected may be consistent with considerations of information cost and capital need. Larger companies may disclose more corporate environment information because it is less costly for them to do so in terms of both non-proprietary and proprietary cost factors. Additionally, larger companies may be more inclined to disclose more information of this type because they face greater market pressures and they have a stronger dependence on external capital. They also have more analysts following them. Gearing has a positive sign, reflecting the predictions of agency theory, but is not significant. It seems that agency as hypothesized by gearing may not be very strong in the case of Greece. The extensive shareholding by families in Greece (Papas, 1993) would lend support to the view that agency is not a strong factor. Share return is significant, but with a negative sign which is the opposite of our prior expectation. It appears that companies with lower share returns may wish to disclose more information in relation to corporate environment, possibly to counter the bad news. Profitability and liquidity are not significant, so there is no support here for signaling theory.

Finally an industry effect has been found in this category. Consumer product companies disclose significantly more than other companies (at the 5% level) and industrial product companies disclose significantly more than other companies (at the 10% level). This means that service companies disclose least and are significantly lower than either of the other two groups.[5] Differences in the fundamental characteristics of the service industry may account for differential disclosure of information relating to the corporate environment. Consumer product companies and industrial product companies are more in the public eye due to the nature of their business that may cause higher disclosure. A follow-the-leader or follow-the-rival effect in specific sub-sectors may also determine similar disclosure by companies in the same industry.

Social Responsibility

Size and share return are the only significant factors in this category. It appears that disclosure of social responsibility information is carried out mainly by larger companies, consistent with the findings of prior studies (e.g. Deegan & Gordon, 1996; Gray et al., 1995). That may be because larger companies have a major impact on society and may wish to discharge their social accountability (see Gray et al., 1987). Larger companies are more concerned about their public image and they may be more inclined to use marketing tools in order to influence perceptions. Some analysts tend to take account of social responsibility disclosures in their investment decisions (e.g. Benjamin & Stanga, 1977; Ingram, 1978). Another pressure towards this kind of information is the increased concern of investment trusts for environmental and ethical issues (Rockness & Williams, 1988). Therefore, companies that are more sensitive to analysts' reactions are more likely to provide these disclosures. These may be companies with greater analyst following, which in the case of Greece, are the largest companies. Share return is significant, supporting the view that economic performance is associated with social responsibility (see Shane & Spicer, 1983; Ullmann, 1985). Since profitability and liquidity are not significant here it could be concluded that strong signaling effects are unlikely to occur through social responsibility disclosures in Greece.

Financial Information

Table 4 shows that voluntary disclosure of financial information is explained by corporate size, share return and listing status. Corporate size is the most influential corporate factor. This result is consistent with many studies of voluntary disclosure (e.g. Gray et al., 1995). Larger companies tend to disclose more financial information for a variety of reasons, including lower costs of producing information. Large Greek companies have sophisticated information systems and produce relevant information for internal reasons, so the opportunity costs of disclosing this type of information are lower compared to small companies. Financial information may be more directly associated with proprietary cost, through disclosing information that could be helpful to competitors; large companies may fear these costs less than small companies and may be more inclined to disclose relevant information. Large companies are more likely to be orientated towards the capital market and to adopt practices desired by the investment community, because they need more external finance and have higher numbers of analysts following them.

The significance of listing status is consistent with Meek et al. (1995). Companies listed on the main market are more sensitive to the need to raise capital and therefore are more likely to respond to the pressures of investment analysts for this type of disclosure. The potential for reducing the information costs of investors, and the needs of listed companies for new capital, may also be relevant here.

Table 4 shows a negative association with share return. Companies experiencing negative share returns may provide more financial information in order to explain how the financial fundamentals of the company point to future progress of the company and a recovery of the share price. Financial information may be considered more relevant in supporting the directors' claims of recovery, which is also important for financial analysts (e.g. Benjamin & Stanga, 1977). The negative association with share return may be seen as an example of signaling "*bad news*," perhaps to ward off a severe reduction in market price and avoid a loss of corporate reputation. However, the evidence for signaling is limited because profitability and liquidity are not significant in this category. The explanation of the significance of share return may lie in accountability to investors and other users of accounts rather than in a signaling effect.

CONCLUSIONS

This study has investigated factors associated with voluntary disclosure in annual reports of listed companies at the start of a period of rapid change in an emerging national capital market. It has shown that different factors influence different disclosure categories. The adjusted R^2 statistics are comparable to those of Ferguson et al. (2002) but lower than Meek et al. (1995), suggesting that models applicable to developed capital markets need further adaptation to explain disclosure in developing markets.

The results of multivariate analysis indicated that company size and listing status were particularly strong. Size was the only variable that had explanatory power overall and in each of the three separate categories of information. Since size is a proxy for so many theoretical models we have to look further for theoretical insights. The significance of listing status, overall and in financial disclosures, allows us to suggest that capital need affects these areas of disclosure. The lack of signaling effects is seen in the limited significance of profitability and lack of significance of gearing and liquidity. The type of industry explained variations in disclosure overall and also variations in disclosures related to the corporate environment. Relative secrecy on the part of service companies may reflect a fear of incurring proprietary costs through disclosure to competitors. Share return was found to have explanatory power overall and also in relation to voluntary disclosure of social responsibility (at the 10% level) and financial information. We suggest that this reflects a concern for corporate accountability.

The model has explained 35.6% of the overall variation. Across the categories the range is from 29.3% for financial disclosures, through 22.3% for corporate environment disclosures, to only 15.4% of the variation in social responsibility

disclosures. It may be that social responsibility could be explained better with variables that capture accountability issues more directly. Although the model has explained a significant part of the variation in disclosure, there is still a material part unexplained which represents the "noise" of the model. Since disclosure theories are incomplete, particularly when countries other than the U.K. or U.S. are investigated, it seems that there remains a need to look further to find relevant theoretical propositions.

This study, based on empirical findings, has assumed that disclosure items have the same weight and that companies that are disclosing the most information will have selected the most important information. A survey focused on various groups of users of annual reports could provide further insights into the reliability of this assumption in the case of Greece. Another interesting approach could be to model voluntary disclosure in reference to the proprietary costs associated with those disclosures.

One note of caution is that the results should be viewed in relation to the particular features of the Greek accounting system in 1997, as a year marking significant change in the ASE. These features may change in subsequent years in the light of the rapid development of the ASE and also the process of economic and political harmonization process within the EU. Companies listed on the ASE are expected to improve their disclosure practices, such that voluntary disclosure will be influenced by managerial decisions and regulatory pressures. Listed companies are expected to reform their reporting practices following the modernization of the stock exchange. Furthermore, new provisions in the ASE regulation regarding disclosure and market efficiency imply a direct impact on information issues for listed companies. How far reaching these reforms might be is still an open question.

That may also have direct implications for the Greek accounting system, particularly when unlisted companies are concerned. One potential outcome is that the accounting practices of unlisted companies may not reflect those of listed companies. Taking into consideration the socio-economic environment of Greece, the particular objectives set for the accounting system (e.g. standardization) and the fact that the most companies are relatively small, it has been argued that regulation may be needed to correct such a practice (see Foster, 1986). The results also suggest that the regulators, at the time of this study, should have been particularly concerned with issues related to annual reports and particularly with information disclosures by service companies, small companies and those listed on the parallel market in order to ensure information adequacy and increasing efficiency of the rapidly developing capital market.

The current research has revealed the need to take account of additional variables that explain voluntary disclosure in settings different from the developed

capital markets. That may be because emerging markets may have different institutional characteristics. Additional variables could increase the explanatory power of separate categories of disclosure, particularly social responsibility disclosures. Factors that are thought to be influential but could not be operationalized in the current study could be a topic for further research. The quality of management, ownership structure, and supply of consultancy services to the companies are some examples.

NOTES

1. Adhikari et al. (2002) list country studies appearing in the *Journal of International Accounting, Auditing & Taxation*; none of these covers continental Europe (i.e. countries other than the U.K.).

2. The rate of response is low compared to the Anglo-Saxon corporate environment but considerably higher than many developed counties. For example Cooke (1991) reports a response rate of 24% by Japanese companies. In Greece until 1997 companies were very reluctant to provide accounts to non-shareholders since there was a tradition of high secrecy. The Stock Exchange was not developed and it was not the main source of capital. Discussions with other researchers and auditors in the Greek setting suggest that the response rate was very good for Greece. Companies were sent two letters, fax and were approached by telephone enquiry in order to weaken the resistance of non-respondents. A similar approach is taken by Wallace and Cooke (1990). Confidentiality was assured. A test that the non-respondents are distributed proportionately among the three industry categories indicates that there was no significant group biases. This is similar to the approach suggested by Wallace and Mellor (1988) and Wallace and Cooke (1990).

3. A copy of the disclosure checklist with sources is available on request to the first-named author.

4. Collinearity diagnostics tests used were: matrix, Variance Inflator Factors (VIF) and eigenvalues, all leading to the same conclusions. VIF results only are reported in this paper for reasons of economy.

5. If consumer products disclose significantly more than industrial products and services together, and industrial products disclose significantly more than consumer products and services together, then by logical argument services must disclose significantly less than either.

ACKNOWLEDGMENTS

We acknowledge the helpful comments on an earlier draft of this paper by Clare Roberts, Donald Sinclair and Terry Cooke. Suggestions by Stephen Owusu-Ansah are particularly appreciated. We are also grateful to two anonymous reviewers for their constructive advice.

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APPENDIX

Disclosure Index Checklist

No.	Category
	Corporate Environment
	General Information about the Economic Environment
1	Information about the influential activity of the State
2	Information about the economy
3	Information about the industry
4	Specific factors influencing business (technology-EU-politics)
	General Corporate Information
5	Brief history of company
6	Financial highlights statement
7	Information on products
8	Information on last years performance
9	Organizational structure
10	Description of marketing network
11	Overview of the major subsidiaries
12	Forward looking information
13	Graphs/Photos
	Specific Corporate Information
14	Statement of strategy and objectives-general
15	Specific statement of strategy and objectives (financial-marketing-social)
16	Impact of strategy on current results
17	Information on acquisitions/expansion of programs
18	Information on disposals/cessation
19	Productive capacity

APPENDIX (*Continued*)

No.	Category
20	Analysis of subsidiaries (brief history, operations, contribution)
21	Analysis of products
22	Description of capital project committed
23	Analysis of capital projects
	Information about Directors
24	Personal characteristics of directors (age, education etc)
25	Position or office held by executive directors
26	Remuneration
	Social Responsibility
	Employee Information
27	Information on geographical distribution of employees
28	Line of business distribution of employees (disaggregated)
29	Categories of employees (sex-function-age-education)
30	Categories of employees trained
31	Identification of senior management and their functions
32	Amount spent in training
33	Nature of training
34	Policy on training
35	Number of employees trained
36	Impact of training on results
37	Policy on human resources
	Social Responsibility
	Employee Information
38	Data on accidents
39	Safety measures
	Social Policy
40	Safety/quality of products (general)
41	Environmental protection programs-qualitative
42	Environmental protection programs-quantitative
43	Charitable donations
44	Community programs
45	Value added information

APPENDIX (*Continued*)

No.	Category
	Financial Information
	Segmental information
46	Geographical production
47	Geographical sales disaggregated
48	Line of business production
49	Line of business sales disaggregated
50	Competitor analysis
51	Market share analysis
	Financial ratios
52	Profitability ratios
53	Performance ratios
54	Gearing ratios
55	Liquidity ratios
56	EPS
57	Other ratios
	Financial Review
58	Qualitative comments on profitability
59	Expenditure on specific marketing projects
60	Contribution of subsidiaries
61	Statement of the accounting principles
62	Effects of foreign currency fluctuations on operations
63	Cash-flows
	Market Related Information
64	Share price at the year end
65	Share price trend
66	Market capitalization at the year end
67	Market capitalization trend
68	Size of shareholdings
69	Type of shareholders
70	Significant shareholders
71	Information on new issues
72	Dividend policy