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Name of publication: **THE INTERNATIONAL JOURNAL OF ACCOUNTING** (ISSN:0020-7063)
Office of publication: Elsevier Science Inc.
655 Avenue of the Americas
New York, NY 10010-5107

Published quarterly. Annual institutional subscription rates for 2001: European countries, NLG 565.00 (euro 256.39); all countries except Europe and Japan: US\$289. Associated personal price for 2001: all countries except Europe and Japan: US\$112.

POSTMASTER send address changes to:

Subscription Dept.: Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010-5107.

Editorial Office: Center for International Education & Research in Accounting
320 Wohlers Hall
1206 South Sixth Street
Champaign, IL 61820
217-333-4545; 217-244-6565(fax)
E-Mail: gillham@uiuc.edu

Editor: Y. Kwon

Back Issues: Information about availability and prices of back issues starting with Volume 31, Number 1 may be obtained from the publisher's order department (address above). Prior issues, please contact the editorial office.

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0020-7063(200102)36:1;1-G

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Published by Pergamon for the Center for International Education and
Research in Accounting, University of Illinois at Urbana-Champaign

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Pergamon

The International Journal of Accounting
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**The
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Accounting**

International competitive effects of harmonization

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Abstract

The objective of this research is to theoretically examine international competitive consequences surrounding harmonization of international accounting standards. Using a stochastic oligopoly model of two firms in each of two countries, it is shown that when firms only operate domestically, harmonization of accounting standards may not be beneficial for both countries. If it is beneficial for both, then it is also a dominant strategy equilibrium and will be voluntarily implemented by the individual country's standard setting boards. Thus, a meta-FASB can play no value-adding role. Conversely, when firms operate both domestically and internationally, a variety of equilibria may emerge. In general, we observe the result that harmonizing on full disclosure may be detrimental to developing countries, while strictly benefiting developed countries. Also, the benefits to disclosing cost information far exceed the costs of disclosing demand information. Finally, the IASC may in some circumstances add value as a norm setter, not only as a designer/enforcer of more elaborate accounting rules. © 2001 University of Illinois. All rights reserved.

Keywords: Competitive effects; Harmonization of accounting standards; Developing countries

1. Introduction

Just as doctors prescribe medications mindful of the side effects that they might induce, accounting standard setters, in seeking to change disclosure levels to even the playing field between investors in the financial markets, need also to consider the side effects that such changes in disclosure levels might cause. Some standards have generated discussion about the competitive consequences or side effects of alternative disclosure levels, most notably standards relating to segment (or line-of-business, LOB) reporting. However, there seems to be a general feeling that these side effects are so difficult to understand, that they are

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simply best ignored.¹ By way of example, the desirability of a harmonized set of international accounting standards is often seemingly taken for granted. However, what are the competitive side effects for a less developed country (such as Romania, Macedonia, or Trinidad and Tobago) when it harmonizes and adopts IAS as its own?²

The discussion over the side effects of harmonizing to international accounting standards is essentially a discussion over the welfare effects of changing levels and international differences in levels of accounting measurement and disclosure.³ In this paper, we examine the product market or competitive side effects of disclosure choices independent of securities' markets effects and labor market effects.⁴ Prior research in an international setting by Gigler, Hughes, and Rayburn (1994) (hereafter GH&R) examined the combined effect on producers and consumers of a setting in which disclosure was made by one firm to another (but not vice versa). They showed that if two countries are left to themselves, national governments would each domestically mandate less disclosure, but that the national welfare of both countries would be improved were an international accounting standard to require (and enforce) full disclosure.

The current paper addresses a number of questions: for which countries does harmonization on higher levels of disclosure produce beneficial or detrimental side effects for producers? Does the answer depend on the degree of development of the countries under consideration? What role can an international group such as the International Accounting Standards Committee (IASC) play in mitigating detrimental effects? How do these answers change as firms become more global and economies become more independent? These are examined in the context of mandated disclosure being reciprocal in nature and therefore applying to all firms, not just incumbents as in the above-mentioned paper.

The analysis shows that if there is no international trade, whether an individual country benefits or is harmed by mandated disclosure over no disclosure is solely a function of its own degree of development. Thus, harmonized full disclosure will harm those countries which individually had not selected full disclosure. This setting also reveals the tradeoff

¹ The FASB's Statement of Financial Accounting Concepts, No. 2 "Qualitative Characteristics of Accounting Information" contains a section describing "Costs and Benefits". Paragraph 139 states that "From the point of view of society, the loss of competitive advantage that is said to result from some disclosure requirements is clearly in a different category from the other costs involved. Although the loss to one business enterprise may be a gain to another, the Board is aware of and concerned about the economic effects of the possible discouragement of initiative, innovation and willingness to take risks if a reward to risk taking is denied. That is another cost that is impossible to begin to quantify".

² Romania, Macedonia, and Trinidad and Tobago have all recently harmonized to International Accounting Standards.

³ Disclosure typically refers to whether an item is mentioned in the financial statements and accounting measurement refers to standards affecting how an item is recognized in the accounts. While the current model has both measurement and disclosure features, the focus is on analyzing the changing disclosure level, taking the accounting measurement level as a parameter.

⁴ Barth, Clinch, and Shibano (1999) have recently addressed the effects of accounting harmonization in the global equity markets. The effect of disclosure on the labor markets in terms of affecting equilibrium contracting choices between principals and agents is also not considered here. We make the assumption that the firms' decision-makers are personally indifferent between decision alternatives and make profit maximizing choices for their firms.

between the benefits of resolving cost uncertainty, vs. the detriment to firms of resolving demand uncertainty through mutual disclosure. The former are seen to significantly outweigh the latter given similar levels of uncertainty.

The results are more complex when the firms from both countries operate globally. If both countries are relatively developed, then each country will independently select full disclosure as a national standard irrespective of the other country's disclosure choice. Furthermore, full disclosure by both countries is not Pareto dominated by any other information regime. Thus, harmonization is spontaneously achieved, and there is no potential value to the IASC promoting harmonized full disclosure. Conversely, if both countries are developing, then each will independently select no disclosure regardless of the other country's disclosure choice, and again this is not Pareto dominated by any other information regime, and therefore cannot be improved upon by the IASC setting an international standard. In this case, harmonized full disclosure is detrimental in its side effects for both countries.

However, if one country is developed and the other is not, several situations might arise. First, as in GH&R, both countries might be made better off by an enforceable, mandated international accounting standard forcing both countries away from nondisclosure. Second, both countries might be made better off relative to mutual nondisclosure by being directed toward an unenforceable/voluntary international accounting standard for full disclosure. This latter possibility is particularly interesting in light of the real IASC not having the ability to enforce its standards. Third, if one country is already fully disclosing, a second country, which is required to harmonize to full disclosure, would be detrimentally affected if it is not sufficiently developed.

The paper is organized with a literature review followed by a description of the model. Subsequent sections contain the analyses for the Separate Economies and Global Firms Scenarios, each scenario concluding with a summary of results. Finally, there is a comparative statistics analysis across the two scenarios and a section containing conclusions.

2. Literature review

This paper follows research in the economics literature utilizing stochastic oligopoly models to describe product market effects, while investigating the incentives of firms to share information (see Gal-Or, 1985; Novshek & Sonnenschein, 1982; Shapiro, 1986; Vives, 1984). The general nature of the results is that Cournot competitors find it in their interest to exchange marginal cost information (or more generally, firm-specific information), while Bertrand competitors find it in their interest to exchange information about market demand (or more generally, common uncertainty information). Consumers' interests are, in general, diametrically opposed to those of producers.

Such models have also been adopted in the accounting literature to examine the consequences of changes in levels of mandated accounting disclosures. Feltham, Gigler, and Hughes (1992) (hereafter FG&H) in a single country (A) setting with demand uncertainty, consider a monopolist operating in two market segments. First period operations enable the monopolist to become perfectly informed. If the monopolist subsequently discloses its results of operations under Line-of-Business (LOB) reporting, then its disclosure

is completely informative of underlying market demand to the certain entrant, so that competition in the second period takes place under certainty for both firms. However, if the monopolist discloses in aggregate across the two segments, then the entrant in the second period operates at an information disadvantage with respect to the monopolist. FG&H show that while the monopolist prefers aggregate reporting over LOB, domestic welfare is greater under LOB due to the consumers' and entrants' welfare being higher under LOB than under aggregate reporting.

Gigler, Hughes and Rayburn (1994; hereafter GH&R) extend FG&R's domestic model to an international setting. They introduce a symmetric second country (B), such that the entrant in each country is always foreign, i.e., from the other country. Consequently, the domestic welfare for Country A equals the profits of the monopolist in A plus the consumer surplus in A (which are both functions of A's disclosure level) plus the profits of the A-based firm entering B (which is a function of only B's disclosure level). Since the entrant's profits to B are now unaffected by A's disclosure rules, the result observed in FG&H flips so that regardless of the other country's disclosure choice, A's domestic welfare is now greater under aggregate reporting than under LOB. Thus, aggregate reporting by both countries is a dominant strategy equilibrium. However, it is also shown to be Pareto dominated by bilateral LOB reporting, implying that LOB needs to be enforced by an IASC if it is to be implemented. This Pareto dominance by LOB is due to consideration of consumers' welfare, and disappears if only producers' welfare is considered. Thus, in GH&R's model, LOB reporting by A has beneficial side effects for consumers in A, detrimental effects for incumbent producers in A and no effect on A's entrant into B's market.

It is notable that FG&H and GH&R consider a choice between a symmetric (LOB) and an asymmetric (aggregate) information regime. Consequently, one of the key effects of mandated disclosure, the fact that firms not only reveal but also receive information, is absent from their model. Second, although GH&R also consider how their results are sensitive to consideration of firm-specific cost uncertainty as opposed to market demand uncertainty, there is no joint consideration of both types of uncertainty, and therefore of the tradeoff between the two sets of effects. Third, through consideration of a two-period setting, FG&H and GH&R are able to capture the ex post nature of accounting reports being used to refine later production decisions. Others (as in this paper) have chosen the alternative modeling route of a single period in which forward-looking accounting information is available even without prior operations. Results do not appear to be sensitive to this difference in modeling assumption.

3. Model

The international economy consists of two countries, A and B, and four firms. All firms produce the same single good.⁵ Firms 1 and 2 (3 and 4) are listed on the stock exchange in Country A (B), its home country. Each country, *I*, has its own disclosure mandating

⁵ This single good can be thought of as a basket of goods and services.

Table 1
Likelihoods of revenues conditional on demand levels

$p(y_{iI}|a^I)$	$a^I = \mu_{a^I} - \sigma_{a^I}$	$a^I = \mu_{a^I} + \sigma_{a^I}$
$y_{iI} = L$	η	$1 - \eta$
$y_{iI} = H$	$1 - \eta$	η

organization or Financial Accounting Standards Board (FASB-I), promulgating accounting standards applicable to a firm listed on the stock exchange of that country.⁶ Thus, Firms 1 and 2, whose home country is A, adhere to the mandatory disclosure requirements promulgated by FASB-A, even though they may be competing in both Countries A and B. Similarly, Firms 3 and 4, whose home country is B, abide by the requirements of FASB-B.

3.1. Production and competitive environment

Each country, $I \in \{A, B\}$, is characterized by its inverse demand function: $P^I = a^I - \sum_{i \in I} x_i^I$, where x_i^I is firm i 's chosen output in country I , and a^I is a random variable: $a^I \in \{\mu_{a^I} - \sigma_{a^I}, \mu_{a^I} + \sigma_{a^I}\}$ with equal probability, where μ_{a^I} , σ_{a^I} are known, but the realization is not. The total cost function for firm i in country I is $C(x_i^I) = c_{iI}x_i^I$. Unit cost is either high or low; $c_{iI} \in \{\mu_{c^I} - \sigma_{c^I}, \mu_{c^I} + \sigma_{c^I}\}$ with equal probability, where $\mu_{c^I} - \sigma_{c^I}$ are known, but the realization may or may not be. We further assume that c_{iI} and c_{jJ} are distributed independently, for all i, j, I, J . Firms interact in each market as Cournot competitors, selecting output to maximize their expected profits anticipating that their competitors do the same.⁷ All production is local, i.e., occurs in the country in which the product is then sold.

3.2. Private information environment

Firms' accounting systems produce perfect private information about their own marginal cost, c_{iI} . Firms' accounting systems also produce imperfect private signals, y_{iI} , about the overall market demand parameter a^I in the countries where that firm is operating (i.e., potentially in both A and B). The degree of imperfection in producing the market demand signal is described by the parameter $\eta \in [1/2, 1]$. This imperfect signal about total country I demand takes one of two values: $y_{iI} \in \{H, L\}$, with the chance of the high demand signal given a low demand realization also being η . Thus, if $\eta = 1/2$, then the imperfect signal given a high demand realization being η , and symmetrically, the chance of the low demand signal about demand is completely random, and uninformative to competitors if revealed. If $\eta = 1$, then the demand signal perfectly reveals the true value of the market demand parameter and again is uninformative if revealed to competitors, since they too have $\eta = 1$. These likelihoods are summarized in Table 1.

⁶ This is more correctly described in the US as a mechanism incorporating both the SEC and the FASB. For convenience, we use the shorthand FASB to capture the entire regulatory infrastructure composed of an FASB designing accounting measurement and disclosure standards, an accounting profession implementing and proofing them and an SEC enforcing them.

⁷ Assuming that firms costlessly are able to motivate implementation to profit maximizing actions is tantamount to assuming that no agency problems exist between the managers and the owners of the firm.

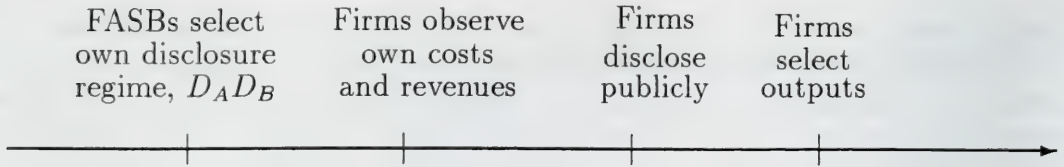


Fig. 1. Time line.

The signals produced by different firms about country I are independent of one another, conditional on the true value of a^I , i.e., the errors are independent. Similarly, the signals produced by firm i are independent across the different countries. We interpret these demand signals as accounting revenues and η as the reliability of individual firm revenues as an indicator of overall market demand.⁸ That η may be less than one, captures the effect of an imperfect accounting measurement process regarding revenues (e.g., due to less than perfect estimates of uncollectible accounts). We assume η is exogenous, and identical for all companies in all countries.

3.3. Public disclosure environment

Within this market setting we consider a variety of mandated accounting disclosure settings. FASB-I independently sets the mandated accounting disclosure level for firms with home country I , with the objective of maximizing the combined expected producer surplus of the firms in its jurisdiction.⁹ This disclosure level for country I , D_I , is either full disclosure (F) or no disclosure (N) and relates to worldwide operations for all firms listed in country I .¹⁰ No

⁸ In this private information environment, the type of information being generated (and later possibly disclosed) is predictive or ex ante in nature. In reality, of course, the financial information which is disclosed via annual reports is historical or ex post in nature: it reports on actual costs and revenues which have been generated. However, one can also readily interpret these historical accounting disclosures as simultaneously being predictive disclosures about the firm's future costs and revenues.

⁹ First, as noted in GH&R, maximization of competitive effects of disclosure is clearly not the stated goal of an FASB. However, if the financial market decision-making effects of a disclosure standard under consideration are positive, then an FASB seeking to set standards based on the joint consideration of financial and product market effects, will modify its choice based on the direction and magnitude of the competitive product market effects. Given the binary nature of the model, selecting full disclosure is logically equivalent to saying that the competitive effects are beneficial for firms (or at least only insignificantly detrimental). Similarly, selecting no disclosure is logically equivalent to the statement that competitive effects are significantly detrimental to firms' welfare. Second, limiting consideration to producer surplus represents a departure from GH&R. Not considering consumer surplus is however consistent with consumers not being mentioned as a category of intended user in Statement of Financial Accounting Concepts, No. 1. Had GH&R considered producer surplus only, they would have predicted aggregate reporting not only as a dominant strategy equilibrium but also as Pareto preferred over LOB.

¹⁰ This too marks a departure from the GH&R setting. All firms in this model potentially disclose private information, whereas in their model, only the incumbent potentially discloses. Second, for ease of computation, only the extremes of full and no disclosure are analyzed as a way to address the more general issues of higher and lower levels of disclosure. As in GH&R, we could interpret the higher level of disclosure as LOB or segment reporting and the lower level of disclosure as aggregate reporting.

disclosure mandated by FASB-I means that each firm under that jurisdiction does not publicly disclose any information. Full disclosure means that the firms must publicly disclose cost and revenue information by country to all other firms. We denote the worldwide public disclosure environment by $D_A D_B$, and is an element of the set: {FF, FN, NF, NN}. The sequencing of events is depicted in Fig. 1.

3.4. *International trade environment*

Under consideration are two international trade environment scenarios:

1. The Separate Economics scenario in which firms operate only in their own home country. Thus, Firms 1 and 2 compete only in Country A and Firms 3 and 4 compete only in Country B. The international economy consists of two economically independent duopolies.
2. The Global Firms scenario in which all four operate in both countries.

For both international trade scenarios, the prediction of producer surplus involves working backwards through the timeline. First, given the FASB disclosure regime choices and a particular realization of firm i 's information set, solutions for firm i 's optimal output choices are generated. Second, squaring individual firm output and weighting by all possible realizations of firm i 's information set generates ex ante expected profits. Aggregating profits over firms and countries generates global producer surplus (GPS) for a given disclosure choice.

3.5. *Research questions*

We use the derived levels of GPS to address a number of questions:

1. Are the competitive side effects of full disclosure harmful or beneficial? How do they change as a function of the exogenous uncertainty parameters?
2. Characterizing developing and developed countries in terms of differing uncertainty parameters, how do the predicted competitive effects vary with the degree of development of the countries?
3. What is the implied role for a meta-FASB, such as the IASC, and how does this differ depending on the degree of development of the constituent countries and the degree of globalization?
4. What is the predicted impact of international harmonization to full disclosure?

4. **Separate economies scenario**

Under the separate economies scenario, only Firms 1 and 2 compete with each other in Country A and only Firms 3 and 4 compete with each other in Country B. Furthermore, disclosures by Firms 1 and 2 have no impact on the welfare of Firms 3 and 4 since the

market demand and costs are independent. Disclosure choices by country I are therefore made without consideration of country J 's choice. Below we consider Country A, Firms 1 and 2, and the disclosure choice by FASB-A. The results are symmetric for Country B, Firms 3 and 4, and the disclosure choice by FASB-B.

4.1. No disclosure in Country A

If FASB-A mandates no disclosure, then Firm 1's relevant information set is $\{c_1, y_1\}$ and Firm 2's is $\{c_2, y_2\}$.¹¹ Using its information, Firm 1 selects output to maximize expected profits, assuming that Firm 2 does the same (Eq. (1)):

$$\max_{x_1(\cdot)} E\Pi_1(x_1(\cdot)) = \max_{x_1(\cdot)} E[a - x_1(\cdot) - x_2(\cdot) - c_1]x_1(\cdot) \quad (1)$$

The corresponding first-order condition is (Eq. (2)):

$$\frac{\partial E\Pi_1}{\partial x_1(\cdot)} \equiv E(a|y_1) - c_1 - 2x_1(\cdot) - E[x_2(\cdot)|y_1, c_1] = 0 \quad (2)$$

which must hold for all four realizations of Firm 1's information set. Conjecture that Firm 1's output choice under no disclosure depends on its information set in the following way (Eq. (3)):

$$x_1^N(\cdot) = \alpha_0 + \alpha_0^H + \alpha_0^+ \quad (3)$$

where α_0^H is included only if $y_1 = y_1^H$ and α_0^+ is included only if $c_1 = \mu_{c^A} + \sigma_{c^A}$. Firm 2 is conjectured to have an identical strategy. Appendix A derives equilibrium values for the coefficients in the output strategy. Appendix B shows that ex ante expected profits for Firm 1 equal the expectation of the squared outputs. Thus (Eq. (4)):

$$E\Pi_1^N = \frac{(\mu_{a^A} - \mu_{c^A})^2}{9} + \frac{\sigma_{c^A}^2}{4} + \sigma_{a^A}^2 K_N \quad (4)$$

where (Eq. (5))

$$K_N = \left[\frac{(2\eta - 1)}{2 + (2\eta - 1)^2} \right]^2 \quad (5)$$

This expression is unaffected by the disclosure choice of FASB-B, as indicated by the single N superscript. The expression for Firm 2's expected profits is identical.

¹¹ If FASB-B simultaneously mandates full disclosure, then strictly speaking, Firm 1's information set also includes the disclosures by Firms 3 and 4. However, these additional disclosures are irrelevant for Firms 1 and 2 in making their output choices in this environment of separate economies. Thus, only the relevant information set is described. Separately, since each firm operates only in its own home country in this scenario of separate economies, the country subscript has been dropped when not misleading.

Since Firms 1 and 2 have zero expected profits in Country B under this scenario, the GPS for Firms 1 and 2 when FASB-A mandates no disclosure is the domestic producer surplus in Country A (Eq. (6)):

$$DPS_A^N = 2E\Pi_1^N \tag{6}$$

Symmetrically, the producer surplus in Country B is (Eq. (7)):

$$DPS_B^N = 2E\Pi_3^N = 2 \left[\frac{(\mu_{a^B} - \mu_{c^B})^2}{9} + \frac{\sigma_{c^B}^2}{4} + \sigma_{a^B}^2 K_N \right] \tag{7}$$

4.2. Full disclosure in Country A

If FASB-A instead mandates full disclosure, then Firms 1 and 2 have the identical relevant information set, namely: $\{c_1, y_1, c_2, y_2\}$. Both firms select output levels to maximize their expected profits assuming the other firm does the same. The first order condition differs slightly from Eq. (2), since now each firm knows the output of the other firm due to their common information set (Eq. (8)):

$$\frac{\partial E\Pi_1}{\partial x_1(\cdot)} \equiv E(a|y_1) - c_1 - 2x_1(\cdot) - x_2(\cdot) = 0 \tag{8}$$

Correspondingly, conjecture Firm 1’s output to be (Eq. (9)):

$$x_1^F(\cdot) = \alpha_0 + \alpha_1^H + \alpha_2^H + \alpha_0^+ + \alpha_1^+ \tag{9}$$

where α_1^H is included only if there is at least one high demand signal, α_2^H is included only if both demand signals are high, where α_0^+ is included only if Firm 1’s own cost signal is high (i.e., $\mu_{c^A} + \sigma_{c^A}$), and α_1^+ is included only if Firm 2’s cost is high. Firm 2’s output is symmetric.

Appendix C states the 16 first-order conditions and derives the equilibrium coefficients in the optimal output strategy for both firms. By the results in Appendix B, taking the expectation of all 16 potential output levels squared gives ex ante expected profits for Firm 1 under full disclosure (Eqs. (10) and (11)):

$$E\Pi_1^F = \frac{(\mu_{a^A} - \mu_{c^A})^2}{9} + \frac{5\sigma_{c^A}^2}{9} + \sigma_{a^A}^2 K_F \tag{10}$$

where

$$K_F = \frac{(2\eta - 1)^2}{9[\eta^2 + (1 - \eta)^2]} \tag{11}$$

When FASB-A mandates full disclosure, domestic producer surplus in Country A is (Eq. (12)):

$$DPS_A^F = 2E\Pi_1^F \tag{12}$$

Symmetrically, the producer surplus in Country B under full disclosure is (Eq. (13)):

$$DPS_B^F = 2E\Pi_3^F = 2 \left[\frac{(\mu_{a^B} - \mu_{c^B})^2}{9} + \frac{5\sigma_{c^B}^2}{9} + \sigma_{a^B}^2 K_F \right] \quad (13)$$

4.3. Choice of disclosure regime in Country A

Stepping back to the first move in the sequence of events, we consider the choice of disclosure regime made by FASB-A. The impact of mandating full disclosure over no disclosure is captured by the difference in domestic producer surplus under the two regimes (Eq. (14)):

$$DPS_A^F - DPS_A^N = \frac{11}{18} \sigma_{c^A}^2 - 2\sigma_{a^A}^2 (K_N - K_F) \quad (14)$$

where $K_N - K_F \geq 0$. Thus, disclosure when there is only cost (demand) uncertainty is beneficial (detrimental) to producer surplus.¹² Further, if both forms of uncertainty are present, and if $\eta = 1/2$ or 1, then $K_N = K_F$ and disclosure is unambiguously desirable, because there is de facto no disclosure of demand “information”.¹³ However, for interior values of η , $K_N - K_F$ is strictly positive, and whether disclosure is beneficial or detrimental (i.e., whether full or no disclosure maximizes producer surplus) depends on the relative values of $K_N - K_F$, $\sigma_{c^A}^2$ and $\sigma_{a^A}^2$.

Proposition 1: Under separate economies, mandating of full disclosure by FASB-I for home country I firms, has beneficial effects on the producer surplus of country I if and only if, $(\sigma_c^1/\sigma_a^1)^2 \geq 36(K_N - K_F)/11$. Otherwise mandated disclosure has detrimental effects.

In the context of real FASBs with a primary objective of better informing investors, this result indicates that consideration of the side effects (or competitive effects) of prescribing disclosure will move the FASB’s disclosure requirements down from the shareholder-decision-making-maximizing level only when the level of demand uncertainty sufficiently dominates the level of cost uncertainty. Furthermore, this critical level is a function of the accuracy of each firm’s revenue signal as an indicator of total market demand, and is highest for intermediate levels of this accuracy parameter. This nonmonotonicity in η is intuitive since for intermediate values of η ¹³ and high levels of demand uncertainty revenues are most

¹² This result is consistent with prior results in the literature in which only a single form of uncertainty is modeled.

¹³ If $\eta = 1/2$, then privately observed individual firm revenues are completely uninformative about market demand, implying that no demand information is disclosed even under full disclosure, and there are no detrimental effects of disclosing demand “information.” Also, if $\eta = 1$, each firm’s privately observed revenue signal is completely informative about market demand, implying that no new demand information is revealed through mutual disclosure of revenue information.

revealing about total market demand, and therefore the sharing of such information is most detrimental. The value from sharing cost information on the other hand is more beneficial the higher is the level of cost uncertainty.

We can relate this result to an institutional setting through consideration of developed vs. developing countries. If developing countries tend to have political settings and economies that are less robust to external shocks, one might expect that overall there is greater variability in market demand (higher σ_d) than in developed countries. Conversely, if developed countries tend to adopt production technologies, which incorporate higher levels of fixed costs (i.e., they have higher levels of operating leverage), one would expect to observe higher fluctuations (higher σ_c) in full production operation costs per unit as production volumes vary than operation would be present for a low-tech production in a developing country. Combining these two factors, we classify developing countries as having relatively low values of the parameter σ_c/σ_d , and developed countries as having higher values. Further, define (Eq. (15)):

$$U_I = \left(\frac{\sigma_{c'}}{\sigma_{d'}} \right)^2 \quad (15)$$

Thus, Proposition 1 predicts that under separate economies, developing countries will tend to experience detrimental side effects from mandating full disclosure, and developed countries beneficial side effects. This result is depicted in Fig. 2. Combining these side effects with the unmodeled primary financial market effects (which are presumed to be positive), implies that developing countries will select lower levels of disclosure than they would if they ignored competitive side effects.

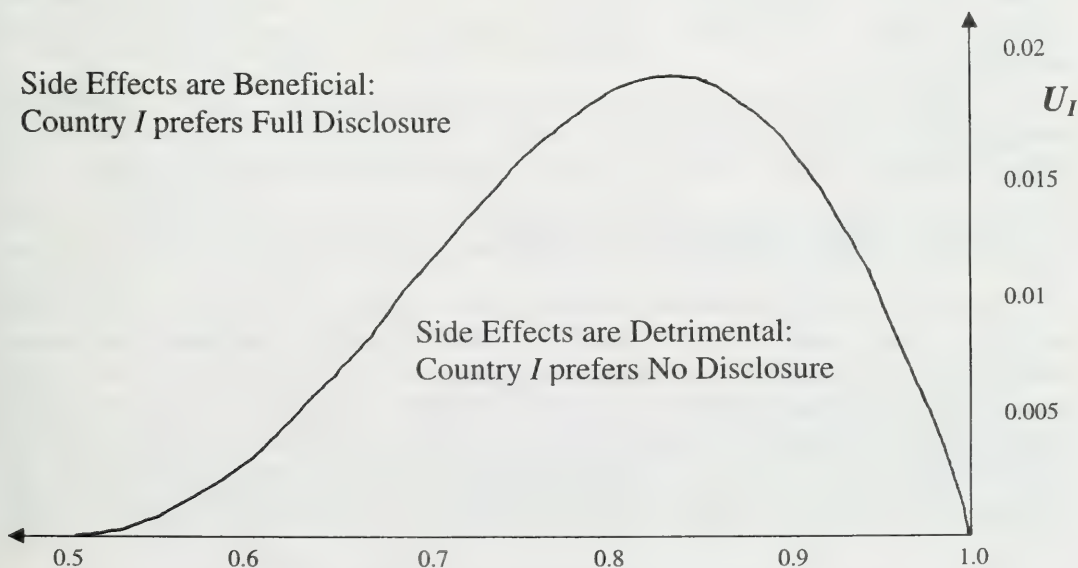


Fig. 2. Equilibrium disclosure regimes under separate economies.

A further interesting observation from Fig. 2 relates to the degree of tradeoff among the side effects, namely between the benefits of disclosing cost information vs. the damage caused by disclosing demand information. Note that the critical U_I level such that there is a switch in preferences varies around 0.01. Since a and c_i are likely to be of the same order of magnitude, if σ_a is on the order of 10 times σ_c , then the benefits from resolving the cost uncertainty approximately equal the cost of resolving the demand uncertainty, or in other words, the country would be indifferent between mandated full disclosure and mandated nondisclosure. Thus, the benefits from disclosing cost information significantly outweigh the detrimental effects of disclosing demand information.

4.4. *Disclosure regime choice under separate economies scenario*

Finally, consider a setting in which both FASB-A and FASB-B make simultaneous mandated disclosure choices. In equilibrium, under separate economies, each FASB's independent choice will constitute a dominant strategy, because of the independence between the disclosure requirements in country J and the welfare consequences in country I . Thus, it follows that:

Proposition 2: The equilibrium international portfolio of disclosure regimes is FF, NN, NF or FN, and results from each country selecting its disclosure level based solely on its uncertainty parameter, U_I and the reliability of revenue information, (η) .

Consequently, if both countries are developed (developing), then an implicitly harmonized portfolio of disclosure regimes of FF (NN) emerges as the equilibrium even without the intermediation of a meta-FASB such as the IASC. However, if A is a developing country and B is a developed country, then the predicted equilibrium portfolio of disclosure regimes is NF, where F should be interpreted as more disclosure and N as less disclosure.¹⁴

In all these cases, international harmonization on full disclosure would be harmful to developing countries, and would need to be enforced. It would have no impact on the welfare of the developed countries, which had already independently selected full disclosure.

4.5. *Summary of results from separate economies*

These results imply that when economies are separate: (a) having nonharmonized standards across countries may Pareto dominate identical (harmonized) accounting standards, (b) each country's own degree of development (and the reliability of revenue information) determines whether its producer welfare is maximized under higher or lower levels of mandated disclosure, (c) harmonization on full disclosure has detrimental side effects for any sufficiently less developed country, which would otherwise not disclose, (d) since each country's producer welfare is unaffected by the disclosure

¹⁴ For example, suppose $\eta=0.75$ in both countries, $U_A=0.01$ and $U_B=0.02$, then $K_N - K_F=0.004$ and $36(K_N - K_F)/11 = 0.01309 > 0$ and the international disclosure equilibrium will be NF.

mandates of the other country, there is no opportunity for a meta-FASB, such as the IASC, to bilaterally enhance producer welfare through harmonization, and (e) the benefits from disclosing cost information significantly outweigh the detrimental effects of disclosing demand information. Finally, (f) forced harmonization never improves producer surplus in this scenario.

5. Global firms scenario

Under the Global Firms scenario, all four firms compete with each other in both countries. Consequently, the strategic output choices for all firms depend not only on the disclosure regime mandated in their own home country, but also on the disclosure regime mandated in the other country as well.

5.1. Both FASBs mandate no disclosure

Under the Global Firms scenario, if both FASB-A and FASB-B mandate no disclosure (i.e., $D_A D_B = NN$), then Firm 1’s information set is $\{c_{1A}, y_{1A}, c_{1B}, y_{1B}\}$, since it is now operating in both countries. The other firms have symmetric information sets. Using this information, Firm 1 makes output choices for each country so as to maximize its own expected profits from operating in each country, assuming that Firms 2, 3, and 4 do the same. Thus, in Country A (Eq. (16)):

$$\max_{x_{1A}(\cdot)} E\Pi_{1A}(x_{1A}(\cdot)) = \max_{x_{1A}(\cdot)} E[a - x_{1A}(\cdot) - x_{2A}(\cdot) - x_{3A}(\cdot) - x_{4A}(\cdot) - c_{1A}]x_{1A}(\cdot) \quad (16)$$

The corresponding first-order condition is (Eq. (17)):

$$\frac{\partial E\Pi_{1A}}{\partial x_{1A}(\cdot)} \equiv E(a|y_{1A}) - c_{1A} - 2x_{1A}(\cdot) - E[x_{2A}(\cdot)|y_{1A}, c_{1A}] - E[x_{3A}(\cdot)|y_{1A}, c_{1A}] - E[x_{4A}(\cdot)|y_{1A}, c_{1A}] = 0 \quad (17)$$

which must hold for all four realizations of Firm 1’s Country A information set. Conjecture that Firm 1’s output choice in Country A depends on its information set in the following way (Eq. (18)):

$$x_{1A}^{NN}(\cdot) = \alpha_0 + \alpha_0^H + \alpha_0^+ \quad (18)$$

where α_0^H is included only if $y_{1A} = y_{1A}^H$ and α_0^+ is included only if $c_{1A} = \mu_{cA} + \sigma_{cA}$. Appendix D presents the first-order conditions and derives the equilibrium coefficients for the output strategy. Squaring the optimal output levels and weighting by the appropriate probabilities give ex ante expected profits for Firm 1 in Country A (Eqs. (19) and (20)):

$$E\Pi_{1A}^{NN} = \frac{(\mu_{aA} - \mu_{cA})^2}{25} + \frac{\sigma_{cA}^2}{4} + \sigma_{aA}^2 K_{NN} \quad (19)$$

where

$$K_{NN} = \left[\frac{(2\eta - 1)}{2 + 3(2\eta - 1)^2} \right]^2 \quad (20)$$

This expression is affected by the disclosure choice of FASB-B of no disclosure, as indicated by the NN superscript. The expression for Firm 1's expected profits in Country B is symmetric (Eq. (21)):

$$E\Pi_{1B}^{NN} = \frac{(\mu_{a^B} - \mu_{c^B})^2}{25} + \frac{\sigma_{c^B}^2}{4} + \sigma_{a^B}^2 K_{NN} \quad (21)$$

Expected profits for Firms 2, 3, and 4 in both countries are identical to those for Firm 1.

Finally, since Firms 1 and 2 are identical, the GPS for Firms 1 and 2 listed in Country A is (Eqs. (22) and (23)):

$$\begin{aligned} \text{GPS}_A^{NN} &= 2[E\Pi_{1A}^{NN} + E\Pi_{1B}^{NN}] \quad (22) \\ &= 2 \left[\frac{(\mu_{a^A} - \mu_{c^A})^2 + (\mu_{a^B} - \mu_{c^B})^2}{25} + \frac{\sigma_{c^A}^2 + \sigma_{c^B}^2}{4} + (\sigma_{a^A}^2 + \sigma_{a^B}^2) K_{NN} \right] \end{aligned}$$

Under this disclosure regime, the GPS for Firms 3 and 4 listed in Country B is also (Eq. (24)):

$$\text{GPS}_B^{NN} = 2[E\Pi_{3A}^{NN} + E\Pi_{3B}^{NN}] = \text{GPS}_A^{NN} \quad (24)$$

5.2. Both FASBs mandate full disclosure

If both FASB-A and FASB-B mandate full disclosure, then $D_A D_B = FF$, and all four firms have the identical information set: $\{c_{iA}\}, \{y_{iA}\}, \{c_{iB}\}, \{y_{iB}\} \forall i \in \{1, 2, 3, 4\}$, since all firms are now operating in both countries. As in the mutual no disclosure case in Section 5.1, all firms select output levels to maximize their expected profits assuming the other firms do the same. The first-order condition, however, differs slightly from Eq. (17), since now each firm knows the output that the others will produce due to their common information set (Eq. (25)):

$$\frac{\partial E\Pi_{1A}}{\partial x_{1A}(\cdot)} \equiv E(a|y_{1A}) - c_{1A} - 2x_{1A}(\cdot) - x_{2A} - x_{3A} - x_{4A} = 0 \quad (25)$$

Consequently, conjecture that Firm 1's output choice in Country A depends on its information set in the following way (Eq. (26)):

$$x_{1A}^{FF}(\cdot) = \alpha_0 + \alpha_1^H + \alpha_2^H + \alpha_3^H + \alpha_4^H + \alpha_0^+ + \alpha_1^+ + \alpha_2^+ + \alpha_3^+ \quad (26)$$

where α_j^H is included only if there are at least j high demand signals (including its own), α_0^+ is included only if Firm 1's own coast signal is high (i.e., $\mu_{c^A} + \sigma_{c^A}$), and α_k^+ is included only

if at least k other firms' cost signals are high. Treating the other firms symmetrically, we solve for the Bayesian Nash equilibrium output levels conditional on the information set available to Firm 1. Appendix E presents the relevant first-order conditions and the resulting equilibrium coefficients for the output strategy. The resulting ex ante expected profits for Firm 1 in Country A are (Eqs. (27) and (28)):

$$E\Pi_{1A}^{FF} = \frac{(\mu_{a^A} - \mu_{c^A})^2}{25} + \frac{19\sigma_{c^A}^2}{25} + \sigma_{a^A}^2 K_{FF} \tag{27}$$

where

$$K_{FF} = \left[\frac{(2\eta - 1)}{5} \right]^2 \left[\frac{[\eta^2 + (1 - \eta)^2]^2}{[\eta^4 + (1 - \eta)^4]} + \frac{[4\eta(1 - \eta)]}{[\eta^2 + (1 - \eta)^2]} \right] \tag{28}$$

This expression is affected by the disclosure choice of FASB-B of full disclosure, as indicated by the FF superscript. Symmetrically, Firm 1's expected profits in Country B are (Eq. (29)):

$$E\Pi_{1B}^{FF} = \frac{(\mu_{a^B} - \mu_{c^B})^2}{25} + \frac{19\sigma_{c^B}^2}{25} + \sigma_{a^B}^2 K_{FF} \tag{29}$$

Expected profits for Firms 2, 3, and 4 in Country A (B) are identical to those for Firm 1 in A (B) under this information setting of bilateral full disclosure.

Finally, the GPS for Firms 1 and 2 listed in Country A is (Eqs. (30) and (31)):

$$GPS_A^{FF} = 2[E\Pi_{1A}^{FF} + E\Pi_{2B}^{FF}] \tag{30}$$

$$= 2 \left[\frac{(\mu_{a^A} - \mu_{c^A})^2 + (\mu_{a^B} - \mu_{c^B})^2}{25} + \frac{19(\sigma_{c^A}^2 + \sigma_{c^B}^2)}{25} + (\sigma_{a^A}^2 + \sigma_{a^B}^2) K_{FF} \right] \tag{31}$$

Under this full disclosure regime, the GPS for Firms 3 and 4 listed in Country B is also (Eq. (32)):

$$GPS_B^{FF} = 2[E\Pi_{3A}^{FF} + E\Pi_{4B}^{FF}] = GPS_A^{FF} \tag{32}$$

5.3. Different disclosure mandates across countries

Under the global firms scenario, if FASB-A mandates no disclosure and FASB-B mandates full disclosure, (i.e., $D_A D_B = NF$), Firm 1's information set is: $\{c_{iA}, y_{iA}, c_{iB}, y_{iB}\} \forall i \in \{1, 3, 4\}$, and Firm 2's information set is: $\{c_{iA}, y_{iA}, c_{iB}, y_{iB}\} \forall i \in \{2, 3, 4\}$, while Firm 3's (and Firm 4's) information set is: $\{c_{iA}, y_{iA}, c_{iB}, y_{iB}\} \forall i \in \{3, 4\}$.

Conjecture that Firm 1's output choice in Country A depends on its information set in the following way (Eq. (33)):

$$x_1^A(\cdot) = \alpha_0 + \alpha_0^H + \alpha_1^L + \alpha_1^H + \alpha_2^L + \alpha_2^H + \alpha_0^+ + \alpha_1^- + \alpha_1^+ + \alpha_2^- + \alpha_2^+ \tag{33}$$

where α_j^L is included if at least j other firms have high demand signals regarding Country A, where α_j^H is included only if there are at least j other high demand signals and Firm 1's demand signal is high. Furthermore, α_k^- is included if at least k other firms' cost signals are high (i.e., $\mu_{c^A} + \sigma_{c^A}$), and α_k^+ is included only if at least k other firms' cost signals are high and Firm 1's own cost signal is high. Firm 2 is treated symmetrically. Firms 3 and 4 are, however, conjectured to have a different optimal output choice in Country A based on the information they observe (Eq. (34)):

$$x_3^A(I_3) = \beta_0 + \beta_1 + \beta_2 + \beta_0^+ + \beta_1^+ + \beta_2^+ \quad (34)$$

where β_1 is included if y_3 or y_4 is H, and β_2 is included only if both are H. Also, β_0^+ is included if Firm 3's own cost signal is high (i.e., $\mu_{c^A} + \sigma_{c^A}$), β_1^+ is included if the other firm's cost signal is high, and β_2^+ is included only if both firms' cost signals are high. We solve for the Bayesian Nash equilibrium output levels conditional on the information set available to each firm. The necessary first-order conditions and the resulting output strategy coefficients are given in Appendix F.

Finally, the GPS for Country A's Firms 1 and 2 when no disclosure is mandated by Country A, and full disclosure is mandated by FASB-B is (Eqs. (35)–(37)):

$$\text{GPS}_A^{\text{NF}} = 2[E\Pi_{1A}^{\text{NF}} + E\Pi_{1B}^{\text{NF}}] \quad (35)$$

$$= 2 \left[\frac{(\mu_{a^A} - \mu_{c^A})^2 + (\mu_{a^B} - \mu_{c^B})^2}{25} + \frac{33(\sigma_{c^A}^2 + \sigma_{c^B}^2)}{100} + (\sigma_{a^A}^2 + \sigma_{a^B}^2)K_{\text{NFA}} \right] \quad (36)$$

where

$$K_{\text{NFA}} = \frac{(2\eta - 1)^2}{25[\eta^2 + (1 - \eta)^2]} + \frac{2\eta(1 - \eta)(2\eta - 1)^2}{[2 + (2\eta - 1)^2]^2} + \frac{4\eta^3(1 - \eta)^3(2\eta - 1)^2[\eta^3 + (1 - \eta)^3]}{[\eta^2 + (1 - \eta)^2][2(\eta^3 + (1 - \eta)^3) + \eta(1 - \eta)(2\eta - 1)^2]} \quad (37)$$

By contrast, the GPS for Firms 3 and 4 listed in Country B is (Eqs. (38) and (39)):

$$\text{GPS}_B^{\text{NF}} = 2[E\Pi_{3A}^{\text{NF}} + E\Pi_{3B}^{\text{NF}}] = 2 \left[\frac{(\mu_{a^A} - \mu_{c^A})^2 + (\mu_{a^B} - \mu_{c^B})^2}{25} + \frac{17(\sigma_{c^A}^2 + \sigma_{c^B}^2)}{25} + (\sigma_{a^A}^2 + \sigma_{a^B}^2)K_{\text{NFB}} \right] \quad (38)$$

where

$$K_{\text{NFB}} = \frac{(2\eta - 1)^2}{25[\eta^2 + (1 - \eta)^2]} \quad (39)$$

Thus, it is readily seen that $K_{\text{NFA}} \geq K_{\text{NFB}}$ for all $\eta \in [1/2, 1]$.

Alternatively, if FASB-A mandates full disclosure and FASB-B no disclosure, (i.e., $D_A D_B = \text{FN}$), the GPS of the two countries is reversed from the NF disclosure scenario (Eq. (40)):

$$\text{GPS}_A^{\text{FN}} = \text{GPS}_B^{\text{NF}}, \quad \text{GPS}_B^{\text{FN}} = \text{GPS}_A^{\text{NF}} \quad (40)$$

Table 2
GPS for A and B under global firms scenario

$GPS_A^{D^A D_B}, GPS_B^{D^A D_B}$	$D_B = \text{Full}$	$D_B = \text{No}$
$D_A = \text{Full}$	$(38/25U + 2K_{FF}, 38/25U + 2K_{FF})$ $\equiv (\$FF, \$FF)$	$(34/25U + 2K_{NFB}, 33/50U + 2K_{NFA})$ $\equiv (\$NFB, \$NFA)$
$D_A = \text{No}$	$(33/50U + 2K_{NFA}, 34/25U + 2K_{NFB})$ $\equiv (\$NFA, \$NFB)$	$(1/2U + 2K_{NN}, 1/2U + 2K_{NN})$ $\equiv (\$NN, \$NN)$

5.4. Disclosure regime choice under global firms scenario

Since $GPS_I^{NF} \neq GPS_I^{NN}$ and $GPS_I^{FN} \neq GPS_I^{FF}$, the welfare of each country is affected by the disclosure regimes in both countries. Thus, the disclosure choice by each FASB-I in the absence of an IASC harmonizing disclosure choices, should be modeled as a noncooperative game in which each FASB simultaneously selects between two disclosure levels (no disclosure and full disclosure), knowing that its counterpart FASB in the other country is doing the same and with the objective of maximizing the producer welfare of the firms listed in its jurisdiction.¹⁵

Rescaling the payoffs to remove the common term of $[2(\mu_{a^A} - \mu_{c^A})^2 + 2(\mu_{a^B} - \mu_{c^B})^2]/25$ and defining $U = ((\sigma_{c^A})^2 + (\sigma_{c^B})^2) / ((\sigma_{a^A})^2 + (\sigma_{a^B})^2)$, gives the payoffs in Table 2. Note also the simplification in notation:¹⁶

$$GPS_A^{FF} = \$FF$$

$$GPS_A^{NF} = \$NFA$$

$$GPS_A^{FN} = \$NFB$$

$$GPS_A^{NN} = \$NN$$

where, for example, $\$FF \equiv 38/25U + 2K_{FF}$ is the global payoff to country I 's listed firms under bilaterally mandated full disclosure. Depending on the ranking of the four different payoff levels ($\$FF, \$NFA, \$NFB, \NN), different equilibria of international disclosure choices may emerge. As in the previous scenario, these payoffs represent only the competitive side effects from disclosure on producer profits. Our interest is in gaining a sense of when these effects are most severely detrimental and therefore, most likely to conflict with objectives of increasing disclosure to the financial markets.

¹⁵ Again as indicated in footnote 9, this is really shorthand for saying that the FASB optimally trades off the financial market effects of disclosure with its competitive side effects.

¹⁶ For clarification, FF denotes the international disclosure setting of bilateral full disclosure, while $\$FF$ denotes the *payoffs* to a given country under bilateral full disclosure.

Table 3
Region I ordinaly ranked GPS

Payoffs	$D_B = \text{Full}$	$D_B = \text{No}$
$D_A = \text{Full}$	(4,4)	(3,2)
$D_A = \text{No}$	(2,3)	(1,1)

Note that U can be restated as a weighted average of the two countries' degrees of development (i.e., U_A and U_B), where the weights reflect each country's relative share in global market demand uncertainty.

$$\begin{aligned}
 U &= \frac{(\sigma_{c^A})^2 + (\sigma_{c^B})^2}{(\sigma_{a^A})^2 + (\sigma_{a^B})^2} = \left[\frac{\sigma_{c^A}^2}{\sigma_{a^A}^2} \right] \frac{\sigma_{a^A}^2}{(\sigma_{a^A}^2 + \sigma_{a^B}^2)} + \left[\frac{\sigma_{c^B}^2}{\sigma_{a^B}^2} \right] \frac{\sigma_{a^B}^2}{(\sigma_{a^A}^2 + \sigma_{a^B}^2)} \\
 &= U_A \left(\frac{\sigma_{a^A}^2}{\sigma_{a^A}^2 + \sigma_{a^B}^2} \right) + U_B \left(\frac{\sigma_{a^B}^2}{\sigma_{a^A}^2 + \sigma_{a^B}^2} \right)
 \end{aligned}$$

Thus, if both countries are developing then U is low; if one is developing and one is developed then U takes an intermediate value, and if both are developed then U is high.

Proposition 3: Firms in country I are always made better off if country J mandates full disclosure for firms listed in country J.

Proof: True since $\$FF \geq \NFB and $\$NFA \geq \NN . □

This proposition indicates that even though there are $4 \times 3 \times 2 \times 1 = 24$ potential orderings of the four payoff levels, only 6 ($= 24/2/2$) of these are actually feasible, and correspond to 6 regions in $U-\eta$ space. For each region, a different equilibrium portfolio of international disclosure regimes emerges, in the absence of harmonization.

5.4.1. Region I: $\{(\eta, U): \$FF > \$NFB > \$NFA > \$NN\}$

For this region, the four payoff levels are ordinaly numbered in Table 3 with $\$FF$ having the highest value (and therefore denoted by "4"), $\$NFB$ having the second highest value (and therefore denoted by "3"), $\$NFA$ denoted by "2," and $\$NN$ by "1."

Given these payoffs, $D_A D_B = FF$ is a dominant strategy equilibrium. Regardless of the other country's choice of disclosure regime, each country's listed firms are best off in total when that country selects mandated full disclosure. Each FASB will independently be motivated to select full disclosure. Harmonized accounting standards emerge spontaneously without intervention from a meta-FASB, because competitive side effects for both countries are beneficial.

Table 4
Region II ordinaly ranked GPS

Payoffs	$D_B = \text{Full}$	$D_B = \text{No}$
$D_A = \text{Full}$	(4,4)	(2,3)
$D_A = \text{No}$	(3,2)	(1,1)

Table 5
Region IIIA ordinally ranked GPS

Payoffs	$D_B = \text{Full}$	$D_B = \text{No}$
$D_A = \text{Full}$	(4,4)	(1,3)
$D_A = \text{No}$	(3,1)	(2,2)

5.4.2. Region II: $\{(\eta, U): \$FF > \$NFA > \$NFB > \$NN\}$

The GPS payoffs in Region II are given in Table 4.

$D_A D_B = FF$ is again a dominant strategy equilibrium. Each FASB will independently be motivated to select full disclosure. Again, there is no role for a meta-FASB: harmonization occurs spontaneously.

5.4.3. Region IIIA: $\{(\eta, U): \$FF > \$NFA > \$NN > \$NFB\}$

The GPS payoffs in Region IIIA are given in Table 5.

$D_A D_B \equiv \{NN, FF\}$ are both Nash equilibria, but there are beneficial side effects to both countries if they harmonize on full disclosure, i.e., bilateral full disclosure Pareto dominates bilateral nondisclosure. However, there is no guarantee that the full disclosure Nash equilibrium will be reached if each country selects its disclosure regime independently. However, such coordination might be achieved through a meta-FASB, such as the IASC, focusing FASBs on harmonized full disclosure. The role of the IASC, however, would not include disclosure enforcement, since in this region, full disclosure is self-enforcing once it is reached.

5.4.4. Region IIIB: $\{(\eta, U): \$NFA > \$FF > \$NFB > \$NN\}$

The GPS payoffs in Region IIIB are given in Table 6.

$D_A D_B \equiv \{NF, FN\}$ are both Nash equilibria. Considering either of these Nash equilibria, any move on the part of IASC towards harmonizing on full disclosure will reduce the welfare of the country newly required to disclose, but have a beneficial side effect on the country already disclosing. Since bilateral full disclosure is not a Nash equilibrium in this parameter region, its implementation would need to be enforced by the IASC.

5.4.5. Region IV: $\{(\eta, U): \$NFA > \$FF > \$NN > \$NFB\}$

The GPS payoffs in Region IV are given in Table 7.

$D_A D_B = NN$ is a dominant strategy equilibrium, but both countries would experience beneficial side effects under harmonized full disclosure. However again, since such harmonization would not be a Nash equilibrium, it would again require enforcing to be

Table 6
Region IIIB ordinally ranked GPS

Payoffs	$D_B = \text{Full}$	$D_B = \text{No}$
$D_A = \text{Full}$	(3,3)	(2,4)
$D_A = \text{No}$	(4,2)	(1,1)

Table 7
Region IV ordinarily ranked GPS

Payoffs	$D_B = \text{Full}$	$D_B = \text{No}$
$D_A = \text{Full}$	(3,3)	(1,4)
$D_A = \text{No}$	(4,1)	(2,2)

Table 8
Region V ordinarily ranked GPS

Payoffs	$D_B = \text{Full}$	$D_B = \text{No}$
$D_A = \text{Full}$	(2,2)	(1,4)
$D_A = \text{No}$	(4,1)	(3,3)

implemented. Thus, an IASC could only add value to both member countries if it could enforce harmonization on full disclosure.

5.4.6. Region V: $\{(\eta, U): \$NFA > \$NN > \$FF > \$NFB\}$

The GPS payoffs in Region V are given in Table 8.

$D_A D_B = NN$ is a dominant strategy equilibrium. Furthermore, there is no part of Region V for which harmonization (enforced or not) on full disclosure could improve both countries' welfare. In this region, harmonizing on full disclosure has detrimental side effects for both

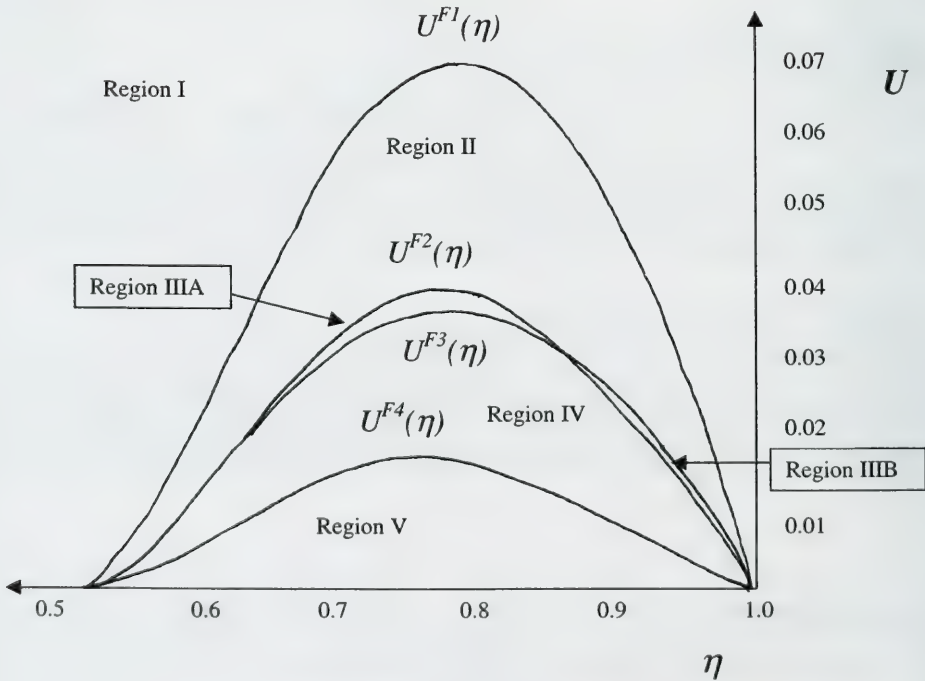


Fig. 3. Equilibrium disclosure regimes under global firms.

countries, and therefore, there is no potential value-adding role for an IASC seeking harmonization on full disclosure.

These six regions depicted in Fig. 3 are bounded by four $U(\eta)$ functions:

1. $U^{F1}(\eta) \equiv \{(\eta, U): \$NFA = \$NFB\} \equiv 100/35[K_{NFA} - K_{NFB}]$
2. $U^{F2}(\eta) \equiv \{(\eta, U): \$NN = \$NFB\} \equiv 100/43[K_{NN} - K_{NFB}]$
3. $U^{F3}(\eta) \equiv \{(\eta, U): \$NFA = \$FF\} \equiv 100/43[K_{NFA} - K_{FF}]$
4. $U^{F4}(\eta) \equiv \{(\eta, U): \$NN = \$FF\} \equiv 100/51[K_{NN} - K_{FF}]$

where, for example, U^{F1} is defined such that $\$NFA = \NFB , or equivalently:

$$\frac{33}{50}U + 2K_{NFA} = \frac{34}{25}U + 2K_{NFB}$$

Comparing the results across these regions, gives the following results in the absence of a meta-FASB imposing harmonization:¹⁷

Proposition 4: (a) At the extreme values of $\eta = 1/2, 1$ bilateral full disclosure is the Pareto optimal dominant strategy equilibrium, for all U . (b) For $\eta \in (1/2, 1)$, if U is sufficiently high, (Regions I and II), then bilateral full disclosure is a dominant strategy equilibrium and Pareto dominates bilateral nondisclosure. (c) For $\eta \in (1/2, 1)$, if U is sufficiently low, (Region V), then bilateral non-disclosure is a dominant strategy equilibrium and Pareto dominates bilateral full disclosure. (d) For $\eta \in (1/2, 1)$, (Regions III and IV), if U takes an intermediate value, then bilateral full disclosure is never a dominant strategy equilibrium, although it may be a Nash equilibrium (Region IIIA).

These results describing the equilibrium emergence of various disclosure regime combinations in the absence of a meta-FASB translate into results regarding the desirability of instituting an IASC demanding harmonized full disclosure, as indicated below.

5.5. Summary of results under global firms scenario

First, if both countries are sufficiently developed, then both FASBs would select full disclosure and harmonized full disclosure emerges spontaneously without the intervention of an IASC. Second, if both countries are sufficiently less developed, then each FASB will independently select nondisclosure. In this setting, harmonized full disclosure is detrimental to both countries' firms. Finally, if the average degree of development across both countries is at an intermediate level, then harmonized full disclosure will have one of two effects. (a) If

¹⁷ It is questionable whether the different regions that have been identified actually correspond to plausible combinations of parameter values. Simple examples suggest that they do. Suppose that $\eta = 0.75$, and $\mu_a = 2\mu_c$ for both countries implying a margin of 50%. Further, if the coefficient of variation in cost per unit (i.e., σ_c/μ_c) is 10%, then a coefficient of variation in market demand (i.e., σ_a/μ_a) of 30%, implies $U_I = (\sigma_c/\sigma_a)^2 = U$ is 1/36, which would lie in Region IV. Alternatively, a coefficient of variation in market demand (i.e., σ_a/μ_a) of 10%, for both countries, implies $U_I = (\sigma_c/\sigma_a)^2 = U$ is 0.25, which would lie in Region I.

both FASBs had noncooperatively selected nondisclosure, then IASC harmonized full disclosure will benefit both countries' firms. However, this may need external enforcement to guarantee implementation. (b) If one FASB selected full disclosure and the other nondisclosure, then IASC harmonized full disclosure detrimentally affects the nondiscloser of the two countries, while strictly benefiting the already disclosing country. Harmonization in this case would require enforcement to guarantee implementation. If there has been evolution from separate economics to global firms, then this latter situation is most likely to arise with the developing country's FASB selecting non-disclosure and the developed country's FASB selecting full disclosure. Thus, again, harmonized full disclosure may harm the firms in developing countries.

These results, however, also imply that when firms operate globally, there is a value-adding role for a meta-FASB harmonizing full disclosure, but only if there is an intermediate level of average development across countries. In some instances, as in GH&R, a meta-FASB can only improve both constituent countries' welfare, if the meta-FASB has the power to mandate and enforce an international accounting standard. In our results, we see that a meta-FASB may also add value simply by coordinating countries' disclosure regimes without the need for enforcement.

6. Comparative statics: the effect of globalization

Comparing the results from both international trade scenarios, one can predict how the side effects of harmonizing on full disclosure (relative to no harmonization) are likely to change as international trade increases and firms becomes more global. Comparing Figs. 2 and 3, it is notable that the critical U values lie in the 0.01–0.07 range for both. A number of interesting observations also emerge.

The move toward global firms is likely accompanied by a situation of one developed country (A) and one developing country (B). Prior to globalization, under separate economies, the developed country would have mandated full disclosure and the developing country not: thus they would be in the regime FN. From this setting, as the firms globalize, a simultaneous move toward harmonized full disclosure will always have beneficial side effects for the developed country (since $\$FF > \NFA for all regions). However, harmonized full disclosure has detrimental side effects for the developing country (B) if the average U level is not sufficiently high (i.e., falls in Regions IIIB, IV, or V). This is of relevance and possibly concern for understanding the side effects on countries such as Macedonia and Albania, which have recently harmonized their standards to International Accounting Standards. It is also worth noting however, that unlike in the separate economies case, for a given level of development of Country B, the more developed is Country A the more likely that the average level of uncertainty, U , lies in Regions I, II, or IIIA and therefore, the less likely that B actually experiences detrimental competitive side effects from harmonized full disclosure.¹⁸

Second, in the scenario where countries are more homogeneous in their degrees of development (either both developed or both developing) prior to globalization, then

¹⁸ This arises due to the reciprocal nature of international trade in this setting.

harmonization on full disclosure will have identical effects on both countries (both beneficial or both detrimental) as in the separate economies case.

7. Conclusion

In this paper, we have examined the international competitive effects of harmonization on full disclosure levels. In contrast to results in GH&R applauding the IASB's move toward harmonization on LOB reporting, it has been shown here that the effects in particular on producer welfare require more extensive consideration. Countries are not unambiguously better off if they join a move toward full disclosure. The analysis here has weighed the tradeoffs in simultaneously disclosing cost and market demand information by all firms in a country — including foreign competitors — to all other firms, and shows that the equilibrium international disclosure outcome is a function of the degree of development. In particular, developing countries harmonizing on full disclosure are at greatest risk of experiencing detrimental side effects, especially if the other country although developed is not significantly so.

The model used here also shows promise for analyzing further interesting scenarios related to setting of international accounting standards. For example, the model could be extended to incorporate a scenario in which firms of one country operate in both countries, but the firms in the second country only operate at home. This might in a different way capture the distinction between developing and developed nations. A second extension would be to allow the disclosure alternatives to capture the idea that harmonization is only feasible at a less than maximal level of disclosure, i.e., the notion that one harmonizes to an average level of disclosure rather than harmonizing to the maximal level of disclosure.

Acknowledgments

Helpful comments have been received from Stefano Zambon, Joelle Le Vourc'h, Ting-Ting Lin, Cagnur Kaytmaz, Yan Feng, and participants at the 1999 AAA International Accounting Section conference.

Appendix A. Output strategy: separate economies: N

Since Firms 1 and 2 operate only in Country A, the subscript A is dropped in the following derivation. If $y_1 = H$ and $c_1 = \mu_c - \sigma_c$, then from Eq. (2), $x_1^{N(\cdot)} = \alpha_0 + \alpha_0^H$. Substituting into the first-order condition in Eq. (3) gives (Eqs. (41)–(44)):

$$\begin{aligned} E(a|y_1^H) - (\mu_c - \sigma_c) - 2(\alpha_0 + \alpha_0^H) - [\alpha_0 + \alpha_0^H p(y_2^H|y_1^H) + \alpha_0^+ p(c_2 = \mu_c + \sigma_c)] \\ = 0 \end{aligned} \quad (41)$$

where

$$E(a|y_1^H) = \eta(\mu_a + \sigma_a) + (1 - \eta)(\mu_a - \sigma_a) = \mu_a + \sigma_a(2\eta - 1) \quad (42)$$

$$p(y_2^H|y_1^H) = \eta^2 + (1 - \eta)^2 \quad (43)$$

$$p(c_2 = \mu_c + \sigma_c) = 1/2 \quad (44)$$

Thus, the first-order condition for Firm 1 for this information realization is (Eq. (45)):

$$\begin{aligned} & \mu_a + \sigma_a(2\eta - 1) - (\mu_c - \sigma_c) - 2(\alpha_0 + \alpha_0^H) \\ & - [\alpha_0 + \alpha_0^H(\eta^2 + (1 - \eta)^2) + \alpha_0^+/2] \\ & = 0 \end{aligned} \quad (45)$$

Similarly, if $y_1 = y_1^H$ and $c_1 = \mu_c + \sigma_c$, the first-order condition is (Eq. (46)):

$$\begin{aligned} & \mu_a + \sigma_a(2\eta - 1) - (\mu_c + \sigma_c) - 2(\alpha_0 + \alpha_0^H + \alpha_0^+) \\ & - [\alpha_0 + \alpha_0^H(\eta^2 + (1 - \eta)^2) + \alpha_0^+/2] \\ & = 0 \end{aligned} \quad (46)$$

Furthermore, if $y_1 = y_1^L$ and $c_1 = \mu_c - \sigma_c$, the first-order condition is (Eq. (47)):

$$\mu_a - \sigma_a(2\eta - 1) - (\mu_c - \sigma_c) - 2(\alpha_0) - [\alpha_0 + \alpha_0^H 2\eta(1 - \eta) + \alpha_0^+/2] = 0 \quad (47)$$

Furthermore, if $y_1 = y_1^L$ and $c_1 = \mu_c + \sigma_c$, the first-order condition is (Eq. (48)):

$$\mu_a - \sigma_a(2\eta - 1) - (\mu_c + \sigma_c) - 2(\alpha_0 + \alpha_0^+) - [\alpha_0 + \alpha_0^H 2\eta(1 - \eta) + \alpha_0^+/2] = 0 \quad (48)$$

Solving these four equations simultaneously for α_0 , α_0^H , and α_0^+ yields (Eqs. (49)–(51)):

$$\alpha_0 = \frac{\mu_a - \mu_c}{3} + \frac{\sigma_c}{2} - \frac{(2\eta - 1)\sigma_a}{2 + (2\eta - 1)^2} \quad (49)$$

$$\alpha_0^H = \frac{(2\eta - 1)2\sigma_a}{2 + (2\eta - 1)^2} \quad (50)$$

$$\alpha_0^+ = -\sigma_c \quad (51)$$

In the case of no disclosure, each of the four possible information realizations occurs with equal probability. These probabilities are used in weighting the squared output levels to compute the ex ante expected profits, as explained in Appendix B.

Appendix B Ex post expected profits

By definition, ex post expected profits for Firm 1 are:

$$\pi_1(\cdot) = E \left[\left(a - \sum_{i=1}^n x_i \right) x_1 - c_1 x_1 \right]$$

and since the optimal output strategy is implicitly defined as:

$$x_1(\cdot) \in \arg \max_{x_1} \pi_1(\cdot)$$

we have:

$$\frac{\partial \pi_1(\cdot)}{\partial x_1} \equiv E \left[a - \sum_{i=1}^2 x_i - x_1 - c_1 \right] = 0.$$

Thus:

$$x_1(\cdot) = E \left[a - \sum_{i=1}^2 x_i - c_1 \right]$$

It follows that:

$$\pi_1(\cdot) = [x_1(\cdot)]^2$$

Consequently, ex ante expected profits are:

$$E(\pi_1(\cdot)) = E([x_1(\cdot)]^2)$$

Appendix C. Output strategy: separate economies: F

Since Firms 1 and 2 operate only in Country A, the subscript A is dropped in the following derivation. Designating the information set as follows: $\{y_1, y_2, c_1, c_2\}$, the 16 potential realizations can be reduced to the following five realizations and their corresponding first-order conditions. The 11 other realizations are each equivalent to one of the five relevant realizations in terms of their impact on the first-order condition.

$$\{L, L, -, -\} \quad \mu_a - k_1 \sigma_a - 2[\alpha_0] - [\alpha_0] - (\mu_c - \sigma_c) = 0$$

$$\{H, L, -, -\} \quad \mu_a - 2[\alpha_0 + \alpha_1^H] - [\alpha_0 + \alpha_1^H] - (\mu_c - \sigma_c) = 0$$

$$\{H, H, -, -\} \quad \mu_a + k_1 \sigma_a - 2[\alpha_0 + \alpha_1^H + \alpha_2^H] - [\alpha_0 + \alpha_1^H + \alpha_2^H] - (\mu_c - \sigma_c) = 0$$

$$\{L, L, +, -\} \quad \mu_a - k_1 \sigma_a - 2[\alpha_0 + \alpha_0^+] - [\alpha_0 + \alpha_1^+] - (\mu_c + \sigma_c) = 0$$

$$\{L, L, -, +\} \quad \mu_a - k_1 \sigma_a - 2[\alpha_0 + \alpha_1^+] - [\alpha_0 + \alpha_0^+] - (\mu_c - \sigma_c) = 0$$

where:

$$k_1 = \frac{(2\eta - 1)}{\eta^2 + (1 - \eta)^2}$$

Solving these five equations simultaneously for α_0 , α_1^H , α_2^H , α_0^+ and α_1^+ yields (Eqs. (52)–(55)):

$$\alpha_0 = \frac{\mu_{a^A} - \mu_{c^A}}{3} + \frac{\sigma_{c^A}}{3} - \frac{(2\eta - 1)\sigma_{a^A}}{3[\eta^2 + (1 - \eta)^2]} \tag{52}$$

$$\alpha_1^H = \alpha_2^H = \frac{(2\eta - 1)\sigma_{a^A}}{3[\eta^2 + (1 - \eta)^2]} \tag{53}$$

$$\alpha_0^+ = \frac{-4\sigma_{c^A}}{3} \quad (54)$$

$$\alpha_1^+ = \frac{2\sigma_{c^A}}{3} \quad (55)$$

The probabilities of the different information realizations (and consequently different output levels) are as follows:

$$\left. \begin{array}{l} p(L, L, *, *) \\ p(H, H, *, *) \end{array} \right\} = \frac{1}{8} (\eta^2 + (1 - \eta)^2)$$

where *, * represents any combination of cost disclosures. By contrast:

$$\left. \begin{array}{l} p(H, L, *, *) \\ p(L, H, *, *) \end{array} \right\} = \frac{1}{8} 2\eta(1 - \eta)$$

These probabilities are used in weighting the squared output levels to compute the ex ante expected profits.

Appendix D. Output strategy: global firms: NN

Since firms operate symmetrically in both countries, the country subscript is dropped in the following derivation. Designating the information set as follows: $\{y_1, c_1\}$, the four potential realizations and their corresponding first-order conditions are:

$$\{L, -\} \quad \mu_a - \sigma_a(2\eta - 1) - 2[\alpha_0] - 3[\alpha_0 + 2\eta(1 - \eta)\alpha_0^H + \alpha_0^+/2] - (\mu_c - \sigma_c) = 0$$

$$\{H, -\} \quad \mu_a + \sigma_a(2\eta - 1) - 2[\alpha_0 + \alpha_0^H] - 3[\alpha_0 + (\eta^2 + (1 - \eta)^2)\alpha_0^H + \alpha_0^+/2] - (\mu_c - \sigma_c) = 0$$

$$\{L, +\} \quad \mu_a - \sigma_a(2\eta - 1) - 2[\alpha_0 + \alpha_0^+] - 3[\alpha_0 + 2\eta(1 - \eta)\alpha_0^H + \alpha_0^+/2] - (\mu_c + \sigma_c) = 0$$

$$\{H, +\} \quad \mu_a + \sigma_a(2\eta - 1) - 2[\alpha_0 + \alpha_0^H + \alpha_0^+] - 3[\alpha_0 + (\eta^2 + (1 - \eta)^2)\alpha_0^H + \alpha_0^+/2] - (\mu_c + \sigma_c) = 0$$

Solving these four equations simultaneously for α_0 , α_0^H , and α_0^+ yields (Eqs. (56)–(58)):

$$\alpha_0 = \frac{\mu_{a^A} - \mu_{c^A}}{5} + \frac{\sigma_{c^A}}{2} - \frac{(2\eta - 1)\sigma_{a^A}}{2 + 3(2\eta - 1)^2} \quad (56)$$

$$\alpha_0^H = \frac{2(2\eta - 1)\sigma_{a^A}}{2 + 3(2\eta - 1)^2} \quad (57)$$

$$\alpha_0^+ = -\sigma_{c^A} \tag{58}$$

The probabilities of the four different information realizations are all 1/4.

Appendix E. Output strategy: global firms: FF

Since firms operate symmetrically in both countries, the country subscript is dropped in the following derivation. Designating the information set as follows: $\{y_1, y_2, y_3, y_4, c_1, c_2, c_3, c_4\}$, the 256 potential realizations can be reduced to the following nine realizations and their corresponding first-order conditions. The other realizations are each equivalent to one of the nine relevant realizations in terms of their impact on the first-order conditions.

$$\begin{aligned} \{L, L, L, L, -, -, -, -\} & \mu_a - k_2\sigma_a - 5[\alpha_0] - (\mu_c - \sigma_c) = 0 \\ \{H, L, L, L, -, -, -, -\} & \mu_a - k_1\sigma_a - 5[\alpha_0 + \alpha_1^H] - (\mu_c - \sigma_c) = 0 \\ \{H, H, L, L, -, -, -, -\} & \mu_a - 5[\alpha_0 + \alpha_1^H + \alpha_2^H] - (\mu_c - \sigma_c) = 0 \\ \{H, H, H, L, -, -, -, -\} & \mu_a + k_1\sigma_a - 5[\alpha_0 + \alpha_1^H + \alpha_2^H + \alpha_3^H] - (\mu_c - \sigma_c) = 0 \\ \{H, H, H, H, -, -, -, -\} & \mu_a + k_2\sigma_a - 5[\alpha_0 + \alpha_1^H + \alpha_2^H + \alpha_3^H + \alpha_4^H] - (\mu_c - \sigma_c) = 0 \\ \{L, L, L, L, +, -, -, -\} & \mu_a - k_2\sigma_a - 2[\alpha_0 + \alpha_0^+] - 3[\alpha_0 + \alpha_1^+] - (\mu_c + \sigma_c) = 0 \\ \{L, L, L, L, -, +, -, -\} & \mu_a - k_2\sigma_a - 2[\alpha_0 + \alpha_1^+] - [3\alpha_0 + \alpha_0^+ + 2\alpha_1^+] - (\mu_c - \sigma_c) \\ & = 0 \\ \{L, L, L, L, +, +, -, -\} & \mu_a - k_2\sigma_a - 2[\alpha_0 + \alpha_0^+ + \alpha_1^+] - [3\alpha_0 + \alpha_0^+ + 3\alpha_1^+ + 2\alpha_2^+] \\ & - (\mu_c + \sigma_c) = 0 \\ \{L, L, L, L, +, +, +, -\} & \mu_a - k_2\sigma_a - 2[\alpha_0 + \alpha_0^+ + \alpha_1^+ + \alpha_2^+] \\ & - [3\alpha_0 + 2\alpha_0^+ + 3\alpha_1^+ + 3\alpha_2^+ + \alpha_3^+] - (\mu_c + \sigma_c) = 0 \end{aligned}$$

where (Eqs. (59) and (60))

$$k_1 = \frac{2\eta - 1}{\eta^2 + (1 - \eta)^2} \tag{59}$$

$$k_2 = \frac{(2\eta - 1)(\eta^2 + (1 - \eta)^2)}{(\eta^4 + (1 - \eta)^4)} \tag{60}$$

Solving these equations simultaneously for $\alpha_0, \alpha_1^H, \alpha_2^H, \alpha_3^H, \alpha_4^H, \alpha_0^+, \alpha_1^+, \alpha_2^+$ and α_3^+ yields (Eqs. (61)–(65)):

$$\alpha_0 = \frac{\mu_{a^A} - \mu_{c^A}}{5} + \frac{\sigma_{c^A}}{5} - \frac{k_2\sigma_{a^A}}{5} \tag{61}$$

$$\alpha_1^H = \alpha_4^H = \frac{(k_2 - k_1)\sigma_{a^4}}{5} \quad (62)$$

$$\alpha_2^H = \alpha_3^H = \frac{k_1\sigma_{a^4}}{5} \quad (63)$$

$$\alpha_0^+ = \frac{-8\sigma_{c^4}}{5} \quad (64)$$

$$\alpha_1^+ = \alpha_2^+ = \alpha_3^+ = \frac{2\sigma_{c^4}}{5} \quad (65)$$

The probabilities of the different information realizations (and consequently different output levels) are as follows (Eq. (66)):

$$\left. \begin{array}{l} p(L, L, L, L, *, *, *, *) \\ p(H, H, H, H, *, *, *, *) \\ p(H, L, L, L, *, *, *, *) \\ p(L, H, L, L, *, *, *, *) \\ p(L, L, H, L, *, *, *, *) \\ p(L, L, L, H, *, *, *, *) \\ p(L, H, H, H, *, *, *, *) \\ p(H, L, H, H, *, *, *, *) \\ p(H, H, L, H, *, *, *, *) \\ p(H, H, H, L, *, *, *, *) \\ p(H, H, L, L, *, *, *, *) \\ p(H, L, H, L, *, *, *, *) \\ p(H, L, L, H, *, *, *, *) \\ p(L, H, H, L, *, *, *, *) \\ p(L, H, L, H, *, *, *, *) \\ p(L, L, H, H, *, *, *, *) \end{array} \right\} = \frac{1}{32} (\eta^4 + (1 - \eta)^4) \quad (66)$$

$$\left. \begin{array}{l} p(L, L, L, L, *, *, *, *) \\ p(L, L, L, H, *, *, *, *) \\ p(L, H, H, H, *, *, *, *) \\ p(H, L, H, H, *, *, *, *) \\ p(H, H, L, H, *, *, *, *) \\ p(H, H, H, L, *, *, *, *) \\ p(H, H, L, L, *, *, *, *) \\ p(H, L, H, L, *, *, *, *) \\ p(H, L, L, H, *, *, *, *) \\ p(L, H, H, L, *, *, *, *) \\ p(L, H, L, H, *, *, *, *) \\ p(L, L, H, H, *, *, *, *) \end{array} \right\} = \frac{1}{32} (\eta^3(1 - \eta) + (1 - \eta)^3\eta)$$

$$\left. \begin{array}{l} p(H, L, L, H, *, *, *, *) \\ p(L, H, H, L, *, *, *, *) \\ p(L, H, L, H, *, *, *, *) \\ p(L, L, H, H, *, *, *, *) \end{array} \right\} = \frac{2}{32} \eta^2(1 - \eta)^2$$

where *, *, *, * represents any combination of cost disclosures. These probabilities are used in weighting the squared output levels to compute the ex ante expected profits.

Appendix F. Output strategy: global firms: NF

The first-order conditions under this information scenario differ for the disclosing and nondisclosing firms, given their asymmetric information sets and output strategies. However, since firms operate symmetrically in both countries, the country subscript is dropped in the following derivation. Designating the information set for the nondisclosing Firm 1 as follows: $\{y_1, y_3, y_4, c_1, c_3, c_4\}$, the 64 potential realizations can be reduced to the following 11 realizations and their corresponding first-order conditions. The other realizations are each equivalent to one of the 11 relevant realizations in terms of their impact on the first-order conditions.

$$\{L, L, L, -, -, -\} \quad \mu_a - k_3\sigma_a - 2[\alpha_0] - 2\beta_0 - (\mu_c - \sigma_c) - [\alpha_0 + k_4\alpha_0^H + \alpha_0^+/2] = 0$$

$$\{H, L, L, -, -, -\} \quad \mu_a - (2\eta - 1)\sigma_a - 2[\alpha_0 + \alpha_0^H] - 2\beta_0 - (\mu_c - \sigma_c) \\ - [\alpha_0 + k_5\alpha_0^H + \alpha_0^+/2] = 0$$

$$\{L, H, L, -, -, -\} \quad \mu_a - (2\eta - 1)\sigma_a - 2[\alpha_0 + \alpha_1^L] - 2(\beta_0 + \beta_1) - (\mu_c - \sigma_c) \\ - [\alpha_0 + \alpha_1^L + k_5(\alpha_0^H + \alpha_1^H) + \alpha_0^+/2] = 0$$

$$\{H, H, L, -, -, -\} \quad \mu_a + (2\eta - 1)\sigma_a - 2[\alpha_0 + \alpha_1^L + \alpha_0^H + \alpha_1^H] - 2(\beta_0 + \beta_1) \\ - (\mu_c - \sigma_c) - [\alpha_0 + \alpha_1^L + (1 - k_5)(\alpha_0^H + \alpha_1^H) + \alpha_0^+/2] = 0$$

$$\{L, H, H, -, -, -\} \quad \mu_a + (2\eta - 1)\sigma_a - 2[\alpha_0 + \alpha_1^L + \alpha_2^L] - 2(\beta_0 + \beta_1 + \beta_2) \\ - (\mu_c - \sigma_c) - [\alpha_0 + \alpha_1^L + \alpha_2^L + (1 - k_5)(\alpha_0^H + \alpha_1^H + \alpha_2^H) + \alpha_0^+/2] = 0$$

$$\{H, H, H, -, -, -\} \quad \mu_a + k_3\sigma_a - 2[\alpha_0 + \alpha_1^L + \alpha_2^L + \alpha_0^H + \alpha_1^H + \alpha_2^H] \\ - 2(\beta_0 + \beta_1 + \beta_2) - (\mu_c - \sigma_c) \\ - [\alpha_0 + \alpha_1^L + \alpha_2^L + (1 - k_4)(\alpha_0^H + \alpha_1^H + \alpha_2^H) + \alpha_0^+/2] = 0$$

$$\{L, L, L, +, -, -\} \quad \mu_a - k_3\sigma_a - 2[\alpha_0 + \alpha_0^+] - 2\beta_0 - (\mu_c + \sigma_c) \\ - [\alpha_0 + k_4\alpha_0^H + \alpha_0^+/2] = 0$$

$$\{L, L, L, -, +, -\} \quad \mu_a - k_3\sigma_a - 2[\alpha_0 + \alpha_1^-] - (2\beta_0 + \beta_0^c + \beta_1^c) - (\mu_c - \sigma_c) \\ - [\alpha_0 + k_4\alpha_0^H + \alpha_1^- + (\alpha_0^+ + \alpha_1^+)/2] = 0$$

$$\{L, L, L, +, +, -\} \quad \mu_a - k_3\sigma_a - 2[\alpha_0 + \alpha_1^- + \alpha_0^+ + \alpha_1^+] - (2\beta_0 + \beta_0^c + \beta_1^c) \\ - (\mu_c + \sigma_c) - [\alpha_0 + k_4\alpha_0^H + \alpha_1^- + (\alpha_0^+ + \alpha_1^+)/2] = 0$$

$$\{L, L, L, -, +, +\} \quad \mu_a - k_3\sigma_a - 2[\alpha_0 + \alpha_1^- + \alpha_2^-] - 2(\beta_0 + \beta_0^c + \beta_1^c + \beta_2^c) \\ - (\mu_c - \sigma_c) - [\alpha_0 + k_4\alpha_0^H + \alpha_1^- + \alpha_2^- + (\alpha_0^+ + \alpha_1^+ + \alpha_2^+)/2] = 0$$

$$\{L, L, L, +, +, +\} \quad \mu_a - k_3\sigma_a - 2[\alpha_0 + \alpha_1^- + \alpha_2^- + \alpha_0^+ + \alpha_1^+ + \alpha_2^+] \\ - 2(\beta_0 + \beta_0^c + \beta_1^c + \beta_2^c) - (\mu_c + \sigma_c) \\ - [\alpha_0 + k_4\alpha_0^H + \alpha_1^- + \alpha_2^- + (\alpha_0^+ + \alpha_1^+ + \alpha_2^+)/2] = 0$$

where (Eqs. (67)–(72))

$$k_1 = \frac{(2\eta - 1)}{\eta^2 + (1 - \eta)^2} \quad (67)$$

$$k_2 = \frac{(2\eta - 1)(\eta^2 + (1 - \eta)^2)}{\eta^4 + (1 - \eta)^4} \quad (68)$$

$$k_3 = \frac{(2\eta - 1)(1 - \eta + \eta^2)}{\eta^3 + (1 - \eta)^3} \quad (69)$$

$$k_4 = \frac{\eta(1 - \eta)(\eta^2 + (1 - \eta)^2)}{\eta^3 + (1 - \eta)^3} \quad (70)$$

$$k_5 = 2\eta(1 - \eta) \quad (71)$$

$$k_6 = \frac{\eta(1 - \eta)}{\eta^2 + (1 - \eta)^2} \quad (72)$$

Designating the information set for the disclosing Firm 3 as follows: $\{y_3, y_4, c_3, c_4\}$, the 16 potential realizations can be reduced to the following six realizations and their corresponding first-order conditions. The other realizations are each equivalent to one of the six relevant realizations in terms of their impact on the first-order conditions.

$$\{L, L, -, -\} \quad \mu_a - k_1\sigma_a - 2\beta_0 + \beta_0 - (\mu_c - \sigma_c) - 2[\alpha_0 + k_6\alpha_0^H + \alpha_0^+/2] = 0$$

$$\{H, L, -, -\} \quad \mu_a - 2[\beta_0 + \beta_1] - [\beta_0 + \beta_1] - (\mu_c - \sigma_c) \\ - 2[\alpha_0 + \alpha_1^L + (\alpha_0^H + \alpha_1^H)/2 + \alpha_0^+/2] = 0$$

$$\{H, H, -, -\} \quad \mu_a + k_1\sigma_a - 2[\beta_0 + \beta_1 + \beta_2] - [\beta_0 + \beta_1 + \beta_2] - (\mu_c - \sigma_c) \\ - 2[\alpha_0 + \alpha_1^L + \alpha_2^L + (1 - k_6)(\alpha_0^H + \alpha_1^H + \alpha_2^H) + \alpha_0^+/2] = 0$$

$$\{L, L, +, -\} \quad \mu_a - k_1\sigma_a - 2[\beta_0 + \beta_1^c] - [\beta_0 + \beta_0^c] - (\mu_c + \sigma_c) \\ - 2[\alpha_0 + k_6\alpha_0^H + \alpha_1^- + (\alpha_0^+ + \alpha_1^+)/2] = 0$$

$$\{L, L, -, +\} \quad \mu_a - k_1\sigma_a - 2[\beta_0 + \beta_1^c] - [\beta_0 + \beta_0^c] - (\mu_c - \sigma_c) \\ - 2[\alpha_0 + k_6\alpha_0^H + \alpha_1^- + (\alpha_0^+ + \alpha_1^+)/2] = 0$$

$$\{L, L, +, +\} \quad \mu_a - k_1\sigma_a - 2[\beta_0 + \beta_0^c + \beta_1^c + \beta_2^c] - [\beta_0 + \beta_0^c + \beta_1^c + \beta_2^c] - (\mu_c + \sigma_c) \\ - 2[\alpha_0 + k_6\alpha_0^H + \alpha_1^- + \alpha_2^- + (\alpha_0^+ + \alpha_1^+ + \alpha_2^+)/2] = 0$$

Simultaneously solving these first-order conditions generates the following values for the output coefficients for operations in country *I*. For convenience, the superscript *I* has been dropped from μ_a , μ_c , σ_a , and σ_c :

$$\alpha_0 = \frac{(\mu_a - \mu_c)}{5} + \frac{\sigma_c}{10} - \frac{\sigma_a(2\eta - 1)[1 + (\eta^2 + (1 - \eta)^2)(\eta^3 + (1 - \eta)^3)]}{5(\eta^2 + (1 - \eta)^2)[2(\eta^3 + (1 - \eta)^3) + \eta(1 - \eta)(2\eta - 1)^2]}$$

$$\alpha_0^H = \frac{\sigma_a 2\eta(1-\eta)(2\eta-1)}{[2(\eta^3 + (1-\eta)^3) + \eta(1-\eta)(2\eta-1)^2]}$$

$$\alpha_1^L = \frac{\sigma_a 2(2\eta-1)[-2 + 11\eta - 7\eta^2 - 40\eta^3 + 100\eta^4 - 96\eta^5 + 32\eta^6]}{5(\eta^2 + (1-\eta)^2)[2 + (2\eta-1)^2][2(\eta^3 + (1-\eta)^3) + \eta(1-\eta)(2\eta-1)^2]}$$

$$\alpha_1^H = \frac{\sigma_a 4(2\eta-1)^3}{[2 + (2\eta-1)^2][2(\eta^3 + (1-\eta)^3) + \eta(1-\eta)(2\eta-1)^2]}$$

$$\alpha_2^L = \frac{-\sigma_a 2(2\eta-1)[-8 + 49\eta - 133\eta^2 + 200\eta^3 - 180\eta^4 + 96\eta^5 - 32\eta^6]}{5(\eta^2 + (1-\eta)^2)[2 + (2\eta-1)^2][2(\eta^3 + (1-\eta)^3) + \eta(1-\eta)(2\eta-1)^2]}$$

$$\alpha_2^H = -\frac{\sigma_a 4(2\eta-1)^3}{[2 + (2\eta-1)^2][2(\eta^3 + (1-\eta)^3) + \eta(1-\eta)(2\eta-1)^2]}$$

$$\alpha_0^+ = -\sigma_c$$

$$\alpha_1^- = \alpha_2^- = \frac{2\sigma_c}{5}$$

$$\alpha_1^+ = \alpha_2^+ = 0$$

and

$$\beta_0 = \frac{(\mu_a - \mu_c)}{5} + \frac{3\sigma_c}{5} - \frac{\sigma_a(2\eta-1)}{5(\eta^2 + (1-\eta)^2)}$$

$$\beta_1 = \beta_2 = \frac{\sigma_a(2\eta-1)}{5(\eta^2 + (1-\eta)^2)}$$

$$\beta_0^+ = -\frac{8\sigma_c}{5}$$

$$\beta_1^+ = \frac{2\sigma_c}{5}$$

$$\beta_2^+ = 0$$

The probabilities of the different information realizations (and consequently different output levels) from firm 1's (a nondisclosing firm's) perspective are as follows:

$$\left. \begin{array}{l} p(L, L, L, *, *, *) \\ p(H, H, H, *, *, *) \end{array} \right\} = \frac{1}{16} (\eta^3 + (1-\eta)^3)$$

$$\left. \begin{array}{l} p(H, L, L, *, *, *) \\ p(L, H, L, *, *, *) \\ p(L, L, H, *, *, *) \\ p(L, H, H, *, *, *) \\ p(H, L, H, *, *, *) \\ p(H, H, L, *, *, *) \end{array} \right\} = \frac{1}{16} [\eta^2(1 - \eta) + (1 - \eta)^2\eta]$$

where *, *, * represents any combination of cost disclosures. These probabilities are used in weighting the squared output levels to compute the ex ante expected profits for Firm 1 (and 2).

The probabilities of the different information realizations (and consequently different output levels) from Firm 3's (a disclosing firm's) perspective are as follows:

$$\left. \begin{array}{l} p(L, L, *, *) \\ p(H, H, *, *) \end{array} \right\} = \frac{1}{8} (\eta^2 + (1 - \eta)^2)$$

$$\left. \begin{array}{l} p(H, L, *, *) \\ p(L, H, *, *) \end{array} \right\} = \frac{2}{8} \eta(1 - \eta)$$

where *,* represents any combination of cost disclosures. These probabilities are used in weighting the squared output levels to compute the ex ante expected profits for Firm 3 (and 4).

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Pergamon

The International Journal of Accounting
36 (2001) 33–45

**The
International
Journal of
Accounting**

Agency effects and escalation of commitment Do small national culture differences matter?

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Abstract

In order to test for hypothesized effects of national culture on management control systems with a cost-effective sample size, most cross-cultural studies rely on large differences in culture in their experimental design. However, much of the world's cross-border investment takes place between nations that are culturally close, for example, the USA, Canada and the UK. Case evidence indicates that even apparently small cultural differences, such as that between the USA and Canada, can be particularly troublesome since it is widely assumed that small differences do not matter, when, in fact, they do. This study explores the effect of an apparently small difference in national culture on the ability of agency theory to explain escalation of commitment to failing projects in two countries with significant cross-border investment, i.e., USA and Canada. We found that the effect of adverse selection conditions was significantly stronger among managers from the more individualist USA. We also found that more experienced managers were less likely to escalate commitment. We discuss the implications of this finding for the design of control systems in US–Canada cross-border subsidiaries. © 2001 University of Illinois. All rights reserved.

Keywords: Agency; National culture; Escalation of commitment

1. Introduction

Most cross-cultural studies of management control rely on large differences in culture in their experimental design. However, much of the world's cross-border investment takes place

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between nations that are culturally close, for example, the USA, Canada and the UK. In 1995, US foreign direct investment (FDI) in Canada was approximately US\$130 billion (approximately 65% of total FDI in Canada), making Canada the second largest recipient of US investment. In the same year, some US\$100 billion of Canadian FDI (over 50% of Canadian foreign investment) was located in the US. As Evans, Lane, O'Grady, and Hildebrand (1992) found, even small differences in culture, such as that between the USA and Canada, can be particularly troublesome for managerial decision-making, since it is widely assumed that small differences do not matter. Their study found a very high failure rate among US–Canada cross-border retailing ventures.

Accordingly, we report the results of a test of the effect of a small, but significant, difference in culture on the effect of management controls on an important managerial decision, namely, the escalation of commitment to a losing course of action. Previous cross-cultural escalation studies have compared North America (usually, the USA) with countries at opposite extremes of most national culture measures countries (e.g., Hong Kong, Singapore and Taiwan). While these countries are attractive for experimental design purposes, they play a relatively small part in the global pattern of FDI. Thus, it is desirable to calibrate these findings against countries that are culturally less dissimilar, and whose cross-border investments are economically significant.

2. Literature review

2.1. *The escalation phenomenon*

Brockner (1992), in a synthesis of previous literature, points out that “escalating commitment appears to be the result of numerous factors and processes.” One theoretical framework that has received considerable recent attention is agency theory. Agency theory builds on classical expected utility economics models by relaxing the assumption that the manager's and the firm's interests are identical. While in classical expected utility theory, managers always make decisions that attempt to maximize the profits of the firm, agency theory, in contrast, assumes that managerial and owner interests can diverge. Therefore, managers, despite being agents of shareholders, will, under certain conditions, make decisions that maximize their personal utility, not that of the firm's shareholders (Jensen & Meckling, 1976). The conditions that are necessary for this divergence (known as adverse selection) in an escalation context are:

1. Information asymmetry, where the agent (manager) has more information than the principal (firm owner), so that the principal is not fully aware of the state of the project, and
2. Incentive to shirk, i.e., the manager's reward for continuing (escalating) the project is greater than that for discontinuing it.

Applying agency theory to the escalation decision, Kanodia, Bushman, and Dickhaut (1989) proposed an equilibrium model in which rational managers would escalate a project if

its abandonment would adversely affect their (valuable) reputations as competent managers, and the managers possess private information regarding the state of the project. Abandoning the failing project reveals this state, while escalating it protects their reputation. Harrell and Harrison (1994) and Harrison and Harrell (1993) tested this model in experiments involving MBA students in an American university, and found support for the agency explanation, in that the interaction of information asymmetry and incentive to shirk was positively associated with willingness to continue a losing project.

2.2. *The role of national culture*

Many studies have demonstrated the strong explanatory power of national culture differences in patterns of decision-making and control systems (e.g., Boyacigiller & Adler, 1991; Harrison, 1993; Harrison, McKinnon, Panchapakesan, & Leung, 1994; Merchant, Chow, & Wu, 1995). In the area of escalation of commitment, the theoretical effects of culture are unclear. Drawing on the work of Hofstede (1980, 1991), Chow, Harrison, Lindquist, and Wu (1997, p. 351) suggest that, “as a result of a collective culture’s need for group affiliation, its members are very concerned with maintaining ‘face’ . . .,” and predicted that relative to their US counterparts, Chinese nationals would be more likely to invest additional resources (escalate) in an unprofitable project. Sharp and Salter (1997) suggest that individualism *interacts* with the effect of agency. They argued that since adverse selection is driven by self-interest, agency effects should be weaker in collectivist societies in which overt self-interest is disdained.

Chow et al. (1997), using a single decision case and American and Taiwanese subjects, found that managers in Taiwan were indeed more likely to escalate (a main effect). However, Sharp and Salter (1997), using Asian (Hong Kong and Singapore) and North American (US and Canada) managers, found conflicting evidence. Using three decision cases, they found a significant culture main effect (where culture was operationalized as Asian or North American), but its direction depended on the decision being made. They also confirmed the universality of a framing effect, and found evidence that culture affects agency in that the agency effect was insignificant in all three cases for their Asian sample yet highly significant in North America.

Both Chow et al. (1997) and Sharp and Salter (1997) compared subjects from countries at cultural extremes. Thus, they demonstrate that culture differences affect escalation decisions, but it is not possible to discern from their findings whether the smaller differences that exist between the major international investing countries are large enough to matter. In the case of Hofstede’s culture dimensions, for example, Hofstede and Schreuder (1987, p. 30) state that “in view of the large number of respondents, differences of two or three points on the scales are already statistically significant.” However, it is not known whether this *statistical* significance translates to *practical* significance for managerial decision-making. Abramson, Keating, and Lane (1996) note that failure to understand cultural subtlety may lead to false generalizations about regional blocs, and Abramson et al. (1996) and Evans et al. (1992) found significant differences in the work values and attitudes of Canadian and US managers, two groups often treated as culturally similar (Sharp & Salter, 1997).

2.3. Other variables

A number of escalation studies have invoked prospect theory (Bazerman, 1984; Kahneman & Tversky, 1979; Whyte, 1986), which centers its analysis on the presentation of information and its cognitive processing. The consequence of this framing is that risky choices result in risk-seeking behavior for outcomes framed as losses, and risk-averse behavior for gain outcomes. Whyte (1993), using Canadian undergraduate students, showed that the presence of a sunk cost increased the likelihood of escalation, and Rutledge and Harrell (1993), using professional MBA students, and Rutledge (1995), using MBA students, also showed that the negative framing of decision outcomes increased escalation, consistent with prospect theory.

The effect of work experience on escalation of commitment is unclear. Some audit judgement studies have reported that the work experience of the decision-maker affects decision-making. Smith and Kida's (1991) review of the audit judgement literature concluded that experience mitigates judgement bias in job-specific decisions, and Davis (1996) presented evidence that work experience is positively related to the ability of subjects to focus on relevant information. In contrast, Kennedy (1995) found (also in an audit judgement decision) no evidence that experience reduces cognitive bias. In the escalation literature, Arkes and Blumer (1985), Harrell and Harrison (1994) and Whyte (1993) used inexperienced students, while others (Harrison & Harrell, 1993; Sharp & Salter, 1997), recognizing possible problems with this approach, have used experienced managers. The latter studies, to the extent that they tested for experience effects, reported conflicting results. Harrison and Harrell (1993) found no effect, but Sharp and Salter (1997) found that more experienced managers were less willing to escalate. We therefore control for the possible effects of experience in the regression.

3. Hypothesis

Sharp and Salter (1997) found that the self-interest motivation behind adverse selection does not operate in collectivist countries. We extend this finding to hypothesize a directional interaction between individualism and agency.

Hypothesis 1: A small but statistically significant increase in individualism increases the effect of adverse selection conditions (information asymmetry and incentive to shirk).

4. Method

4.1. Sample

In order to achieve external validity and managerial relevance, we chose subjects who are familiar with the subject material, who had wide diversity of managerial experience

(undergraduate students were excluded), and we used realistic decisions. The questionnaire was therefore administered to managers participating in MBA, executive MBA and executive development programs in business schools. Subjects were chosen from countries in which managers in one country are likely to make decisions on behalf of investors in the others, i.e., the countries had significant cross-border investment and movement of managers. Finally, we considered the guidelines suggested by Harrison and McKinnon (1999) for cross-cultural studies, i.e., that countries should be different on the culture measure of interest, but also matched on other confounding culture dimensions that might affect results. Since our purpose was to test the effect of a relatively subtle individualism difference while holding other dimensions constant, we chose the US and Canada. These countries show a modest but statistically significant difference on the culture dimension of interest, i.e., individualism, (the US has a score of 91, Canada 80) while being similar in almost all other respects.¹ They also have the highest level of cross-border investment in the world.

4.2. Instrument

Each subject was presented with four different one-page escalation decision cases (following Sharp & Salter 1997). Subjects were asked to indicate their preference for making a further investment on a 10-point scale. Following Harrison and Harrell (1993), the scale was anchored at one end by definitely preferred [*not to* make the investment (score = 1)] and the other end by definitely preferred [*to* make the investment (score = 10)]. As a manipulation check and to enhance the realism of the case situation, subjects were also asked to express their choice as a go/no-go decision.

In all cases, the activities (projects) to date had incurred nonrecoverable losses, and their future outcome was in some doubt. In all cases, the additional investment was break-even (the expected value of its outcomes exactly equaled the incremental amount to be invested), and, if successful, the net proceeds would exactly recover the previously invested (sunk) cost.² Two cases were operating decisions (market research and software development projects), which potentially included long-run intangible benefits, and two were short-term financial decisions with no possible long-term consequences for the firm (currency speculation and a risky bank loan).³ As part of a larger program of research, this study also included tests of the main effects of agency, framing and work experience. These are

¹ For uncertainty avoidance, the USA and Canada scores are 46 and 48, and for power distance, 40 and 39, respectively. The USA is 10 points higher than Canada on the masculinity dimension. However, we are aware of no evidence of the effect of masculinity on escalation. To the extent that masculinity captures a drive to achievement orientation, the effect of masculinity would strengthen the predicted effects of individualism.

² The outcomes described in the instrument were described as occurring shortly after the decision, thereby keeping the stage of escalation constant (Brockner, 1992), and avoiding complications associated with the time value of money.

³ The theory of capital budgeting suggests that the expected value of escalating the two operating investments is positive, if the real options, or side bets (Staw & Ross, 1987), embedded in them are also valued. In contrast, the two financial decisions have no such options.

included in the regression for completeness and to avoid omitted variables problems, but are not the focus of this paper.

Agency was manipulated by including, in two of the four cases, a description of the decision-making situation in which both conditions for adverse selection (information asymmetry and a personal incentive to take the risk) were present, and in the other two, a description in which they were absent. Framing (the prospect theory effect) was manipulated by describing the outcome of not taking the decision in either neutral or negative. Four versions of each case were created (for each agency and framing manipulation). (Appendix A provides an illustrative example of the manipulation of the bank loan case.) Each participant received the four different cases, each with a different combination of the agency and framing manipulation. The cases were reviewed for external validity and pretested in classes in both countries. To control for possible order or fatigue effects, two orders of cases were used (the second being the reverse of the first). However, in spite of pretesting, initial analysis identified a significant order-of-cases effect in the software development case. Consequently, findings from this case were not included.⁴ The monetary amounts in the decision were realistic amounts for which respondents would likely be responsible in the course of their own work.

Subjects were also asked to report a variety of demographic data. Subjects whose manipulation check responses did not match their scalar response⁵ or who were not country natives were eliminated from the sample.

4.3. Measurement of variables

The dependent variable was the score on the 1–10 willingness to escalate scale. The agency manipulation was a binary variable, coded 1 for the presence of information symmetry and incentive to shirk, and 0 otherwise. Similarly, negative framing of the outcomes of escalating was coded 1, and the neutral framing was coded 0. Work experience was measured as the square root of number of years of work experience (since saturation effects may eventually set in), and culture was measured as a binary variable, coded 1 for Canada and 0 for USA. We also included dummy variables for the currency trader and bank loan cases.

4.4. Statistical method

All hypotheses were tested with OLS regression. When testing for significance of an interaction term using OLS, a multicollinearity problem arises, since the interaction term

⁴ The software case was placed either second (following the market research case) or third (following the currency trader) in sequence. The order was coded as a binary variable, which was found to be a statistically significant explainer of the escalation intention in the software case. This effect may have arisen from an unforeseen interaction effect with previous cases, in which the decision in the previous cases may have affected the decision in the software case.

⁵ Approximately 2% were eliminated because they failed this manipulation check.

is correlated with the two main effects. If the main effects are themselves important explanatory variables, care must be taken that this correlation does not affect results. We therefore ran two regressions, the first including only main effects, and the second including the interaction. In order to be confident that the interaction term is significant, the coefficients and significance of the main effects found in the first regression should remain essentially unchanged when the interaction term is added, and the interaction term should be statistically significant in their presence. The first regression therefore included the main effects of agency, framing, experience and culture. All three cases were included, requiring two dummy variables to control for case differences. The regression was as follows:

$$\begin{aligned} \text{Decision} = & a_0 + b_1 (\text{agency effect}) + b_2 (\text{framing effect}) + b_3 (\text{culture}) \\ & + b_4 (\text{work experience}) + b_5 (\text{bank loan dummy}) \\ & + b_6 (\text{currency trader dummy}) + e. \end{aligned} \quad (1)$$

The second regression included the interaction term:

$$\begin{aligned} \text{Decision} = & a_0 + b_1 (\text{agency effect}) + b_2 (\text{framing effect}) + b_3 (\text{culture}) \\ & + b_4 (\text{work experience}) + b_5 (\text{agency effect} \times \text{culture}) \\ & + b_6 (\text{currency trader dummy}) + b_7 (\text{bank loan dummy}) + e. \end{aligned} \quad (2)$$

5. Results

Of the 299 respondents, 201 were American and 98 Canadian. The mean (standard deviation) of the number of years of work experience was 4.9 (5.0) years in the USA and 9.6 (7.5) in Canada, confirming that both samples had extensive work experience.

The mean responses of the three cases for each country are shown in Table 1.

It is interesting to note that subjects in both countries were willing to take more risk in both the currency trader and marketing research situations than they were in the bank loan.

Results of the multiple regression analysis of the main effects (Eq. (1)) are shown in Table 2.

Table 1
Mean (S.D.) of escalation scores for each of the cases

Case	USA	Canada
Bank loan	4.63 (2.7)	4.02 (2.4)
Currency trader	6.67 (2.5)	5.73 (2.8)
Market research	5.83 (2.8)	5.72 (2.6)

Higher score = greater willingness to escalate. Scale anchors are: 1 = Definitely preferred not to make the investment; 10 = Definitely preferred to make the investment.

Table 2
Main effects regression results

Variable	Coefficient	<i>t</i> -statistic	<i>P</i>	VIF
Agency conditions	0.75	4.37	.000	1.0
Negative framing	0.81	4.68	.000	1.0
Bank loan dummy	− 1.35	− 6.42	.000	1.3
Currency trader dummy	0.50	2.37	.018	1.3
Work experience	− 0.27	− 3.55	.000	1.2
Country (Canada = 1)	− 0.28	− 1.43	.154	1.2
Adjusted R^2 = .138			.000	

Table 3
Main effects plus interaction

Variable	Coefficient	<i>t</i> -statistic	<i>P</i>	VIF
Agency × Country	− 1.08	− 2.95	.003	2.5
Agency conditions	1.11	5.28	.000	1.5
Negative framing	0.80	4.67	.000	1.0
Country	0.27	0.99	.321	2.2
Work experience	− 0.28	− 3.63	.000	1.2
Bank loan dummy	− 1.35	− 6.44	.000	1.3
Currency trader dummy	0.50	2.38	.018	1.3
Adjusted R^2 = .145			.000	

We then ran the second regression (Eq. (2)) with the hypothesized interaction term included. Results are shown in Table 3. The previously significant coefficients of the main effects remain essentially unchanged, while the coefficient of the interaction of agency and national culture was highly significant ($P < .01$), and in the hypothesized direction. Thus, the hypothesis was supported. The inclusion of the interaction terms increases the adjusted R^2 from .138 to .145. As expected, introducing the interaction term also increased the VIFs, but all are well below the cutoff value of 10 suggested by Neter, Wasserman, and Whitmore (1993). Further, as expected, the propensity to escalate was higher in the presence of adverse selection conditions, negative framing and lower experience.⁶ However, we found no significant culture main effect.⁷

Finally, to further confirm the significance and explanatory power of the interaction term, we performed a stepwise regression, as shown in Table 4. As expected, the three main effects

⁶ For completeness, we also tested for, and failed to find, interactions between experience and framing, experience and agency, and culture and framing.

⁷ Since the Canadian sample was considerably more experienced than the US sample, it is possible that the lack of significance of the culture variable could be attributable to its correlation with experience. However, in separate regressions omitting the experience variable and the agency–country interaction, the country variable remained nonsignificant.

Table 4
Stepwise regression results

Model	Variables included	R^2	R^2 change	Adjusted R^2	F change	Significance of F change
1	BL	.078	.078	.077	75.7	.000
2	BL, NF	.100	.022	.098	21.4	.000
3	BL, NF, Exp	.117	.018	.114	18.1	.000
4	BL, NF, Exp, AG	.136	.018	.132	19.1	.000
5	BL, NF, Exp, AG, AG \times C	.145	.009	.140	9.7	.002
6	BL, NF, Exp, AG, AG \times C, CT	.151	.005	.145	5.7	.018

Variables included in models are as follows: BL — bank loan case dummy, NF — presence of negative framing, Exp — square root of number of years of work experience, AG — presence of adverse selection conditions, AG \times C — interaction of adverse selection conditions and country (Canada=1), CT — currency

add the most explanatory power, but the interaction of agency and country also significantly ($P=.002$) added R^2 .

6. Discussion and conclusions

The strong effect of a relatively small culture difference on managers' response to agency manipulations suggests that Canadians, who are less individualistic than Americans by 11 points on Hofstede's scale, are less susceptible to agency stimuli. It would appear that in the presence of information asymmetry and incentive to shirk, American managers are more likely than Canadians to escalate commitment. This finding, for the relatively small differences in individualism, suggests that the effect of adverse selection conditions in an escalation of commitment situation may be highly country-specific. It further suggests that moderate differences in individualism matter.

The absence of a main culture effect in this study does not refute Chow et al.'s (1997) findings of a main effect for culture, since their main effect was hypothesized to be driven by Confucian values rather than individualism. However, more work needs to be done to explore more carefully the effect of culture on willingness to escalate commitment and to take risks generally.

Our confirmation of the effect of experience suggests that the use of inexperienced student subjects in escalation of commitment research as proxies for managers may overestimate the willingness of managers to escalate. Therefore, the findings of studies in the psychology literature (e.g., Whyte, 1993) using undergraduate student subjects may not be generalizable to manager populations.

The limitations of this study are those common to all pencil-and-paper instruments conducted in a class environment, specifically external validity. The extent to which responses stated are a true reflection of the actions the respondent would have taken in a similar real-world situation is not known, even though in this study, this issue was mitigated because respondents were familiar with the use of cases for teaching. Our sample comprised MBA and executive MBA students, most of whom had several years of management

experience or were currently holding management positions. To the extent that they are not representative of managers in general, the generalizability of our sample to a manager population may be limited. A further limitation may be the consequences of the order effect that we found in the software decision case, in spite of careful pretesting. It is possible that the other cases also interacted in unforeseen ways.

Our findings suggest that the design of a management control and decision support system for project evaluation should carefully address the incentive to shirk and ability to hide information. In addition, the relative emphasis that should be placed on agency theory in the design of this system needs to be adjusted for each culture. This is particularly relevant to US multinationals, because the US has the highest individualism score. Finally, our finding that experience is negatively related to propensity to escalate suggests that it may be possible, and even desirable, to match the experience of employees with the organization's desired task risk profile. For example, junior employees might be more suitable for high-risk decisions such as those involved in venture capital financing. Alternatively, control systems may have to reflect the demographic profile of employees.

Our study suggests a number of avenues for future research into agency effects and escalation of commitment. First, we did not include personality variables, such as self-efficacy (Whyte, Saks, & Hook, 1997), or locus of control (Brownell, 1981), which might have accounted for part of the very large unexplained variation in risk preferences between individuals in this context. Second, although respondents should have been approximately indifferent between escalation and abandonment (by virtue of the experimental design), there were notable differences between the three cases in terms of willingness to escalate commitment. We have a very limited understanding of the case-specific factors that make economically similar escalation decisions so much more attractive than others. Third, while we hypothesized that individualism was the cultural basis for the culture–agency interaction, it may be attributable to some other cultural factor not included in the Hofstede taxonomy. This could be more rigorously tested in a multicountry study.

We have demonstrated that a test of the effect of a small difference in individualism is not only possible but also useful. Since most cross-cultural investments are made between culturally similar countries, our findings suggest that careful testing for the effects of culture between economically significant countries (such as those within the Anglo or Nordic clusters) could be worthwhile.

Acknowledgments

We gratefully acknowledge the financial support of the CGA-Canada Research Foundation, The University of Cincinnati Canadian Business Studies Program and The University of Western Ontario Plan for Excellence for this project. We also acknowledge the helpful comments of anonymous reviewers, and participants at workshops at Macquarie University, Massey University, Murdoch University, University of New South Wales and Victoria University of Wellington.

APPENDIX

The Bank Loan.

Background

You are a senior corporate loan officer in the London, England, subsidiary of an international bank. It is 7 August 1995, and it looks like today will be interesting.

(No adverse selection condition) You have to reach a decision on a \$500,000 loan to The Industrial Fastenings Company, a medium-sized company listed on the local stock exchange which manufactures nuts and bolts for a variety of industrial and domestic applications. You have full authority to make the loan, but like all loans, a copy will be included in the daily loan report to head office. Details of the loan are in the briefing note below.

(Adverse selection condition) First, you have to reach a decision on a \$500,000 loan to The Industrial Fastenings Company, a medium-sized company listed on the local stock exchange which manufactures nuts and bolts for a variety of industrial and domestic applications. You have full authority to make the loan, but like all loans, a copy will be included in the daily loan report to head office. Details of the loan are in the briefing note below.

Second, you have just received a phone call from a director of a private, very prestigious successful but conservative Swiss bank. He has indicated that he is very impressed with your record as a profitable but prudent banker with no client bankruptcies, and would like you to be a candidate for their Managing Director and CEO position when the current CEO retires on December 31 1995. The prestige, location and opportunity are all very attractive to you.

Briefing Note on Industrial Fastenings Company

Some years ago, you approved a loan to The Industrial Fastenings Company, \$1 million of which is still outstanding and overdue. However, in accordance with bank's conservative accounting policy, all of this amount has already been written off internally over the last three years, and had no significant impact on the bank's profitability. Because of various tax credits, the bank pays no income taxes at the present time, so loan write-offs have no tax effect.

The Industrial Fastenings Company is now in a very precarious financial position and if you do not make the loan will cease trading before the year-end. The company's present precarious financial position is caused by a lack of up-to-date machinery in one important process, which has caused the company to become uncompetitive. If you lend the \$500,000 to purchase the new machine, provided that the economy does not decline, The Industrial Fastenings Company will very quickly generate cash flow in excess of \$1.5 million, allowing the repayment of both of the loans and interest in full. If, however, the economy declines, the company will likely survive into 1996, but will inevitably be bankrupt and unable to repay any loans, and since the machine is highly customized, the bank will recover nothing. The bank's economic forecasting section estimates a 2/3 probability of economic decline.

Alternatives

Based on the above, you summarize your choices as follows:

(Neutral Framing)

- 1. If you do not grant the loan, you will save \$500,000.
- 2. If you grant the loan, there is a 2/3 probability that no money will be saved (recovered) and a 1/3 probability that \$1.5 million will be saved (recovered).

(Negative Framing)

- 1. If you do not grant the loan, the loss will definitely be \$1 million.
- 2. If you grant the loan, there is a 2/3 probability that the loss will be \$1.5 million, and a 1/3 probability that the loss will be zero.

Decision:

- Please choose one of the following:
- 1. Do not grant the loan _____
 - 2. Grant the loan _____

Please indicate the *strength* of your preference for the choice you made by marking an 'X' at the appropriate point on the scale:

I definitely preferred 1 | | | | | | | | | | I definitely preferred 2

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A comparison of factors affecting UK and US analyst forecast revisions

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Abstract

An important task of the sell-side financial analyst is to provide investors with estimates of corporate earnings per share (EPS). In this study, we examine if analysts from countries with comparable equities markets, regulatory requirements, accounting standards, and disclosure policies are influenced by similar factors in revising an earnings estimate. The results of a survey sent to UK and US financial analysts indicate that in general the two groups do consider the same factors to be important. However, there are significant differences in the relative importance of some of the factors examined. These differences are most likely attributable to the more international focus of the UK analyst and the greater reliance of the US analyst on guidance from management. © 2001 University of Illinois. All rights reserved.

Keywords: Analyst forecast revisions; Earnings per share; Financial analysis; Sell-side analysts; United Kingdom; United States

1. Introduction

With increased globalization, investors are seeking opportunities in nondomestic equity markets. For example, by the year 2000, it is expected that US institutional and individual investors will have between 15% and 20% of their assets in non-US markets (Coyle, 1995). At the end of December 1999, UK institutional investors had approximately 24% of their investments in non-UK securities (Riley, 2000). Since the quality of corporate information

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and level of disclosure can vary significantly from country to country, the role of the local financial analyst is becoming increasingly important. A primary function of the analyst is to serve as information intermediary between management and the investment community. Investors rely on the analyst's research, recommendations, and earnings forecasts in buying and selling securities. Since analysts are assumed to be expert users of financial information, it is useful to understand what information they find most relevant in forecasting the financial performance of a firm.

The accuracy of an analyst's recommendations and estimates is related to many elements. These elements include, among others, the experience, preparation, and educational background of the analyst. Analyst performance is also influenced by country-specific factors such as the size and activity of the country's equities market, national professional requirements, and the presence or absence of large international brokerage and investment firms. The main objective of this study is to examine whether analysts in two countries with developed equity markets, the UK and US, consider comparable factors and weight them similarly in forecasting firm performance.

To compare the two groups of analysts, we examine a common task performed by financial analysts, forecasts of corporate earnings per share (EPS). A survey research design is used to determine the importance of factors used by US and UK analysts in revising an earnings forecast. In general, we anticipate that the selection of factors between the two groups will be similar. Both countries have highly developed security markets. In addition, many of the large international investment/brokerage firms (e.g., Merrill Lynch) have a presence in both countries. Furthermore, the training and certification process of the UK and US analyst is similar. Finally, reporting requirements and accounting standards in the two countries are comparable. Nonetheless, we expect the *relative importance* of certain factors in revising an earnings forecast to differ. Cultural and country-specific differences between the two groups should impact the level of importance of certain factors. For example, the more international focus of the London Stock Exchange (LSE) should increase the importance of international events for the UK analyst. On the other hand, the proliferation of new economy companies on US stock exchanges, in particular the NASDAQ, creates a particular challenge to the US analyst. With fewer years of company-specific financial data available, analysts in the US place greater reliance on guidance by management¹ and conversations with customers and suppliers.

The results of the study will contribute to a better understanding of the factors used by the two groups of analysts in revising an earnings forecast. This understanding can be used to develop country-specific models that better predict consensus analyst forecasts. In addition, the results will provide some testable hypotheses in future studies examining forecast accuracy between the two groups of analysts.

The remainder of the paper is organized as follows. Background on the securities market and the financial analyst profession in the US and UK as well as a review of the related

¹ Anecdotal and survey data (e.g., Lees, 1981) provide evidence that selective disclosure by management is fairly common in the US. Frequently, financial information released by management is not issued to the general public but rather to selected individuals. In general, financial analysts have been the primary beneficiaries of these disclosures.

literature are presented in the second section. The third section describes the research design. Test results are reported in the fourth section. The fifth section presents the conclusions of the study and recommendations for further research.

2. Background

Although differences are expected in the level of importance of factors involved in forecast revisions of US and UK analysts, little difference is expected in the actual factors selected as important by the two groups. There is a great deal of similarity in the securities markets, regulatory process, reporting requirements, and the professional preparation and evaluation of analysts in the two countries. These similarities are discussed in the following sections.

2.1. Securities market

The US and the UK have highly developed securities markets with similar listing requirements. As Table 1 illustrates, the major stock exchanges in each country, the LSE and the New York Stock Exchange (NYSE), are similar in terms of the number of companies listed at the end of 1997. Although the LSE has a higher percentage of foreign listings (17.6%) than the NYSE (11.7%), the number of companies listed on each exchange is approximately 3000. The daily volume of shares traded during 1997 is substantially greater on the LSE than the NYSE. However, total market capitalization of companies listed is over three times greater on the NYSE. Institutional investors have a greater percentage of share ownership at the end of the third quarter of 1996 on the LSE (58.3%) than the NYSE (45.6%). Not surprisingly, overseas holders also represent a larger percentage of share ownership on the LSE (15.9%) than the NYSE (6.8%).

Table 1
General information on the LSE and NYSE^a

	LSE	NYSE
Listed companies at 12/31/1997		
Domestic	2465 (82.4%)	2691 (88.3%)
Foreign	526 (17.6%)	356 (11.7%)
Total	2991 (100.0%)	3047 (100.0%)
Market capitalization at 12/31/1997 in millions of 1997 US\$	2,049,459	6,595,209
Daily average no. of shares trades in 1997 ('000,000)	2281.84	526.93
Percentage share ownership (third quarter 1996)		
Pension, insurance, and mutual funds	58.3%	45.6
Households and nonprofit organizations	20.8%	47.5
Overseas holders	15.9%	6.8
Other	5.0%	0.1

^a Information from *World Stock Exchange Fact Book*.

2.2. Regulatory agencies

British company law is based on two Companies Acts, the Companies Acts of 1985 and 1989. These two Acts consolidate the prior Acts of 1947, 1948, 1987, 1980, and 1981. Directors of companies must send a copy of their company's annual accounts to the Registrar of Companies. Public companies have 7 months from their financial year-end to deliver their audited financial accounts. Companies whose shares are traded on the LSE are required to issue their annual report within 8 months of their financial year-end. However, the expectation is that the report will be issued within 2–4 months. Any changes in a company's structure, management or assets must also be promptly reported to the Registrar of Companies and the LSE. For example, Section 288 of the Companies Act of 1985 requires that notification of any changes among directors and secretaries be made within 14 days. Heavy penalties are levied against directors and others responsible for issuing financial reports that misstate items or knowingly omit the disclosure of material events.

In the US, the Securities and Exchange Commission (SEC) plays a role similar to that of the Registrar of Companies. The SEC is a federal agency created to administer the Securities Exchange Act of 1934 and several other acts. The agency exercises oversight for companies listed on the major US stock exchanges. Similar to its UK counterpart, the SEC requires companies within its jurisdiction to file audited financial statements. Updates are also required (Form 8-K) following any event having a potentially material effect on the company.

The SEC has the authority to prescribe accounting practices and standards for companies within its jurisdiction. It is charged with protecting the interest of investors through the release of accurate and timely financial reports and disclosures. However, in practice, accounting standard setting has been delegated, for the most part, to professional groups such as the Financial Accounting Standards Board (FASB).

2.3. Accounting principles and standards

The UK and the US have developed a comparable set of generally accepted accounting principles for financial reporting purposes. In both countries, this set of standards is distinct from those used for tax reporting. The framework of financial reporting is similar in the two countries. In the UK the Financial Reporting Council provides guidance on priorities and broad policy issues to the Accounting Standards Board (ASB) and the Financial Reporting Review Panel. The ASB is responsible for issuing accounting standards. It operates under a *due process* system. The Board issues exposure drafts and discussion papers and invites comments from interested parties as part of the standard-setting process.

Authorized under the Companies Act of 1985, the Financial Reporting Review Panel has the power to apply to the courts for orders to review the reporting practices of public companies. An Urgent Issues Task Force (UITF) and an Auditing Practices Board complete the list of parties involved in the standard-setting process. The UITF is a committee of the ASB. The ASB advises on areas of unsatisfactory or conflicting interpretations of accounting standards.

Standard setting in the US involves a similar organizational arrangement. Since 1973, a structure composed of three organizations has assumed the primary responsibility for the establishment of financial accounting standards. The three organizations are the Financial

Accounting Foundation (FAF), the FASB and the Financial Accounting Standards Advisory Council (FASAC). The FAF oversees the activities of the other two organizations. In addition, it selects the members of the FASB and FASAC and funds their activities. The FASAC consults with the FASB on major policy and technical issues. The seven members of the FASB have the responsibility for developing accounting standards through a system of due process, similar to that described above for the UK. The Emerging Issues Task Force, a committee of the FASB, is similar in purpose to the UITF.

There is a great deal of similarity between the standard-setting structure and process in the UK and US. As previously noted, both countries have highly developed and active equity markets. Listed companies are subject to considerable regulation and oversight by federal agencies. A primary objective of these agencies is to protect market participants by requiring prompt and complete reporting and disclosure by companies within their jurisdiction. In both the US and the UK, sell-side analysts provide a valuable service to investors by using financial reports as well as information from management and other sources to evaluate firm performance and forecast future earnings.

2.4. Sell-side analysts

Financial analysts are usually classified as either buy-side or sell-side. The buy-side analyst is a buyer and seller of equities. Generally, he or she works as a portfolio manager for a mutual fund, pension fund, bank, or insurance company. The sell-side analyst typically works in a brokerage/investment firm and serves as information intermediary between corporate management and the investment community. The buy-side analyst looks to the sell-side analyst for recommendations and earnings estimates. In general, the sell-side analyst does not actively trade securities on behalf of his or her employer. However, in smaller investment firms, the analyst might perform both buy-side and sell-side functions. Arnold and Moizer (1984) describe buy-side analysts as *investor analysts* and sell-side analysts as *advisor analysts*.

Both the UK and the US have financial analyst organizations that provide standards and requirements for professional certification. In the UK, the regulatory authorities have approved the Institute of Investment Management Research (IIMR) to perform these functions. Formed in 1955, the IIMR is the provider of the Investment Management Certificate, the benchmark examination for individuals in the profession. Some of the IIMR's stated objectives are the following (IIMR, 1996):

- to foster and maintain high standards of professional ability and practice in investment analysis, portfolio management and related disciplines;
- to encourage the creation and interchange of ideas and information among those engaged in these activities;
- to improve the standards of corporate information; and
- to support and promote the interests of the investment community.

In the US, the Association for Investment Management and Research (AIMR) plays a similar role to that of the IIMR. In its Mission Statement, the AIMR states that its objective is to establish and maintain the highest standards of professional excellence and integrity.

To achieve this objective, the AIMR administers the Chartered Financial Analyst (CFA) exam. In addition, the organization establishes and maintains performance presentation standards for the industry. These standards extend beyond CFA members to the general financial community.

In both the UK and the US there are annual polls designed to identify the *best* analysts. Each October, the US journal, *Institutional Investor*, publishes its “All-American Research Teams.” To determine first, second, and third All-American team members, the journal polls approximately 2000 money managers. Selection to a team is based on overall rankings in four areas: (1) accuracy of EPS estimates, (2) stock recommendations, (3) written reports, and (4) overall service. Selection to one of the teams is important recognition for an analyst. Stickel (1992, p. 1811) finds that “a position on the All-American Research Team can be viewed as a proxy for relative reputation.”

Since 1974, Extel Financial, a member of the United Newspapers group, has provided a ranking of UK analysts. Several US-based brokerage firms (e.g., Merrill Lynch, Goldman Sachs, Morgan Stanley Dean Witter) placed among the top 10 firms on the 1998 annual survey. Many of the large UK brokerage houses have been taken over by American or European companies (e.g., Merrill Lynch’s acquisition of Smith New Court). The presence of large US brokerage firms in the UK is expected to contribute to similarities among analysts in the two countries.

2.5. Comparative analyst forecast accuracy and appraisal methods

In a comparative study of the UK and US analysts, Cho (1994) reports that analyst forecast errors are much higher for US analysts. Cho and Pitcher (1995) examine the accuracy of analyst earnings forecasts in 11 countries. Their findings indicate a tendency toward overoptimism in the forecasts of all countries included in the study. In a similar study of 13 European countries, Capstaff, Paudyal, and Rees (1995) examine the accuracy and rationality of analyst earnings forecasts. They consider whether the forecasting environment in each country can explain the differences identified. Their results suggest that some differences are country-related.

The empirical research on security appraisal methods adopted by financial analysts in evaluating securities and sources of information used is very limited. Belkaoui, Kahl, and Peyrard (1977) examine the relative importance of 29 items of information to US, Canadian, and European analysts. Their results indicate significant differences between European and North American analysts concerning the relative importance of the various items of information. Chang and Most (1981) find that the most important sources of information for both UK and US analysts are corporate annual reports and communications with management. However, their findings indicate that communications with management are more important to UK than US analysts. This result is inconsistent with the findings of Arnold, Moizer, and Noreen (1984) who report no significant difference between UK and US analysts as to the importance of management communications. Chang and Most also find that the statement of cash flows, the auditor’s report, and advisory services are more important to US analysts. On the other hand, the Chairman’s statement is perceived to be a more valuable source of information by UK analysts.

In a comparative study on the appraisal of ordinary shares by investment analysts in the UK and Germany, Pike, Meerjanssen, and Chadwick (1993) find a definite shift in attitude towards personal company contacts and meetings as the most important sources of information for UK analysts. In addition, fundamental analysis, using a P/E multiple, remains the dominant valuation method. They also report that in spite of their theoretical superiority, discounted cash flow and beta analysis enjoy little support in practice. In contrast, German analysts attach greater importance to technical analysis and place slightly more importance on new nonfinancial company information, particularly information regarding research and development and product quality. In another comparative study of the procedures used by UK and US financial analysts in evaluating equities, Arnold et al. (1984) report that fundamental analysis is the most frequently used technique. Technical analysis, beta analysis, and modern portfolio theory lag well behind fundamental analysis in terms of relative importance and usefulness.

The primary objective of this study is to examine and compare the relative importance of factors affecting analyst forecast revisions in the UK and US. The rationale for the study stems from the scarcity of evidence of the type of information that analysts use to revise their earnings forecasts. A deeper understanding of factors influencing EPS revisions by analysts is important since there is overwhelming evidence of a significant correlation between analyst earnings estimates and securities prices. (See Brown, Foster, & Noreen, 1985 for a review of this literature.)

3. Research design

3.1. The survey

A questionnaire is used to identify the relative importance of 38 factors in revising an earnings estimate for UK and US analysts. The factors include economic and company-specific considerations. The factors were determined based on interviews with financial analysts and related studies (e.g., Lees, 1981) in the literature.

The questionnaire consists of three sections. The first section includes 17 questions on the respondent's background including age, experience, and job requirements. The second section presents 38 factors involved in analyst forecast revisions.² The respondent is asked to indicate the level of importance of each factor on a 5-point Likert scale. Responses range from *extremely important* (5) to *not important* (1). The final section asks the respondent to rank the five most influential factors in order of decreasing importance. This section is used to assess the internal validity of the instrument. Responses to section three should be correlated with those in the second section. The ranking of factors by both UK and US respondents are consistent with the relative importance attributed to the 38 factors in the second section of the questionnaire.

² The US questionnaire includes 43 factors. However, four of these were eliminated from the UK survey for being too US-specific. In addition two factors in the US survey were combined for the UK questionnaire.

The questionnaire was pilot tested at an investment firm in New York City. A Senior Vice President at the firm administered the test. Additional adjustments were made to the questionnaire based on the comments of participants in the pilot test. Although the US and UK questionnaires are essentially identical, some modification was necessary due to cultural and institutional differences. For example, one factor listed on the US survey is the following: *Changes in the discount rate by the Federal Reserve*. On the UK survey, “Bank of England” replaces “Federal Reserve.” In addition, there are slight differences due to language. On the US questionnaire, survey participants are requested to “check” the level of importance of each factor in revising EPS. On the UK questionnaire, participants are instructed to “tick” the appropriate level.

The US survey was sent to 2000 practicing financial analysts. The participants were randomly selected from 22,000 members based on a list provided by a major professional organization of investment practitioners. A first mailing generated 287 responses (14%). A second mailing resulted in an additional 83 responses. In all, 370 responses were received for an 18.5% response ratio. Of the respondents, 132 identified themselves as sell-side analysts.

The UK survey was sent to all UK financial analysts at firms registered with IBES. Of the 804 questionnaires mailed, 104 analysts responded (12.94% response rate) to the first mailing. A second mailing to the 700 nonrespondents resulted in 47 additional completed questionnaires. The total response rate from the two UK mailings is 18.8%. Of the 151 questionnaires returned, 16 were from buy-side analysts. The elimination of these resulted in 135 questionnaires from sell-side analysts used in testing.

Tests were performed for nonresponse bias. To assure that the US sample was randomly selected, chi-square tests were made on the set of available demographic characteristics (e.g., industry specialty, occupation classification). Results indicated no significant differences. A second test based on the return dates of the questionnaires was made on both samples. In this test, late respondents proxy for nonrespondents (Oppenheim, 1966, pp. 34–35). Hotelling’s T^2 was used to test the equality of the multivariate means of the two groups for both the UK and US samples. There was no significant difference between early and late respondents.

3.2. Tests

A model is developed to test for differences between UK and US analysts in the relative importance of various factors in revising an EPS estimate. Principal components analysis with a Varimax rotation (see Kaiser, 1960) is used as a variable-reducing mechanism to develop a more parsimonious model. This procedure reduces the 38 factors to eight variables based on criterion developed by Cattell (1966).³ A two-group multivariate analysis of variance (MANOVA) with country (US, UK) as the grouping variable and the eight factors as criterion variables is used to test the model.

³ Cattell (1966) uses a graphical method called the *scree test* as a criterion for determining the number of components to retain. Typically, the magnitude of the eigenvalues of the principal components drops off sharply in a steep descent and then tends to level off. Cattell provides evidence that retaining all components before the leveling off point is an appropriate criterion for deciding the number of components to consider.

4. Results

4.1. Descriptive statistics

Table 2 presents a background comparison between the 132 US and the 135 UK respondents identified as sell-side analysts. The two groups are similar in the number of male and female respondents. Approximately 19% of the US analysts are female. The percentage is slightly lower (16%) for the UK group. However, the difference between the two groups is not considered significant at conventional levels.

There is a significant difference in the age, education, and experience of the two groups. On average, the US respondent is 49 years old, has an MBA or equivalent, and has 14.6 years of experience. On the other hand, the average UK respondent is 37 years old, has an undergraduate degree, and 8.9 years of experience. This profile of the UK analyst is similar to that found in other studies. For example, in a study by Pike et al. (1993) involving 92 UK respondents, the average age of the analyst is 34.2 years and the average work experience is 8.7 years.

There are several explanations for the significant difference in age between the average US and UK respondent in this study. First, during the latter half of the 1980s, the LSE underwent substantial technological changes. These changes resulted in increased efficiency and liquidity for the LSE. During this period, according to Pike et al. (1993), there was the introduction of a large number of new analysts as a result of the reforms at the LSE. Second, some of the largest UK brokerage/investment firms are subsidiaries of such US firms as Goldman Sachs, Merrill Lynch, and Morgan Stanley Dean Witter. These firms have not had a long presence in the UK. Therefore, the average tenure per employee is most likely lower than for their US counterpart.

The difference in age is reflected in the lower level of education and experience between the two groups. Of the 132 US analysts, 99 (75%) have an MBA or equivalent

Table 2
Descriptive statistics: mean (median) of background information on US and UK analysts

	US	UK
Number of sell-side analysts	132	135
Gender:		
Female	25	21
Male	107	114
Age	49	37***
Year of birth	1951 (1953)	1963*** (1964)
Education ^a	3.8	3.4***
Years of experience	14.8 (12.0)	8.9*** (8.0)
Number of companies followed	58 (17)	41 (18)
Number of industries monitored	3 (2)	3 (2)
Number of forecast revisions per firm, per year	1.7 (3)	1.6 (3)

^a 3 = undergraduate degree; 4 = MBA or equivalent.

*** Significant at the .001 level.

degree, and 2 (1.5%) have doctorates. The figures for the UK group are 36 (27%) and 11 (8%), respectively.

Although the number of companies followed by US and UK analysts is significant, the reported numbers (55 and 40, respectively) are skewed to some degree by outliers. Some analysts indicated they followed more than 200 companies. The median figures (17 and 18, respectively) are probably a better indicator. Nonetheless, in their survey of UK investment analysts, Arnold and Moizer (1984) report that the average number of companies analyzed regularly by the 202 analysts in their sample is 40.9. However, analysts surveyed in the Pike et al. (1993) study monitored an average of 28 companies in 3.5 industry sectors.

Both the US and UK respondents follow an average of three industries. There is no significant concentration by either group in a particular industry. There are between 30 and 35 industries represented by the respondents. For the US sample, the highest single concentration of analysts is in banking (seven analysts or 5% of the sample). Each of the following industries is followed by three US analysts (2% of the sample for each group): restaurants, retailing, telecommunications, energy, and furniture. For the UK sample, the greatest concentration of analysts are in the following industries: 11 (8%) of the analysts follow engineering firms, 7 (5%) pharmaceutical firms, 6 (4%) electric utility companies, 5 (3.7%) telecommunication companies, 5 (3.7%) banks, and 5 (3.7%) media companies. The number of analysts using models to forecast earnings is 110 (83.3%) and 105 (77.7%) for the US and UK, respectively.

4.2. Principal components

The results of principal components analysis with a Varimax rotation are presented in Table 3. The procedure reduces the 38 factors from the questionnaire to eight criterion variables (principal components) with eigenvalues ranging from 1.3 to 6.5. Each of the components is described below.

Table 3
Principal components, variable name, Eigenvalues, percent of total variance, and cumulative percentage

Principal component (sample question)	Variable name	Eigenvalue	Percent of variance	Cumulative variance percentage
1. Other analysts' recommendations.	OTHERAN	6.51255	16.7	16.7
2. Stock market activity.	STOCK	4.63281	11.9	28.6
3. Management conference calls.	MANAGEMENT	2.90922	7.5	36.0
4. Regulatory changes by government agencies.	REGS	2.41561	6.2	42.2
5. Meetings with suppliers.	EXTRINFO	2.07232	5.3	47.5
6. Management's downward revision of EPS.	MGMTFCST	1.59136	4.1	51.6
7. Change in discount rate.	COSTCAP	1.52062	3.9	55.5
8. Change in economic/political environment.	MACRO	1.29606	3.3	58.8

4.2.1. *Other analysts' recommendations (OTHERAN)*

The first component incorporates other analysts' recommendations and EPS forecasts and has the largest factor loading (i.e., the component accounts for the greatest amount of the variance). The component includes questions from the survey regarding other analysts' upward and downward revisions of EPS, forecasts issued by a leading analyst in the industry, informal conversations with other analysts, and the importance of other analysts' buy and sell recommendations.

4.2.2. *Stock market activity (STOCK)*

The component with the second largest factor loading involves stock market activity related to the company. Questions from the survey include those associated with significant (5% or greater) changes in share price, significant (10% or greater) changes in volume, and significant buying and selling by insiders.

4.2.3. *Formal and informal information from management (MANAGEMENT)*

The component with the third largest factor loading incorporates questions related to information provided by management. These include information released through formal channels, such as corporate conference calls, analyst meetings, and press releases. However, the component also includes information provided by management in informal settings, such as on-site visits to the company by the analyst and informal meetings between the analyst and one or more officers of the company.

4.2.4. *Regulatory environment (REGS)*

The fourth principal component involves factors related to the regulatory environment. It includes questions involving changes in regulations by the federal government as well as financial accounting changes mandated by UK or US GAAP.

4.2.5. *External information sources (EXTRINFO)*

The fifth principal component involves information about the company provided by external sources. These sources include suppliers and customers of the company. In addition to conversations the analyst has with these two groups, the component also incorporates information obtained informally about the company at trade shows.

4.2.6. *Management's forecast of EPS (MGMTFCST)*

The sixth principal component reflects earnings projections by management. It includes both upward and downward revisions of EPS.

4.2.7. *Cost of capital (COSTCAP)*

The seventh principal component consists of factors affecting a company's cost of capital. These include federal changes in monetary policy and the discount rate. The component also considers changes in the commercial paper and bond ratings of the company by rating agencies such as Standard and Poor's. Such changes reflect the risk to investors and creditors of providing funds to the company. If a rating agency downgrades a company's debt securities, the company's cost of capital is higher reflecting the increased level of risk.

4.2.8. Macroeconomic environment (MACRO)

The eighth principal component includes factors related to the macroeconomic environment. These include changes in the international or political environment as well as industry data and reports.

4.3. Tests of the model

A MANOVA procedure is used to compare differences in the relative importance of factors to US and UK analysts in revising an EPS forecast for a company. For this test, Country (US/UK) is the grouping variable. The eight principal components described above are the criterion variables. Results of the testing appear in Table 4.

Based on several tests (Wilks' lambda, Pillai's trace, and Hotelling–Lawley trace), the overall model proves highly significant at the .001 level (see Table 5, panel A). In order to determine on which factors UK and US analysts differed, univariate *F* tests are made on the eight criterion variables. The results are reported in Table 4, panel B. Five of the criterion variables are significant: OTHERAN, MANAGEMENT, EXTRINFO, MGMTFCST, and MACRO. US analysts tend to consider OTHERAN and EXTRINFO more important in revising an earnings estimate; UK analysts place greater emphasis on MGMTFCST and MACRO. Both consider information from management important (MANAGEMENT). However, in an analysis of the factors comprising this variable, UK

Table 4
MANOVA and univariate *F* tests

Panel A: Two-way MANOVA testing overall significance of the model with country (US/UK) as the grouping variable and the eight factors as the dependent (criterion) variables

Test name	Number of respondents	Value	<i>F</i> statistic	Significance of <i>F</i>
Pillai's trace	265	.48612	23.53115	.000
Hotelling–Lawley trace	265	.94598	23.53115	.000
Wilks' Lambda	265	.51388	23.53115	.000

Panel B: Univariate *F* tests

Variable	Hypothesis SS	<i>F</i> Statistic	Significance of <i>F</i>
OTHERAN	8.95267	9.31217	.003
STOCK	1.39417	1.39685	.239
MANAGEMENT	20.05246	22.09607	.000
REGS	.49388	.49267	.484
EXTRINFO	5.14297	5.24852	.023
MGMTFCST	21.52522	23.90727	.000
COSTCAP	1.87519	1.88319	.171
MACRO	41.19008	51.17399	.000

Grouping variable: country. Criterion variables: OTHERAN, STOCK, MANAGEMENT, REGS, EXTRINFO, MGMTFCST, COSTCAP, and MACRO.

Table 5
MANOVA and univariate *F* tests for subsample of analysts with 10 years or less of experience

Panel A: Two-way MANOVA testing overall significance of the model with country (US/UK) as the grouping variable and the eight factors as the dependent (criterion) variables

Test name	Number of respondents	Value	<i>F</i> statistic	Significance of <i>F</i>
Pillai's trace	135	.47759	10.62758	.000
Hotelling–Lawley trace	135	.91420	10.62758	.000
Wilks' Lambda	135	.52241	10.62758	.000

Panel B: Univariate *F* tests

Variable	Hypothesis SS	<i>F</i> statistic	Significance of <i>F</i>
OTHERAN	1.98465	2.50816	.116
STOCK	2.19603	2.43081	.122
MANAGEMENT	10.78656	12.39143	.001
REGS	3.94294	4.36428	.039
EXTRINFO	2.08010	2.14219	.146
MGMTFCST	12.55438	13.99507	.000
COSTCAP	3.61990	3.27067	.074
MACRO	14.84816	19.02447	.000

Grouping variable: Country. Criterion variables: OTHERAN, STOCK, MANAGEMENT, REGS, EXTRINFO, MGMTFCST, COSTCAP, and MACRO.

analysts find formal announcements more important. US analysts tend to regard informal information as more significant.⁴

Although both groups consider other analysts' recommendations and estimates only slightly to moderately important, US analysts place significantly greater importance on forecasts and recommendations issued by their colleagues. This result might reflect the level of experience between the UK and US analysts in the sample rather than the countries involved. In their study, Williams and Moyes (1997) find that the greater the level of experience, the higher the likelihood that the analyst will consider other analysts' forecasts and recommendations in revising an EPS forecast. They conclude that the more experienced the analyst, the less stigma attached to considering other analysts' reports. In addition, experienced analysts are better able to determine which of their colleagues' EPS forecasts are likely to be more accurate. This finding is supported by another study (Clement, 1999) that shows that forecast accuracy is positively associated with analyst experience.

Similarly, although both groups consider comments from suppliers and customers of firms only slightly to moderately important, the US analyst places greater weight on these

⁴ This finding provides a possible explanation for the inconsistency found in prior studies. Recall that Chang and Most (1981) provide evidence that UK analysts rely more heavily than US analysts on information from management, whereas Arnold et al. (1984) report no difference between US and UK analysts in this regard. In this study, we distinguish between the types of information provided by management (formal or informal). In studies that did not make this distinction, test results might be more difficult to interpret.

outside sources when revising an earnings estimate. Williams and Moyes (1997) also find that more experienced analysts consider more rather than fewer factors in EPS revisions. This finding is consistent with results reported in studies (e.g., Chiesi, Spillich, & Voss, 1979) involving unprogrammed situations, such as EPS forecasts. In such situations, experienced individuals are more likely to use a *quantity strategy* regarding the number of factors considered. That is, they consider more factors than their less experienced colleagues in reaching a decision. However, they are able to appropriately weigh the most relevant data. On the other hand, less experienced individuals restrict the number of factors considered in unprogrammed situations.

Both groups indicate that management earnings forecasts (MGMTFCST) are extremely important. However, while UK analysts consider such forecasts as the most important of all factors listed, other factors, such as informal meetings with management, are ranked higher for US analysts.

International, political, economic, and industry events (MACRO) range from moderately important to important for both groups. Nonetheless, the relative difference in importance is highly significant with the UK analyst placing greater weight on such events. One explanation for the difference in importance is that UK analysts have a more international focus. The LSE has a greater number of foreign companies listed than US exchanges. In addition, as previously noted, the number of international investors is higher in the UK than in the US.

There is a significant difference in the level of importance of information from firm management (MANAGEMENT). However, in examining the factors included in the variable, there are two areas affecting the difference: formal and informal information. UK analysts consider formal information (e.g., conference calls, analysts' meetings with management) more important, while US analysts place greater emphasis on informal information (e.g., one-on-one discussions with management during on-site visits). This difference might be reflective of the relationship between management and the analyst in the two countries. Lees (1981) suggests the possibility of *selective disclosure* in the US whereby certain analysts are privy to forward-looking information from management that is not made available to the general public. In an interview for this study, an analyst likened the information-gathering process in the US to constructing a "mosaic." The analyst must look beyond official pronouncements from the company. To complete the mosaic depicting the company's future financial situation, the analyst relies on informal conversations with management and others. Williams, Moyes, and Park (1996, p. 115) report that, according to one Senior Analyst interviewed, "traditional forms of analysis are being replaced... by a more 'action oriented' approach involving 'gossip' and 'rumors'. The process involves the gathering of 'soft' or informal information from a variety of sources in order to construct a picture of future firm performance."

Recently, the SEC has expressed concern about the disclosure of material firm-specific information by management to selected analysts and investors. The Commission views such disclosures as a threat to the integrity of the securities market. In October 2000, the Commission issued Regulation FD (or "Fair Disclosure"). In the regulation, effective October 23, 2000, the SEC cited (Securities and Exchange Commission, 2000, p. 3) "the potential for corporate management to treat material information as a commodity to be used

to gain or maintain favor with particular analysts or investors.” Regulation FD requires management to simultaneously disclose to analysts and the general public in *broad, nonexclusionary distribution* all material corporate information.

4.4. Additional tests

Since experience has been shown to influence the selection of factors by a US analyst in revising an EPS forecast (Williams & Moyes, 1997), additional testing was performed controlling for this variable. The UK and US samples were subdivided into two groups based on years of experience. Analysts with 10 years or less of industry experience are classified as *low experience*; those with more than 10 years represent *high experience*. The 10-year division is based on a study by Chase and Simon (1973). They find that it takes approximately 10 years for an expert to master a domain. Using the 10-year criteria, 54 UK analysts were placed in the high-experience group while 81 were in the low-experience group. The US had considerably more in the high (77) than in the low (54) experience group.

A MANOVA test was made on both the high- and low-experience groups using the same model as for the prior test. The grouping variable was *Country*. Results of the test for the low-experience group are presented in Table 5. Results for the high-experience group (not shown) are similar to those for the full sample.

Three of the variables for the full sample continue to be significant when comparing UK and US analysts with 10 years or less experience, MANAGEMENT, MGMTFCST, and MACRO. In addition, REGS is moderately significant with a *P* value of .039. Recall that this variable indicates the level of importance of regulatory changes by government agencies as well as accounting changes to UK or US GAAP. Although both groups of analysts with experience of 10 years or less consider the components of this variable to be moderately important, UK analysts tend to place greater weight on government changes while US analysts consider changes to GAAP more important. The findings of the additional tests indicate that differences between UK and US analysts should not be attributed to differences in the experience level of the two groups.

5. Conclusion

This study examines the difference in the relative importance of factors considered in a common task performed by UK and US analysts, an EPS forecast revision. There is a great deal of similarity between the two countries in regard to the size and importance of equity markets, regulatory procedures, government oversight, the financial accounting standard-setting process, and professional certification of analysts. This paper examines whether sell-side analysts in the UK and US are also similar in their consideration of factors leading to an earnings forecast revision.

An examination of the importance of factors used in revising an EPS estimate indicates a great deal of similarity between US and UK analysts. However, the weighting (i.e., the relative importance) of these factors differ between the two countries. UK analysts place somewhat more importance on macroeconomic factors, such as international economic and

political events. This finding is not unexpected given the greater international focus of the UK and the larger number of foreign companies listed on the LSE. Although considered extremely important by both groups, UK analysts place greater weight on management's forecast of EPS. They also attach more importance to formal releases of information (e.g., corporate press releases) by management.

For their part, US analysts consider forecasts and recommendations by other analysts to be more important than UK analysts. In addition, US analysts attach greater importance to comments from suppliers and customers and informal conversations (e.g., during on-site visits) with management.

Since there is a significant difference in the number of years of industry experience between the two groups, we repeat tests of the model controlling for experience. As the results are similar to those of the initial test, we conclude that country-specific issues rather than experience are responsible for the significant differences in the level of importance of certain factors considered in revising an earnings forecast.

5.1. Suggestions for future research

The results of this study indicate several areas for future research. First, this paper examines only one task performed by UK and US sell-side analysts — earnings forecast revisions. Future studies could examine other tasks, such as buy and sell recommendations, issued by these two groups. Second, there are few empirical studies comparing the forecasting ability of these two groups of analysts. Data availability has now made such comparisons possible. Finally, there have been a limited number of studies comparing analysts from different countries. Pike et al. (1993) compare the appraisal of equities by UK and German analysts. Moyes, Park, Wang and Williams (1997) compare US analysts to those of an emerging economy, Taiwan. Studies comparing financial analysts in different global settings are needed to determine the relative reliability of information provided by these analysts.

Acknowledgments

We thank IBES who provided us with the names of the UK analysts to whom the questionnaire was sent. In addition, we thank an anonymous reviewer for helpful comments and suggestions as well as John Chow and John Dixon who assisted with the data input. Finally, we are grateful to Fordham University for its initial funding of this project.

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Pergamon

The International Journal of Accounting
36 (2001) 65–90

The
International
Journal of
Accounting

Improving activities and decreasing costs of logistics in hospitals A comparison of U.S. and French hospitals

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Abstract

This paper investigates logistic (or supply-chain management) differences between large hospitals in the U.S. and France. Given that logistics and supply-chain management have been considered important aspects in hospital management, this paper explores the possible reasons for differences among hospitals in the U.S. and France. The differences are drawn from variables, such as (1) the extent of responsibility given to the logistics department with respect to items, such as purchasing, physical supplying, receiving, inventory management, internal distribution to medical departments, and management information systems; (2) the manner of distribution of supplies (such as central warehouse vs. direct vendor distribution); (3) the amount or the volume of medicine distributed; (4) the degree of partnerships between the hospitals and their vendors and other hospitals; and (5) the past efforts of logistics departments in improving the supply-chain management and future plans for improving the logistic functions. The results provide evidence that U.S. hospitals have been able to reduce the supplies inventory level to a larger extent than their counterparts in France; the French hospitals, however, have a higher level of intention to do so. Both groups support current and future partnerships with other hospitals and suppliers of goods and services. The ability of logistic management to reduce costs associated with medical supplies signals that supplies inventory reduction is possible in even very critical industries (such as medicine). Consequently, the results of this study are relevant to the management of hospitals (and companies), which intend to improve their logistic functions and accounting information systems to decrease the costs associated with inventory. In this paper, we have advocated that Just-in-Time (JIT) philosophy to be applied to hospitals in inventory cost reduction. Contemporary management methods continue to emerge and the healthcare industry needs to continue incorporating these new developments in its operations so

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it can compete in a market that is more competitive than ever. © 2001 University of Illinois. All rights reserved.

Keywords: Hospital supply management in France and the U.S.; Hospital logistics; Just-in-Time; Activity-based management for healthcare providers; Hospital cost reduction; Hospitals partnerships with medical suppliers; Hospital partnerships with other hospitals

1. Introduction

Costing of services provided by the healthcare industry has become more significant in current years. Most U.S. hospitals used to maximize the reported costs to increase revenue (revenue was cost based). The current movement in revenue reimbursement, however, is away from cost-based numbers, and hospitals have become more involved in cost reduction to improve profitability (Orloff, Littell, Clune, Klingman, & Preston, 1990). Although this new movement in revenue reimbursement has been subject of dissatisfaction and complaint (e.g., DeBakey, 1998; Waite, 1998), there is no disagreement on the need for reducing cost by improving process and eliminating unneeded activities.¹

As a result, we have observed that cost accounting in hospitals has improved. New costing methods that provide both better costing information and also possible savings opportunities have been implemented (e.g., Carr, 1993). To continue reducing costs, hospitals need to review their activities, find the costs associated with the activities, classify the activities as value- and nonvalue-added, reduce the cost of all activities, and decrease or eliminate nonvalue-added activities.

The logistics department is a vital part of a hospital because this department may have responsibilities (activities) for purchasing, receiving, inventory management, management information systems, telemedicine, food services, transportation, and home care services. Consequently, it is important to examine the functions (activities) of this department to improve services and cut costs.

The objective of this paper is to provide insight into the logistic functions of hospitals in two different countries and how these hospitals have improved and/or intend to improve their logistic activities and decrease costs. We chose the U.S. and France for our study. The U.S. and France have different social and economic systems and, as we will describe, different healthcare and hospital systems. A priori, we expected that U.S. hospitals, being financed by private sources in most cases, used more cost-effective management information systems, while French hospitals, having a socialist economic background and mostly public sources for financing, used less advanced management (and accounting) information systems. Stated differently, we expected that because of differences in management and accounting information systems and the environment, the U.S. hospitals are more efficient in logistics than their French counterparts.

¹ For example, President of Jamaica Hospital in Queens in New York suggested that "... It was only through creative and risk-taking strategies that the hospital came-out ahead." (mentioned in Lagnado, 1999).

In Section 2, we discuss contemporary activity and costing issues that are relevant to the healthcare industry, especially cost reduction of medical inventory via logistics. Section 3 provides a comparison of the healthcare industry in the U.S. and France as we develop expectations for the results of our survey. In Section 4, we report the results of the survey and compare inventory management in the two countries. This comparison also provides some insights into how managers in the two environments approach the responsibility of the logistics departments and how they intend to improve the services of these departments and reduce the associated costs. This research concludes with our summary and conclusions.

2. Contemporary cost accounting issues

Among contemporary cost management issues, two aspects are most relevant to the healthcare industry: activity-based management (ABM) and inventory management [e.g., Just-in-Time (JIT)].² ABM is a system-wide approach that considers the activities of the organization with the intention of improving the efficiency of activities and reducing (or eliminating) nonvalue-added activities. Inventory management, part of an organization's total activities, has represented considerable savings opportunities in many industries. For example, Eaton was able to improve its production and reduce its financial difficulties during the 1980s by implementing a demand-pull, JIT inventory system (Houston, 1992).

As mentioned previously, an ABM system should distinguish between value-added and nonvalue-added activities. The distinction is necessary so that management can focus on reducing and eventually eliminating nonvalue-added activities and their related costs. Highlighting nonvalue-added activities also reveals the magnitude of the waste the organization is experiencing. Reporting nonvalue-added activities and their costs separately encourages managers to place more emphasis on controlling these types of activities. Furthermore, tracking these costs over time permits managers to assess the effectiveness of their activity-management programs. One possible way to reduce the cost of nonvalue-added activities in hospitals (as well as other organizations) is to develop partnerships³ with other entities that use or provide those activities. For example, to reduce the cost associated with inventory, organizations can develop long-term partnerships with suppliers. Or, to reduce the cost associated with services, such as food preparation and laundry, hospitals may choose to develop long-term partnerships with other hospitals. This way, the hospital may reduce costs by using the economies of scale and/or obtaining new resources (such as staff and technology) through partnerships.

² While JIT can be considered part of ABM, we chose to present it as a separate item to emphasize the importance of this issue.

³ The term "partnership" is used to represent strategic alliances between the organization and others in a cost-savings effort. Partnerships can be developed both horizontally (e.g., laundry, food service, and warehouse sharing) and vertically (e.g., JIT and EDI programs). The ability to share quality management, input, and outcome data with other organizations is critical as healthcare organizations continue to evolve (Gagen & Holsclaw, 1995).

2.1. *Just-in-Time*

Among the nonvalue-added activities are procurement and storing and inventory management. These activities are considered nonvalue-added since they do not add any positive value to services provided by the healthcare organization. A JIT delivery system can help to reduce these nonvalue-added activities. The objective of JIT is to minimize inventory (medical supplies) to levels that satisfy customer demand. A key element of JIT is choosing the suppliers very carefully so the organization can expect a fast (and high quality) delivery of supplies when they are needed. JIT purchasing requires that suppliers deliver materials just in time to be used. Thus, supplier linkages are vital (Hansen & Mowen, 1997). In a JIT environment, the number of suppliers is limited and the purchase contracts are long-term. With a long-term contract, the supplier's uncertainty as to demand is reduced, and the mutual confidence between supplier and purchaser can increase.

Management of medical supplies is one of the most important managerial aspects of the healthcare industry. Inventory management in most industries has improved (e.g., Baker, Fry, & Karwan, 1996), and the level of inventory has been reduced by implementing methods, such as JIT. Nevertheless, some healthcare organizations still hesitate to reduce the level of inventory because the costs of lack of inventory (such as loss of lives) are much higher than the costs of keeping additional inventory. However, current trends and market pressure on the healthcare industry are making healthcare providers seek ways to reduce operating costs. Reducing the cost of carrying medical inventory is such an item.

2.2. *The current view of medical supplies*

Three models of drug distribution are found in practice.⁴

2.2.1. *Model 1: traditional method — delivery to medical departments via a central warehouse*

In the traditional method, a standard stock of frequently prescribed drugs is available on a ward. Medications not available in ward stock are requested from the central distribution source (sometimes called a pharmacy). This model represents a system in which large amounts of inventory are kept and the hospital incurs material inventory costs.

2.2.2. *Model 2: semidirect delivery via medical department warehouses*

In this model, the supplier provides the necessary supplies to a medical department directly. The medical department recognizes the need and contacts the suppliers. This method reduces the level of inventory for two reasons. First, the amount of inventory kept in the departments is normally lower than that in the central distributor, and second, it is less time consuming for medicine to be delivered directly to the medical department without the intervention of the central warehouse.

⁴ Based on an interview with Queens' Medical Center in Hawaii and Bommel and Musen (1997).

2.2.3. Model 3: direct delivery via daily replenishment of small medical department storage facilities

In this model, the supplier has a very close relationship with the hospital and takes over the task of identifying medical needs and filling the supplies. A representative of the supplier reviews the needs on a daily basis and makes the necessary arrangements (such as placing the order and verifying delivery of the medicine). This method is the closest to JIT. The supplier must keep an appropriate type and ample amount of inventory since the hospital keeps the minimum amount within its system.

As mentioned in Section 1, the primary objective of this paper is to provide insights into logistic functions of hospitals in two countries. Furthermore, we intend to find how hospitals have improved and/or intend to improve their logistic activities and decrease costs. Section 3 provides a comparison of healthcare systems in the U.S. and France, followed by the results obtained from our recent survey.

3. International comparison: French and U.S. healthcare industry

Three main factors differentiate the healthcare environment in the U.S. and France. These factors, in turn, may set different priorities for healthcare providers in these two countries. We have defined these main differences as the cost of the service, how the service is funded, and innovations in healthcare delivery and finance. A brief discussion of each of these aspects is provided here.

3.1. The cost of the service

There is no doubt that healthcare expenditures have increased more rapidly in the U.S. than in other countries, so much more that the U.S. has become one of the most expensive healthcare providers in the industrialized world. Fig. 1 provides a comparison of the total expenditure on health per capita based on Purchasing Power Parities (\$PPP) for several countries including France and the U.S. As shown in Fig. 1, the U.S. cost per capita is the highest among the countries included.⁵ In addition, only 45% of the U.S. population carried publicly funded healthcare coverage, while this number was 99.5% for the French population in 1995 (OECD Statistics, 1995).⁶ The cost of this public coverage in the U.S. is 6.3% of US's Gross Domestic Product. This cost is 7.3% of French Gross Domestic Product in France. To determine whether the difference in cost between the countries resulted from the degree of services provided, we compared the number of practicing physicians per 1000 population, inpatient care beds per 1000 population, and inpatient care average length of stay (days) for the two countries in 1996. The results indicate that the French have more practicing

⁵ The OECD statistics suggest that in 1996 the total expenditure on health care per capita in \$PPP is about US\$2000 in France, while it is about US\$3900 in the U.S. (Printed in the OECD Statistics, published in 1998).

⁶ Despite the prosperity of the U.S. economy, the uninsured population increased 4% from 1996 to 1997 (Newcomer, 1999).

The Association Between Health Spending and income per Capita, 1996

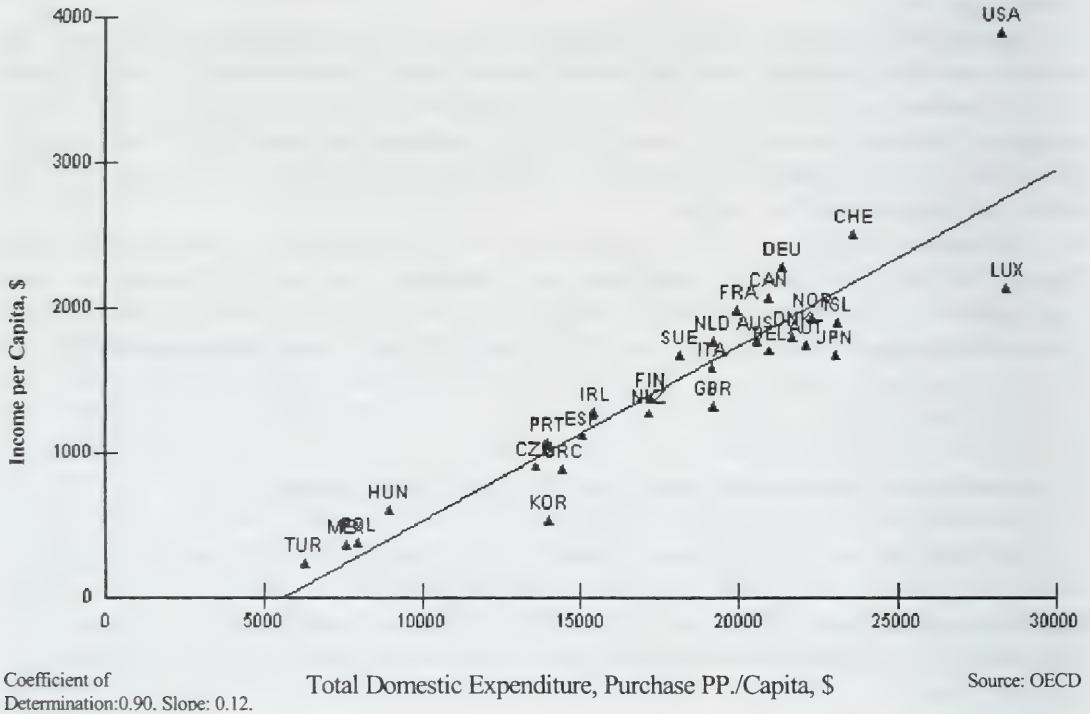


Fig. 1. Note: AUS = Australia, AUT = Austria, BEL = Belgium, CAN = Canada, CZ = Czech Republic, DNK = Denmark, FIN = Finland, FRA = France, GER = Germany, GRC = Greece, HUN = Hungary, IRL = Ireland, ITA = Italy, JAP = Japan, KOR = Korea, LUX = Luxembourg, MEX = Mexico, NLD = Netherlands, NEZ = New Zealand, NOR = Norway, PRT = Portugal, SUE = Sweden, GBR = United Kingdom, US = United States, TUR = Turkey.

physicians (2.9 vs. 2.6 per 1000 population), more inpatient care beds (8.7 vs. 4 per 1000 population), and a longer inpatient care average length of stay (11.2 vs. 7.8 days).⁷(OECD Statistics, 1998).

3.2. How the service is funded

The sources of funding for healthcare services are also different in the U.S. and France. The OECD statistics show that since 1960, the French government has spent more on healthcare than its U.S. counterpart. For example, of all expenditures on healthcare, the French government financed 63% in 1980, 75% in 1995, and about 80% in 1996. The public share of healthcare expenditures for the U.S. was 62% in 1980, 46% in 1995, and 47% in 1996. In France, the *département*, which is the second level of the local

⁷ OECD Statistics, 1998.

government, has authority over social assistance for the elderly and other service recipients of healthcare. However, in the U.S., the administrative arrangements are made at multiple levels of state and local government along with the federal government. Given these facts and that different parties (such as federal and local governments, the private sector, and citizens) finance the cost of healthcare, significant variations in healthcare services exist across states and local governments. Stated differently, healthcare services are not as extensively and/or evenly distributed among the users of these services in the U.S. as they are in France.

Different sources of funding may impose different market pressures. For example, a hospital may sense no market pressure if its functions are entirely funded by public funds regardless of level of service provided. Furthermore, market pressure is reduced when patients are limited to services provided by only a few healthcare providers. For example, West (1998) suggests that Veterans Administration hospitals in the U.S. have very low market pressure, as they remain isolated from market forces. These hospitals do not share the urgency necessary to trigger important operational (and cost saving) changes (West, 1998). In the context of this study, we expected that French hospitals have lower market pressure than do their U.S. counterparts and have less incentive for their logistics departments to take cost-saving measures.

3.3. Innovations in healthcare delivery and finance

Innovations in the delivery and finance of healthcare in the U.S. have been reshaping the healthcare system. Such innovations include the rise of managed care policies, the move away from fee-for-service reimbursement to capitation reimbursement, and the move toward increasing outpatient services relative to inpatient services (Parsons, Woller, Neubauer, Rothamel, & Zelle, 1998). However, these innovations have not been deemed as necessary in France⁸ and have not been implemented as they have in the U.S. As a result, the way that the French hospitals are reimbursed is different from most of their counterparts in the U.S. The French government directly or indirectly reimburses all hospitals, although about half of the French hospitals (about 2000) are private.⁹ Hospitals in the U.S. receive only a portion of their fees through the government (see statistics provided in earlier parts of this section). This situation may contribute to the urgency felt by the U.S. hospitals to improve and/or develop their logistics departments to accommodate the changes and/or the cost savings that became necessary as a result of the changes. A priori, we expect to find that the logistic functions in U.S. hospitals are more efficient than those in French hospitals. In Section 4, the information regarding the sample and the results of the survey are provided.

⁸ OECD 1990's statistics indicate that only 10% of U.S. population were satisfied with the U.S. healthcare system, whereas over 40% of the French indicated they were satisfied with their healthcare system. Over 29% of the U.S. public (vs. 10% in France) indicated that the healthcare system must be completely rebuilt (Jee & Or, 1999).

⁹ This is not to say that the French hospitals do not have incentives to reduce costs; the existence of the private hospitals and the availability of choice between the hospitals result in competition, which in turn should result in actions that produce cost reductions.

4. Survey sample and results

4.1. Sample

The sample hospitals were from two countries: the U.S. and France. We sent surveys to 600 hospitals located in California (the list was obtained from the American Hospital Association Annual Directory). We used California since it contains one of the largest number of hospitals in the U.S., and colleagues considered California as one of the most advanced locations in North America in providing healthcare services. Our expectation was to find current advances in hospital logistics in California hospitals. The number of French hospitals that received our survey questionnaire was 2000. These hospitals were chosen from the Health and Social Affairs Ministry databases. Tables 1 and 2 provide descriptive information of the sample organizations compared to their home country's overall population of hospitals. Notice that U.S. sample hospitals resemble the U.S. general population; however, in France, the sample is skewed toward larger hospitals.

We received 75 responses (12.5% response rate) from the U.S. hospitals and 126 (6.3% response rate) from the French hospitals.¹⁰ While we have enough observations to make statistical inferences, the generalization of the results must be done cautiously. For example, there is an overrepresentation of the public sector in French hospitals, which may bias the results for the French hospital sample, since the public sector hospitals may not have as much incentive to control costs as private hospitals may have.¹¹

4.2. Results

In this part, the survey results for each country are reported separately, and a comparison of the important issues is provided at the end. A copy of the survey questionnaire is provided in Appendix A. As can be observed, most questions are related to four topics:

1. How medical supplies activities are currently handled (e.g., Questions 2 and 3).
2. How the management of medical supplies has improved during the last 3 years (e.g., Questions 7 and 8).
3. If any strategic alliances exist (or existed) with other hospitals to reduce the costs of medical supplies (e.g., Questions 10, 11, 12, 13, 14, and 17).
4. If the hospital is planning to implement additional contemporary management systems in the near future (e.g., Question 16).

4.2.1. U.S. results

The number of respondents for the U.S. sample was 75 hospitals (12.5%). The average number of beds in these hospitals is 250. Most of the respondents were either material managers

¹⁰ As of 9/1/98.

¹¹ Similar to any other industries, private hospitals should be more concerned with their profitability than the public hospitals.

Table 1
The size of sample hospitals in the U.S. and France

Number of beds	6–24	25–49	50–99	100–199	200–299	300–399	400–499	500+	Total
U.S. sample	2	7	12	19	19	7	7	3	75
French sample	0	4	21	30	22	8	8	33	126

(79%) or purchasing managers (15%).¹² In most cases (71%), a specific department was in charge of logistics. The number of cases increases (to 98.6%) when we consider “material management department” as a substitute for “logistics department.” Put differently, the vast majority of Californian (U.S.) hospitals have created a separate department to deal with their logistic needs. The logistic jurisdiction, however, is not the same in all hospitals. For example, the food service function is not part of the logistics department in 86% of the cases.

4.2.1.1. How (medical) supplies activities are currently handled. The logistic process for medical supplies for the respondents takes two forms. Either “Delivery to medical departments via a central warehouse” or “Semidirect delivery via medical department warehouse.” There is no indication that one method is preferred over another and some of the respondents mentioned that both methods have been used in their hospitals. Only in rare instances (in eight cases and only for a part of their medical supplies) did the respondents mention that the suppliers directly delivered inventory when needed. This system is the closest system to stockless inventory and JIT.¹³

With regard to food services, most hospitals provide this service internally. Some suggest that they can control the quality of food and avoid possible negative effects on the institution this way. When food services are provided externally, the logistics departments become very concerned with the quality and efficiency of food suppliers (requiring supplier certification, for example).

4.2.1.2. How the management of medical supplies has improved during the last 3 years. While they mention the need to further improve their current level of partnership (80%), they also provide information that shows improvement in their relationships with suppliers during the last 3 years. For example, 85% say that the level of medical supplies inventory and 69% say that the number of suppliers have been considerably reduced in the past 3 years.

Reasons mentioned for this improvement are implementing Electronic Data Interchange (EDI; 48% of respondents) and setting up JIT programs (26% of respondents). On average, the respondents indicated that they have saved over US\$350,000 (about 36% of total inventory) in the amount of inventory held in the hospitals (the average amount of medical supplies inventory was about US\$1 million). Still, they found that the current savings could be increased.

Some hospitals keep “unofficial stock” in substantial quantities. We were unable to collect the dollar value of this “unofficial stock” category, but it is mostly held in medical departments.

¹² The survey was sent to the attention of “material” or “purchasing” managers.

¹³ We did not find a significant correlation between the size and the method of medical supplies delivery. It is possible that geographic position of hospitals and their suppliers played a role in the method used by hospitals.

Table 2

Part 1: The size of the U.S. sample hospitals compared to the general hospital population in the U.S.

Number of beds	6–24	25–49	50–99	100–199	200–299	300–399	400–499	500+	Total
Population (%)	4	11	26	26	14	9	5	5	100
Sample (%)	3	10	16	25	25	9	9	4	100

Part 2: The size of the French sample hospitals compared to the general hospital population in France

Size	Very large hospitals	Large hospitals	Small hospitals	Private hospitals
Population (%)	1.5	28.1	15.9	54.5
Sample (%)	7.2	41.6	20.0	31.2

Note: We were unable to find similar groupings of U.S. and French hospitals.

On average, 52% of total medical supplies are held in medical departments. Some respondents suggest that they underestimate the value of the inventory to avoid unwanted attention to their level of inventory. As mentioned previously, the average level of stock is about US\$1 million or US\$4000 per bed for a hospital that has an average of 250 beds.¹⁴

4.2.1.3. If any strategic alliances exist (or existed) with other hospitals to reduce the costs of medical supplies. The respondents suggest that they have less than 25% partnership with other hospitals. Any current partnerships are deemed weak and are concentrated in the purchasing, medical personnel, and medical departments (in order of level of partnership). One possible aspect for future improvement for the U.S. hospitals could be to improve their strategic alliances with other hospitals.

4.2.1.4. If the hospital is planning to implement more contemporary management systems in the near future. Logistics and material managers agree that the degree of partnership should increase within the next 3 years. According to their responses, the partnerships should develop (in order of importance) in EDI, purchasing, supplier certification, medical staffs and departments, JIT programs, and stockless programs.

Over 90% of the respondents agree that they need to reduce the number of suppliers, which requires further improvement in the relationships with the suppliers. Sharing food services and laundry functions with other hospitals (typically subcontracted to outside parties) was not reported among anticipated changes.

4.2.1.5. Further analysis. To find the correlation among respondents' answers, we generated Pearson correlation coefficients and found that some of the answers to questions concerning future partnerships with hospitals and or suppliers are statistically correlated. Table 3 provides the related information for those variables that show significant correlation with others.

¹⁴ Notice that the cost of necessary capital for the medical supplies per bed would be about US\$400 per year (10% interest rate is assumed).

Table 3
 Pearson correlation coefficients for significant variables on expected “future partnership” between the hospital and other parties involved in using and/or providing the reported items for the U.S. hospitals

Variable 1	Variable 2	Pearson coefficient	<i>n</i>	Significance degree
Medical staff	EDI	.5068	49	.000
Medical staff	Supplier certification	.3551	41	.023
Stockless management	JIT programs	.4513	69	.000
Purchasing	Medical staff	.4304	55	.001
Purchasing	Laundry sharing	.3875	60	.002
Purchasing	Food services sharing	.3852	59	.003
Purchasing	Medical departments	.3769	56	.004
Medical departments	Supplier certification	.3567	43	.019
Food services sharing	Supplier certification	.3488	45	.019
Medical service	JIT programs	.3158	54	.020

Question 16 mentioned the following partnership possibilities: Medical Departments, Medical staff, Telemedicine, Purchasing, Laundry sharing, Food services sharing, Warehouse sharing, JIT programs, Stockless programs, EDI, and Supplier certification.

Three partnership variables are significantly correlated with others: “Medical staff,” “Purchasing,” and “Supplier certification.” Most of the significant relationships could be expected. For example, “Medical staff” and “EDI” are significantly correlated, suggesting that hospitals that implement EDI have already established collaboration with “Medical staff.” Otherwise, they cannot apply EDI. Put differently, these two variables are affected by the same underlying issue: the need for collaboration with other hospitals have already been recognized and established. Implementation of EDI also contributes to further development in partnerships in the Medical staff. Partnership in “Purchasing” must affect other types of partnerships (such as Medical staff, Laundry, and Food services) since each one of these partnerships is involved in purchasing of services and goods. As Table 3 indicates, those hospitals that want to develop partnerships in “Purchasing,” intend to develop partnerships in the medical fields, such as “Medical departments,” and “Medical staff.” The significant association between the “stockless programs” and “JIT programs” is another example. The management must accept the idea of stockless programs to be able to implement JIT programs. The implementation of JIT programs implies reshaping of procedures and a reorganization of the logistic process.

Information in Table 3 suggests that in general, hospitals have found that partnership will improve their activities and will reduce costs. As a result, they are planning to improve partnerships with both suppliers and other hospitals. Among the variables that hospitals considered as determinants for partnership are “Supplier certification” and a well-developed information system, such as “EDI.”¹⁵

4.2.2. French results

The number of respondents for the French sample was 126 hospitals (representing a 6.3% response rate). The average number of beds in these hospitals is 443. Consequently, compared to the U.S. hospitals (the average number of beds for U.S. respondents was 250 beds), French

¹⁵ Table 5 provides a summary of survey results for the U.S. and France.

respondents represented larger hospitals. Over 50% of the responses were provided by “services économiques” managers or directors. This “service” combines all the activities linked to infrastructure, purchasing, and supplying. It is therefore logical that this “service” could be considered part of the logistics department. Only 31.4% of respondents mentioned a specific department for logistics. They ranked the function of the logistics department (in order of priority) food and laundry services, supply of medical needs, reception, stock management, purchasing, service distribution, and transportation. About 59% of respondents included maintenance and 50% included information systems management as part of the logistics department.

4.2.2.1. How (medical) supplies activities are currently handled. The logistic process for medical supplies in France takes two forms. The majority of hospitals follow the “Delivery to medical departments via a central warehouse” system. Respondents of 73 (58%) hospitals mentioned that they used this method very extensively. Some of the respondents (31 cases or 25%) also mentioned direct delivery of medical supplies to medical departments for small portions (less than 25%) of their inventory. It is possible that managers of the medical department would like to have control of specific medical inventory items, and for this reason, some of the inventories are delivered directly to these departments. Evaluating the responses, one can conclude that while the inventory reduction possibilities have become more and more known by French hospitals, they are not used and/or developed as much as they are in California (semidirect delivery via medical department warehouse is not as widely used in France as it is in the U.S.).

With regard to food services, most hospitals provide this service internally. This way, they can control the quality of food and avoid a possible negative image of the institution. Thus, the logistics departments have become very concerned with the quality and efficiency of food suppliers (requiring supplier certification, for example).

4.2.2.2. How the management of medical supplies has improved during the last 3 years. One of the findings is that in 79.1% of the cases, the respondents mentioned that they have been improving the logistic function by improving relationships with suppliers. They (67.2%) also mention that creation of new partnerships would improve their logistics. As a result of these initiations, within the last 3 years, medical stocks have been reduced in 45.5% of cases. JIT programs and supplier certification programs have been implemented in 44.7% of cases; however, they have not resulted in material savings. In 40.5% of the cases, the supplies level has remained almost constant. The respondents’ answers also indicate that the number of suppliers did not materially change during the past 3 years. The average stock is 14,239,244 Francs (about US\$2,478,100) in each hospital or 32,855 Francs (about US\$5720) per bed. The inventory, as stated previously, is held mainly in warehouses and distribution centers. About 30% of medical inventory, on average, are stored in the medical departments.¹⁶

Telemedicine is widespread only in large hospitals (about 11.7% of total respondents who are also larger hospitals).

¹⁶ No significant relationship between the size of the hospital and the amount of medical inventory was found.

Table 4
 Pearson correlation coefficients for significant variables on expected “future partnership” between the hospital and other parties involved in using and/or providing the reported items for French hospitals

Variable 1	Variable 2	Pearson coefficient	<i>n</i>	Significance degree
Medical staff	Supplier certification	–.2496	92	.016
Medical staff	Laundry sharing	.2248	108	.019
Stockless management	Supplier certification	.2888	90	.006
Stockless management	JIT programs	.2815	97	.005
Purchasing	Medical staff	.2647	110	.005
Purchasing	Medical departments	.3261	116	.000
Purchasing	Laundry sharing	.2200	99	.029

Question 16 mentioned the following partnership possibilities: Medical Departments, Medical staff, Telemedicine, Purchasing, Laundry sharing, Food services sharing, Warehouse sharing, JIT programs, Stockless programs, EDI, and Supplier certification.

4.2.2.3. If any strategic alliances exist (or existed) with other hospitals to reduce the costs of medical supplies. The only departments that have alliances among or between hospitals are purchasing and laundry (about 50% of respondents mentioned these partnerships). Partnership in medical departments and medical personnel is almost nonexistent.¹⁷ Some hospitals subcontract the laundry service, food service, and transportation.

4.2.2.4. If the hospital is planning to implement more contemporary management systems in the near future. About 73% of respondents are considering improving their logistic and medical functions through initiating/extending partnership projects in the near future. Partnership priorities are purchasing, medical staff, medical departments, supplier certification, EDI, and telemedicine. Interestingly, EDI and telemedicine, which seem to be the most important issues for the development of partnerships, are mentioned last. It is possible that the lack of prior partnership experience has contributed to the low ranking of EDI and Telemedicine. While 47.8% of respondents favor reducing the number of suppliers, in general, they do not find the reduction in number of suppliers as a measure of future cost savings. However, medical stock reduction is mentioned as a priority for a vast majority of hospitals.

4.2.2.5. Further analysis. As with the U.S. sample, we ran Pearson correlation coefficients analysis and found that some of the answers to “future partnerships” are statistically correlated. Table 4 provides the details for those variables that show significant correlation with others.

Again, most of these significant relationships could be expected. For example, “Stockless management,” “Supplier certification,” and “JIT programs” are all related to savings resulting from reducing total inventory. Stockless management is not possible if JIT is not implemented and if suppliers do not have total quality supplies (as measured by the supplier’s

¹⁷ Please note footnote 18 also.

Table 5
Summary of survey results for the U.S. and France

Questions/ country	How medical supplies activities are currently handled	How the management of medical supplies has improved during the last 3 years	If any strategic alliances exist (or existed) with other hospitals to reduce the costs of medical supplies	If the hospital is planning to implement additional contemporary management systems in the near future
U.S.	<p>How medical supplies activities are currently handled</p> <p>(A) Medical supplies</p> <ul style="list-style-type: none"> • Delivery to medical departments via a central warehouse. • Semidirect delivery via medical department warehouse. • Only in rare instances, the suppliers directly deliver inventory when needed. <p>(B) Food services</p> <ul style="list-style-type: none"> • Most hospitals provide internally. When provided externally, supplier certification is required. 	<p>How the management of medical supplies has improved during the last 3 years</p> <ul style="list-style-type: none"> • Improved relationships with suppliers. • Reduction in the level of medical supplies inventory (85%). Resulted in an average saving of over US\$350,000 (about 36% of total inventory). • Number of suppliers has been considerably reduced. • Implementing EDI. • Setting up JIT programs in some cases. 	<p>If any strategic alliances exist (or existed) with other hospitals to reduce the costs of medical supplies</p> <ul style="list-style-type: none"> • Less than 25% partnership with other hospitals. • Partnerships are concentrated in the purchasing, medical personnel, and medical departments (in order of level of partnership). 	<p>If the hospital is planning to implement additional contemporary management systems in the near future</p> <ul style="list-style-type: none"> • Increase partnership in EDI, purchasing, supplier certification, medical staffs and departments, JIT programs, and stockless programs. • Reduce the number of suppliers.
France	<p>How medical supplies activities are currently handled</p> <p>(A) Medical supplies</p> <ul style="list-style-type: none"> • Delivery to medical departments via a central warehouse (majority). • Semidirect delivery via medical department warehouse (minority). <p>(B) Food services</p> <ul style="list-style-type: none"> • Most hospitals provide internally. When provided externally, supplier certification is required. 	<p>How the management of medical supplies has improved during the last 3 years</p> <ul style="list-style-type: none"> • Improved relationships with suppliers (79.1%). • Reduction in the level of medical stocks (45.5%). • No reduction in the level of medical supplies (40.5%). • The number of suppliers has not materially changed during the past 3 years. • Telemedicine only in large hospitals. • JIT programs and supplier certification programs have been implemented in 44.7% of cases. 	<p>If any strategic alliances exist (or existed) with other hospitals to reduce the costs of medical supplies</p> <ul style="list-style-type: none"> • Alliances among or between hospitals only in purchasing and laundry (50%). • Some hospitals subcontract the laundry service, food service, and transportation. 	<p>If the hospital is planning to implement additional contemporary management systems in the near future</p> <ul style="list-style-type: none"> • Initiate/extend partnership projects in the near future. Partnership priorities are purchasing, medical staff, medical departments, supplier certification, EDI, and telemedicine. • Reduce the number of suppliers (47.8%), majority of hospitals. • Medical stock reduction is a priority for a vast majority of hospitals.

certification). Similar to their U.S. counterparts, the management of French hospitals must accept the idea of stockless programs to be able to implement JIT programs. The implementation of JIT programs implies reshaping of procedures and a reorganization of the logistic process.

Also, Table 4 indicates that those hospitals that intend to develop partnerships in “Purchasing” also intend to develop partnerships in other areas, such as “Medical departments” and “Medical staff.” Similar to the U.S. sample, French hospitals found that partnerships will improve their activities and will reduce costs. As a result, they are planning to improve partnerships with both suppliers and other hospitals. EDI is not well developed in France, and most respondents did not find it necessary to develop EDI for their hospital functions. There is one unexpected observation in Table 4. While significant, the coefficient of correlation of “Medical staff” and “Supplier certification” is negative, as if those who find partnerships in Medical staff important do not find Supplier certification important or managers do not value supplier certification as much when they have developed medical staff collaboration. It is possible that the lack of prior partnership experience has contributed to the answers provided by the managers or that management perception is that the supplier certification would be developed internally by the collaborative bodies (e.g., word of mouth) and no need will exist for external evaluators for suppliers.¹⁸ Table 5 provides a summary of survey results for the U.S. and France.

4.3. Comparative analysis

4.3.1. The logistic function

As mentioned previously, the logistic departments are present in most of the U.S. sample through the “material management” function. As we expected, logistics departments are less present in France, and its related functions are performed mostly through “services économiques” departments. Table 6 provides the comparative information.

The responsibilities of logistics departments are also different between the two countries. While receiving is considered the most important function of logistics in the U.S., food service is considered the most important function in France.¹⁹ It should be noted that the U.S. logistics departments are more concerned with activities linked to physical flow (receiving, distribution, purchasing, and inventory management), while French logistics departments are mainly responsible for food services and laundry. In both countries, the telemedicine function was considered the least important responsibility of the logistics department. Table 7 reflects this issue.

Another important difference between the two countries is related to how supplies inventory is purchased and distributed. On average, hospitals in California have implemented more developed inventory systems and hence reduced their inventory level more

¹⁸ As one of the reviewers commented, another possibility for the differences in results for partnership observed in France and the U.S. is related to accepted methods of medical practices. While in general, doctors in the U.S. can choose different healthcare organizations to practice, in France, most doctors work within only one healthcare organization. So, the need for partnership is perceived differently between the two countries.

¹⁹ This may have resulted from cultural differences between the two countries.

Table 6

A comparison of questions regarding the existence of logistic function

	There is a logistics department	There is no logistics department
U.S. (%)	98.6	1.4
France (%)	31.4	68.6

than their French counterparts. In response to “*how to improve your distribution system,*” respondents to our questionnaire provided the answers in Table 8. The French respondents have realized the problem of additional medical supplies and want to reduce the level more often than do the U.S. respondents. This behavior is expected, as the U.S. respondents have already reduced their level of supplies inventory to some extent. On average, the amount of medical inventory per bed kept for U.S. hospitals is about US\$4000 (24,000 Francs), whereas this amount is US\$5720 (33,000 Francs) in France. These findings are what we expected when we were comparing the French healthcare environment with that of the U.S.

French respondents, however, continue to believe that a reduction in the number of suppliers is irrelevant to inventory cost savings (in contrast to U.S. respondents). While the respondents in both countries want to improve relationships and partnerships with suppliers, this need is more recognized by the French hospitals. Another noteworthy comparison is related to current (the last 3 years) developments in medical supplies management. As Table 9 shows, both the amount of supplies and the number of suppliers have been reduced more often in the U.S. than in France. As noted in Table 8, even though French hospitals realize the importance of reducing stock and the number of suppliers (in some cases), they are at the beginning of a proactive logistic process.

4.3.2. Strategic alliances

Our survey shows that French respondents realize the need to improve their logistic activity through strategic alliances with their suppliers or other hospitals. French hospitals

Table 7

A comparison of responsibilities given to logistic services in the U.S. and France


Responsibility	U.S.	France
 + (High)	Receiving	Food services
	Internal distribution to medical departments	Laundry
	Purchasing	Physical supplying
	Inventory management	Receiving
	Physical supplying	Inventory management
	Laundry	Purchasing
	Management Information system	Internal distribution to medical departments
	Transportation	Transportation
	Maintenance/environmental services	Maintenance/environmental services
	Home care services	Management Information systems
	Food services	Home care services
	-- (Low)	Telemedicine	Telemedicine

Table 8

A comparison of perceived ways to improve medical supplies distribution system

	U.S.	France	U.S. – France
Stocks must be reduced (%)	47	61	– 14
The number of suppliers must be reduced (%)	63	48	+ 15
Relationships with suppliers should be improved (%)	57	80	– 23
New partnerships should be created with suppliers (%)	49	68	– 19

plan to collaborate with others on purchasing, medical staff and department, supplier certification, and (to a lower degree) EDI. French hospitals have recognized the importance of logistic improvements.

On the other hand, American hospitals (more developed in their logistics) seem to want to reinforce and extend their partnerships in EDI, purchasing, supplier certification, medical departments, JIT programs, medical staff, and stockless programs. The following paragraphs provide a more complete comparison with regard to strategic alliances (partnerships) and the maturity of the logistics departments.

4.4. Aggregated comparison using indices

To make the above comparison more manageable using the available data, we developed three aggregate data items. We labeled these “Maturity of Logistics,” “Current Partnership Index,” and “Anticipated Partnership Index.” We chose the first two data items to measure the current state and possible reasons for the current state (i.e., degree of partnership) of logistics for each respondent.²⁰ The last index provides information on expected future partnerships between the hospital and other parties (e.g., suppliers).

The “Maturity of Logistics” was defined as the total value for the following elements:

Extent of logistic department responsibility. Answers to Question 2 on the questionnaire (that is related to the logistic department responsibility) are aggregated and averaged.²¹

The perception of logistics managers on how to improve distribution systems. Answers to Question 4 on the questionnaire are aggregated and averaged.

The extent of logistics department improvement during the last 3 years by reduction of medical supplies and number of suppliers. Answers to Questions 7 and 8 are aggregated and averaged.

For example, a respondent, who averaged 2.5 in answers to the 12 parts of Question 2, 4 in answers to the four parts of Question 4, and 2 for Questions 7 and 8, is assigned a “Maturity of Logistics” of 8.5.

²⁰ Our method of creating these measures is not free of criticism. First, we are converting the Likert system into a continuous measurement system. Second, we are giving the same weight for answers to each question. Both of these aspects are subject to criticism.

²¹ A copy of the questionnaire is provided in Appendix A of this paper.

Table 9

A comparison of trend in amount of supplies/number of suppliers during the last 3 years

	U.S.	France	U.S.–France
Stocks have been reduced (%)	83	46	+ 37
The number of suppliers has been reduced (%)	68	18	+ 50

The “Partnership Index” was defined as the total value for the following elements:

Medical Collaboration. An aggregate measure of collaboration in medical departments, medical staff, and telemedicine (the first three parts of Question 12).

Collaboration on Infrastructures. An aggregate measure of collaboration in laundry sharing, food services, and warehouse sharing (the last three parts of Question 12).

Logistic Collaboration. An aggregate measure of collaboration in purchasing (part four of Question 12), JIT programs, stockless programs, EDI, and supplier certification (Question 13).

The “Anticipated Partnership Index” was defined in a way very similar to the “Partnership Index.” For this index, however, answers to Question 16 (which are related to the hospital plans for the next 3 years) were used to derive the related values.

Table 10 provides the averages for the above measures for respondents of both the U.S. and French respondents. The U.S. is more mature in logistics and partnership functions. On the other hand, French respondents expect to have a higher degree of partnership in the future.

The most obvious difference between the U.S. and French numbers is related to the extent of logistic department responsibility, 3.34 for the U.S. respondents and 1.43 for the French respondents. This suggests that logistics departments and functions are more centralized in the U.S. Stated differently, the functions are more fragmented in France, and logistics departments barely appear in the organization chart as a separate entity. Another interesting finding in Table 10 is related to values drawn for Question 4 of the questionnaire (logistics managers’ perception of how to improve the distribution system). French respondents are more concerned with improving their distribution system than their U.S. counterparts, possibly because they realize that their levels of inventory should be lower.

Another difference between the U.S. and French respondents is that of collaboration in infrastructures (at both partnership index and anticipated partnership index), which appears more developed in France than in the U.S. One possible explanation could be that the French hospital system is more able to obtain resources necessary for infrastructure investments than the U.S. hospital system. Most of these resources are provided by public funds in France, whereas most of these resources are provided by private funds in the U.S.

Since the information provided in Table 10 is an aggregate measure for all of the respondents, we decided to plot the observed values of “Maturity of Logistics” and current “Partnership Index.” Fig. 2 provides these results. There is a definite positive relationship between the current level of the partnership index and the maturity of the logistics

Table 10

Comparison of the aggregate values for “Maturity of Logistics,” current “Partnership Index,” and “Anticipated Partnership Index” for U.S. and French respondents

	France	U.S.
Extent of logistics department responsibility	1.43	3.34
Logistics managers’ perception of on how to improve distribution system	2.44	2.26
The extent of logistics department improvement	2.06	2.67
<i>Maturity of Logistics</i>	5.93	8.27
Medical Collaboration	1.56	1.72
Collaboration on Infrastructures	1.55	1.26
Logistic Collaboration	2.14	2.43
<i>Partnership Index</i>	5.25	5.40
Medical Collaboration	2.21	1.45
Collaboration on Infrastructures	1.53	1.39
Logistic Collaboration	2.21	1.98
<i>Anticipated Partnership Index</i>	5.95	4.82

Extent of logistic department responsibility. Answers to Question 2 on the questionnaire (that is related to the logistic department responsibility) are aggregated and averaged.

The perception of logistics managers on how to improve distribution systems. Answers to Question 4 on the questionnaire are aggregated and averaged.

The extent of logistics department improvement during the last 3 years by reduction of medical supplies and number of suppliers. Answers to Questions 7 and 8 are aggregated and averaged.

Medical Collaboration for Partnership Index. An aggregate measure of collaboration in medical departments, medical staff, and telemedicine (the first three parts of Question 12).

Collaboration on Infrastructures for Partnership Index. An aggregate measure of collaboration in laundry sharing, food services, and warehouse sharing (the last three parts of Question 12).

Logistic Collaboration for Partnership Index. An aggregate measure of collaboration in purchasing (part four of Question 12), JIT programs, stockless programs, EDI, and supplier certification (Question 13).

Medical Collaboration for Anticipated Partnership Index. An aggregate measure of collaboration in medical departments, medical staff, and telemedicine (Question 16).

Collaboration on Infrastructures for Anticipated Partnership Index. An aggregate measure of collaboration in laundry sharing, food services, and warehouse sharing (Question 16).

Logistic Collaboration for Anticipated Partnership Index. An aggregate measure of collaboration in purchasing, JIT programs, stockless programs, EDI, and supplier certification (Question 16).

department.²² Fig. 2 suggests that only with high levels of mature logistics departments it is possible to develop high levels of partnerships. This suggests that French hospitals need to reevaluate their logistic functions before expanding their partnership programs.

5. Summary and conclusion

Because of the critical role played by the healthcare industry, this industry and its related costs continue to be the center of attention in most industrialized countries. As a result, cost

²² Correlation analysis also indicated a significant positive relationship between the “Maturity of Logistics” and “Partnership Index” at .001 level.

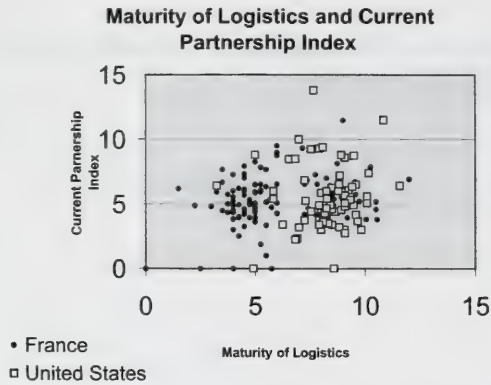


Fig. 2. Plot of Maturity of Logistics and (current) Partnership Index. See notes in Table 10 for definition of Maturity of Logistics and Partnership Index.

control in healthcare has been the subject of many studies, and different methods have been suggested in the literature for reducing the cost of healthcare. We have suggested that the cost could be reduced when activities are closely evaluated and nonvalue-added activities are eliminated or minimized. One of these nonvalue-added activities is related to the cost of carrying inventory, which can be reduced by using the JIT inventory system. Our survey of 201 hospitals in the U.S. and France provides evidence that hospital managers also believe that improvement in the activities of logistics departments (including supplies management) could result in better service and cost reduction.

We found important differences in logistic operations between the U.S. and French samples. For example, there are substantial differences in the degree of collaboration between the hospitals and other organizations (such as other hospitals and suppliers). These collaborations are more in place and viewed more favorably in the U.S. than in France. The results also suggest that hospitals located in the U.S. (California) are more developed in logistics and in the level of partnerships with suppliers. The U.S. hospitals intend to continue their efforts in cost reduction by improving their current and future partnerships and by further inventory reduction. French participants mention the same desires and needs; meanwhile, they show a higher motivation in inventory reduction than their U.S. counterparts. This need has also been strongly acknowledged by French hospitals administrative management.

The survey results confirm the idea that logistics is considered a significant factor for the development of interorganizational collaboration. The logistics department is strengthened by improving or implementing “partnership in medical departments” and “JIT programs,” as well as partnership with suppliers and other hospitals. Indeed, the use of collaboration between healthcare providers seems to be one of the most important ways for saving scarce resources. Management of logistics in the U.S. could be considered *centralized*, since the logistics function is formally written into the organizational chart of hospitals through “materials management.” In France, the logistics functions are more *fragmented*, since they seldom exist as an integrated function and the logistics functions differ from one hospital to another. French hospitals may need to consider redesigning the functions of their logistics

17. In percentage terms, what part of the following your hospital activities are *outsourced*?
A few questions about your hospital:

	0%	1–25%	26–50%	51–75%	76–99%	100%	do not know
Linen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Warehousing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Number of *beds*: _____

19. *Sales* amount (last year): US\$ _____

20. Which of the following describes *your position* most accurately? (Check one category only)

Materials Manager

Logistics Manager

Purchasing Manager

Other: _____

Please place the questionnaire in the enclosed envelope and return it by *March 6, 1998*.
Thank you very much for your cooperation.

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Pergamon

The International Journal of Accounting
36 (2001) 91–113

**The
International
Journal of
Accounting**

An empirical examination of corporate myopic behavior A comparison of Japanese and U.S. companies

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Abstract

The purpose of this study is to examine whether differences in the corporate environments of Japanese and U.S. companies are associated with differences in the extent to which Japanese and U.S. managers engage in corporate myopic behavior. This paper empirically examines the management myopia issue by comparing the level of income smoothing that occurs between U.S. and Japanese companies. A system of simultaneous equations is employed to measure the extent that management uses discretionary accruals and research and development (R&D) investments to smooth income. Our results suggest that while both Japanese and U.S. managers engage in some amount of myopic behavior (i.e., smooth income), Japanese managers do so at a significantly higher level. © 2001 University of Illinois. All rights reserved. Published by Elsevier Science Ltd.

Keywords: Management myopia; Income smoothing; International accounting; Discretionary accruals; Earnings management; Cross-cultural

1. Introduction

During the 1970s and 1980s, many U.S. manufacturing companies received a ‘wake-up’ call from Japanese competitors who were suddenly producing higher quality products at a lower cost. This prompted many researchers to examine how the Japanese achieved such success at the expense of their U.S. competitors. One line of research examines the underlying corporate environment in which these companies operate. An effective corporate

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environment should promote management behavior that improves the value of the firm. The existent literature provides differing views as to which country's corporate environment (Japan or U.S.) better promotes value-maximizing behavior by management. The literature supporting the Japanese corporate environment suggests that the stable shareholders found in Japan are not overly concerned with short-term results and allow management to concentrate on the long-term value of the firm (Darrough, Pourjalali, & Saudagaran, 1998; Jacobson & Aaker, 1993). The same research typically suggests that an active U.S. stock market is overly concerned with short-term results, and influences U.S. managers to engage in myopic behavior.

An alternative view, which has recently received attention in the financial literature, implies that the U.S. corporate environment better promotes value-maximizing behavior by management. This view suggests that the Japanese environment promotes management behavior that is most beneficial to the numerous stakeholders of the firm, even though such behavior may be detrimental to the value of the firm (Kester, 1991). Additionally, the U.S. stock market is viewed as nonmyopic, which implies that it is a positive influence on value-enhancing behavior of U.S. managers (Abarbanell & Bernard, 1995). Given the opposing viewpoints and extant research, the question as to which corporate environment better promotes management behavior that maximizes firm value remains unanswered. In this study, we add to the evidence as to which corporate environment (U.S. or Japan) contributes to management behavior consistent with shareholder wealth maximization. The specific type of behavior examined is income "smoothing" or "earnings management."

We contend that the act of manipulating long-term investment projects [e.g., research and development (R&D)], and to a lesser extent accounting accruals, to achieve targeted current period earnings reflects myopic management behavior. Specifically, this study examines for differences in the level of income smoothing that occurs between a sample of manufacturing companies incorporated in Japan and the U.S. We examine two vehicles used to smooth income: discretionary accruals and R&D investments. These two vehicles coincide with the two levels of earnings management discussed by Schipper (1989). The first level is the act of choosing appropriate accounting methods to reach desired levels of earnings, and the second level involves changing the timing and/or magnitude of strategic decisions to reach desired earnings. Discretionary accruals relate to the less costly level of earnings management (Level 1), and R&D expenditures relate to the more costly level of earnings management (Level 2).

We measure income smoothing by examining for an association between the change in discretionary accruals and the change in R&D investments with the change in prediscretionary accrual and R&D earnings (i.e., core earnings). We select Japanese companies that are listed on the U.S. stock exchanges for our study to ensure both data availability and consistency in accounting rules. These companies are matched with U.S. incorporated companies based on size and industry. Both simultaneous equations and seemingly unrelated regression (SUR) methodologies are employed to examine for differences in the degree to which U.S. and Japanese companies smooth income. The results suggest that while both Japanese and U.S. managers smooth income, Japanese managers do so at a significantly higher level. Additionally, R&D manipulation is the more influential vehicle used to smooth income. These results are consistent with the view that the Japanese corporate environment,

as opposed to the U.S. corporate environment, promotes a greater level of myopic management behavior. Some possible explanations for these results are provided.

In Japan, the market crash of 1990 (i.e., the ‘bubble burst’) had a profound impact on the business community that resulted in many Japanese companies making significant changes on a variety of fronts. For example, several keiretsu member companies have reduced their amount of cross-shareholdings; stock option plans have recently been legalized and implemented in executive compensation plans; the likelihood of lifetime employment has decreased; and hostile takeover threats have begun to surface (Amaha, 1999; Business Week, 1999; Levinson, 1992; Moffet, 1999; Shibata, 1992, 1998; Weinberg, 1997). The bursting of the Japanese bubble, along with the recent changes to the Japanese business environment, suggests that the preexisting environment was less than optimal. This paper focuses on the Japanese business environment prior to the bubble burst, and the results are consistent with the Japanese environment being less effective than the U.S. environment in promoting long-term focused management behavior. Measuring the effectiveness of the recent changes in the Japanese business environment is beyond the scope of this study, and the potential effects of the bubble burst on our results are addressed in a sensitivity test described later in the paper.

The paper is organized as follows. Section 2 provides a brief discussion on some features of the corporate environments that exist in Japan and the U.S. Section 3 provides a discussion of incentives and methods commonly associated with income smoothing. We develop our hypotheses and discuss our sample in Sections 4 and 5, respectively. In Section 6, we provide a discussion relating to the empirical model employed to test our hypotheses. The results are presented in Section 7. Section 8 discusses an additional analysis, while Section 9 concludes our paper.

2. The corporate environments of U.S. and Japan

We expect differences in management behavior to result from differences in the corporate environments that exist in the two countries. Differences in these environments are discussed in this section of the paper.

2.1. U.S.

The large volume of trading on the U.S. stock market is an indication of the level of detail in which investors track companies. For example, 3Com lost US\$7 billion in market value in a matter of weeks after it became known that the firm’s earnings would not meet analysts’ expectations (Fox, 1997). Additionally, IBM’s stock price declined approximately 10% when it was announced that they would not meet their earnings forecast (Jacobson & Aaker, 1993). These examples illustrate the importance placed on accounting information by investors when monitoring the behavior of management. Empirically, a large amount of financial research confirms a statistically significant association between unexpected earnings and residual stock returns (see, for example, Ball & Brown, 1968; Beaver, Clarke, & Wright, 1979; Brown & Kennelly, 1972; Patell, 1976). In summary, an active U.S. stock market

places heavy emphasis on accounting data when monitoring and evaluating companies, and in turn, rational managers are expected to consider the market's desires when disclosing financial information.

The influence that the stock market has on management's horizon when making investment decisions is dependent on their perceived focus of the stock market. One viewpoint suggests that managers perceive the stock market as having a short-term focus and thus are influenced to engage in myopic behavior (i.e., to be overly concerned with short-term financial results; Dertouzos, Lester, & Solow, 1988; Jacobs, 1991; Morita, Reingold, & Shimonura, 1986). Regarding income smoothing, rational managers are expected to appease a myopic stock market by disclosing consistently increasing earnings from period to period. A sharp increase in earnings is undesirable to management because the expected benefits from the current increase do not outweigh the potential costs of experiencing a sharp decrease in future periods. Additionally, a myopic stock market is not expected to penalize the manipulation of long-term investments, which provides management more opportunities to smooth income. Thus, an active, myopic stock market provides management both the opportunity and incentive to smooth income.

An alternative viewpoint suggests that the U.S. stock market has a long-term focus and thus influences management to maintain a long-term horizon when making investment decisions (i.e., to maximize the value of the firm). Abarbanell and Bernard (1995) provide empirical evidence that the U.S. stock market is not myopic, in the sense that it places weight on expected long-run earnings. Additional empirical research provides evidence that market prices reflect long-run earning prospects at least partially (Kothari & Sloan, 1992; Loudder & Behn, 1995; Shevlin, 1991). These results suggest that if U.S. managers perceive the stock market as having a long-term focus, they would engage in behavior reflecting a long-term horizon. With respect to income smoothing, we expect management to have less incentive to smooth income because a nonmyopic stock market is less sensitive to sharp increases or decreases in current period income. Additionally, a nonmyopic stock market would penalize the manipulation of long-term investments (e.g., R&D), which discourages management from smoothing income via these vehicles. Therefore, a nonmyopic stock market both limits the opportunities and lessens the incentives to smooth income.

U.S. managers face additional market pressures other than an active stock market. Fama (1980) describes several market forces that influence management behavior. Two of these forces are (1) the outside managerial labor market and (2) the market for takeovers. An active managerial labor market uses the success of the firm as a criterion to assess the productivity of its management, and also creates an imminent threat of replacement on management. Thus, management behavior is influenced by a fear of replacement along with an incentive to improve their own value status in the managerial labor market. The threat of an outside takeover provides discipline of a last resort. A takeover usually involves a thorough evaluation, and often replacement, of the existing management team. The U.S. exhibits both active managerial labor and takeover markets.¹ These two market forces,

¹ Takeovers of all kinds rose from US\$12 billion in 1975 to around US\$100 billion in 1991 (Charkham, 1994).

along with an active stock market, are believed to significantly influence the behavior of U.S. managers.

Managers improve their position in all three of the aforementioned markets by engaging in actions that increase the market value of the company. Consistent with Fama (1980), management of highly valued firms is positively assessed in the labor market and is less subject to takeover evaluations. The expected behavior of management is dependent on the assumption regarding the perceived focus of the active markets discussed (stock, labor, and takeover). Long-term focused markets promote long-term management behavior, and likewise, short-term focused markets promote short-term management behavior. Therefore, the expected level of income smoothing performed by U.S. managers is dependent on the perceived focus of the markets.

2.2. Japan²

The keiretsu system in Japan results in a corporate environment quite different from the one found in the U.S. The keiretsu are six groups that are comprised of most of the largest corporations in Japan that share common trademarks and are often linked by cross-holdings.³ The keiretsu commonly include a main bank, which acts as the primary lender to the group as well as being an important stockholder with representation on the member firms' boards of directors.⁴ The primary motive for these stockholdings is to solidify a long-term relationship between the main bank and the fellow keiretsu companies.

The motive for cross-holdings among keiretsu members is to solidify relationships, which results in 'stable' shareholdings.⁵ This environment is described by Masaaki Kurokawa of Nomura Research Institute, as follows:

Stable stockholders seek mainly to increase their business transactions and enhance their standings with their invested company. They have little interest in selling the stock for profit ... Japan's 'interlocked' stock system also dissuades takeover bids, as it forces the potential acquirer to negotiate with the 'stable stockholders.' If the shareholders choose to sell, it would mean a renouncement of their agreement, and the termination of their business relationship. (as quoted in Charkham, 1994)

The typical large Japanese firm has many stable shareholders, each owning a significant amount of common stock in an effort to solidify relations. No clear distinctions separating

² In this section, we attempt to describe the Japanese corporate environment that was in place for the majority of our study's time frame (1975–1994).

³ The kind of keiretsu referred to in this paper is the horizontal keiretsu. There are various ways to classify keiretsu, but the two most common are the vertical and horizontal. The vertical keiretsu involves supplier, assembly, and distribution firms. See Miyashita and Russel (1994) for a detailed discussion on the various keiretsu classifications.

⁴ In 1987, Japanese banks and insurance companies owned 42.2% of the shares listed on the Tokyo Stock Exchange (Kang & Shivdasani, 1995).

⁵ Miyashita and Russel (1994) state that only a little more than one-fourth of the outstanding shares of Japanese stock is available for trading after accounting for the direct cross-shareholdings by the keiretsu and institutional shareholdings.

these stable shareholders from one another exist. Rather, it is a coalition of stable shareholders — suppliers, lenders, corporate customers — holding a complex blend of claims against the company (Kester, 1991). For example, the crucial role of the main bank typically involves holding both debt and equity claims in the company. In addition to these stable shareholders, another significant stakeholder group in Japanese companies is its employees. The general rule of lifetime employment results in employees having a significant stake in their companies of employment (Charkham, 1994). Management is left with the complex task of satisfying this coalition. Kester (1991) claims that the one objective that most stakeholders can agree on as having a potential benefit is corporate growth, and thus, growth is considered to be the common denominator among the stakeholder groups. Creditors and employees are two influential stakeholder groups that have a particularly strong interest in growth and stability.

The role of the stable shareholder coalition, often with the main bank as leader, very much depends on the strength of a particular customer (Charkham, 1994). In times of financial distress, the stable shareholder coalition may replace poorly performing managers (Kang & Shivdasani, 1995; Kaplan & Minton, 1994). Thus, to avoid unwanted interference from the coalition of stable shareholders, rational managers are expected to engage in behavior that improves the perceived growth of the firm, which may involve disclosing consistent earnings growth through the years (i.e., income smoothing).

An alternative view suggests that due to the limited amount of information asymmetry between Japanese stakeholders and management, management is able to focus on firm value-enhancing projects and not be overly concerned with short-term financial results (Darrough et al., 1998; Jacobson & Aaker, 1993; Stein, 1989). In comparison, the information asymmetry between shareholders and management in the U.S. causes shareholders to rely heavily on short-term financial results as signals of performance and, in turn, influences managers to act with a short-term focus. This viewpoint is well documented throughout the popular press and suggests that Japanese managers face less pressure, as compared to their U.S. counterparts, to smooth income.

In summary, the minimal stock market influence in Japan leads to an environment that creates a managerial perspective with a main-bank focus, which is quite different than the one created by the U.S. environment. Because of these differing perspectives, we expect management behavior to differ between the countries.

3. Income smoothing

In general, stable earnings improve the confidence of stockholders and creditors toward the value of the firm and its management (Lambert, 1984; Ronen & Sadan, 1981; Trueman & Titman, 1988). The positive benefits associated with this improved confidence (e.g., job security, increased salary, and lower costs of capital) create an inherent incentive for managers to disclose stable earnings (i.e., smooth income). Smoothing income becomes a concern for investors when management manipulates current earnings at the detriment of the long-term value of the firm. The degree of income smoothing performed by management is influenced by their surrounding corporate environment. This study examines the effectiveness of two corporate environments (Japan and U.S.) in positioning management to

better resist the inherent incentive to smooth income at the detriment of the long-term value of the firm.

Income smoothing is a specific type of earnings management. Schipper (1989) discusses two levels of earnings management. On the less costly level, management chooses appropriate accounting methods to reach a desired level of earnings. That is, they subjectively choose accounting accrual estimates to achieve a targeted earnings amount for the period and do not adjust the timing or make up of the strategic decisions of the company.⁶ The more costly level of earnings management occurs when management changes the timing and/or magnitude of strategic decisions. Some examples of the more costly level of earnings management include manipulating the timing or make up of capital expenditures, R&D expenditures, and advertising expenditures. We call the two levels of earnings management discussed by Schipper (1989) as Levels 1 and 2 methods, respectively. This study focuses on discretionary accruals and R&D expenditures, respectively, to examine each of the two levels of earnings management. These two methods were chosen for examination because of data availability and the rich prior literatures on the use of discretionary accruals and R&D for earnings management.

Management must assess the benefits and costs associated with managing earnings when making income-smoothing decisions. We contend that the act of manipulating long-term investment projects (e.g., R&D), and to a lesser extent accounting accruals, to achieve targeted current period earnings reflects myopic management behavior. The costs associated with Level 1 methods were recently discussed by Arthur Levitt, Chairman of Securities and Exchange Commission (SEC), who suggested that managing earnings via accounting methods is eroding the quality of financial reporting, and that corporate managers should remember that “the integrity of the numbers in the financial reporting system is directly related to the long-term interest of a corporation” (Levitt, 1998). Additionally, prior literature suggests that Level 1 methods require at least a limited amount of additional accounting resources (Fudenberg & Tirole, 1995).⁷ Level 2 earnings management methods potentially reduce shareholders’ wealth because the act of manipulating the magnitude and/or timing of strategic investments of the company may have a long-term negative impact on the value of the firm.

Although Level 2 methods are potentially more costly than Level 1 methods, they are arguably more effective in managing earnings. By definition, accounting accruals must

⁶ Management is required to make numerous discretionary accrual type decisions. The Financial Accounting Standards Board discusses this topic in the *Statements of Financial Accounting Topics* as follows: “Those who are unfamiliar with the nature of accounting are often surprised at the large number of choices that accountants are required to make. Yet choices arise at every turn. Decisions must first be made about the nature and definition of assets and liabilities, revenues and expenses, and the criteria by which they are to be recognized. Then a choice must be made of the attribute of assets to be measured — historical cost, current cost, current exit value, net realizable value, or present value of expected cash flows. If costs have to be allocated, either among time periods or among service beneficiaries, methods of allocation must be chosen” (Financial Accounting Standards Board, 1980).

⁷ Fudenberg and Tirole (1995) state that “such costs of earnings management include poor timing of sales, overtime incurred to accelerate shipments, disruption of the suppliers’ and customers’ delivery schedules, time spent to learn the accounting system and tinker with it, or simple distaste for lying.”

reverse in some future period, which restricts management's ability to continuously use accruals to manage earnings in the same direction. For example, if a company experiences successive periods of low premanaged earnings, management would be limited as to the amount of income increasing accruals available throughout the succeeding periods. Additionally, generally accepted accounting principles (GAAP) limit the amount and types of accounting accruals available for management's discretion. Strategic investments, on the other hand, are nonreversing and are not limited in amount by any external rules. For example, management may choose to reduce or increase R&D investments by any achievable amount for a given period. In summary, when deciding upon income-smoothing techniques, management must assess the costs, benefits, and opportunities associated with the different methods of earnings management.

Intuitively, when smoothing income, management would first exhaust the Level 1 methods of earnings management (e.g., discretionary accruals) before resorting to the Level 2 methods (e.g., R&D investments). However, when the Level 1 methods are not available to management, perhaps because of timing of accruals or GAAP restrictions, they must resort to the Level 2 methods in order to achieve desired earnings. Also, the relative impact of the Level 1 methods (e.g., discretionary accruals) is expected to be significantly less than the Level 2 methods in managing earnings. Management may determine that the insignificance of the Level 1 methods renders them inadequate in achieving targeted earnings, and thus employ the Level 2 methods. In summary, we do not have a theory as to which level of methods will be used the most by management when smoothing income.

4. Hypotheses

The expectation of which country's management, Japan or U.S., engages in a greater level of income smoothing is dependent upon which previously discussed viewpoints are assumed. U.S. managers are expected to engage in short-term (long-term) behavior if they perceive the markets (stock, labor, and takeover) to have a short-term (long-term) focus. The expected focus of Japanese management behavior depends on whether the Japanese corporate environment promotes firm growth and stability or if it prioritizes value-enhancing activities. Japanese management desiring to signal growth and stability to the coalition of stakeholders is expected to engage in income-smoothing activities, whereas Japanese management attempting to maximize firm value is expected to be less concerned with smoothing income.

We have no expectation as to which country engages in a higher level of income smoothing. Thus, the following hypotheses (stated in alternative form) are two-sided and correspond to the two levels of earnings management previously discussed:

Hypothesis 1: The degree of income smoothing through the use of discretionary accruals differs between U.S. and Japanese companies.

Hypothesis 2: The degree of income smoothing through the timing and amount of R&D investments differs between U.S. and Japanese companies.

5. Sample

Our measurements of management behavior for U.S. and Japanese companies require reliance on financial statement data presented in annual reports. In order to perform a meaningful comparison between Japanese and U.S. companies, the data used should be derived from comparable sets of accounting rules. All companies listed on U.S. stock exchanges are required by the SEC to either comply with U.S. GAAP or reconcile to U.S. GAAP.⁸ Most Japanese companies listed on U.S. exchanges use U.S. GAAP for their primary consolidated financial statements because at the time they originally listed in the U.S., Japan did not require consolidated financial statements (Amir, Harris, & Venuti, 1993). Once Japan adopted full consolidation, these companies were allowed to retain U.S. GAAP for Japanese reporting purposes. Godwin, Goldberg, and Douthett (1998) provide evidence that U.S. GAAP financial statements of Japanese firms are value relevant beyond that contained in their domestic GAAP statements (i.e., unconsolidated domestic GAAP statements). Regarding our study, the initial sample of Japanese companies follow U.S. GAAP for their primary consolidated financial statements, and based on the aforementioned literature, these statements are value relevant. We assume that the Japanese managers for our sampled companies recognize the emphasis placed on the U.S. GAAP financial statements, and act accordingly. Therefore, it appears reasonable to compare the behavior between Japanese and U.S. managers by examining the primary consolidated financial disclosures (i.e., U.S. GAAP financial statements) from each country's management group.

The initial selection of Japanese incorporated companies listed on U.S. exchanges came from the January 1997 *Compact D/SEC* database. This produced a total of 21 companies. After eliminating nonmanufacturing institutions, the sample totaled 14 companies. One company had to be dropped due to missing data. We matched the remaining 13 firms with U.S. incorporated firms based on industry and size. The matching procedure involved using SIC industry codes and total assets as criteria, in which SIC code was given greater emphasis. This matching procedure resulted in eight sets of companies being matched on four-digit SIC code, three sets of companies being matched on three-digit SIC code, and the remaining two sets of companies being matched on two-digit SIC code. The matched set of companies is listed in Table 1. The panel data consist of 407 firm-year observations covering the period 1975–1994 and were obtained via Compustat and Q-Data SEC files.

In order to ensure that the selected companies incorporated in Japan and listed on U.S. exchanges are predominantly influenced by the Japanese corporate environment, we examined the Form 20-F documents from the Japanese selected firms to determine the percentage of total common stock outstanding found on the U.S. exchanges. The 20-F documents examined are related to fiscal years 1989 through 1992. From these documents, the ratio of common stock outstanding in the U.S. markets to total common stock outstanding

⁸ We examined the Worldscope database via Dow Jones *News/Retrieval* and verified that all of the selected companies comply with U.S. GAAP.

Table 1
Matched sample items

U.S. companies	Primary SIC	Japanese companies	Primary SIC
Varity	3520	Komatsu	3520
Deere & Co.	3523	Kubota	3523
Illinois Tool Works	3545	Makita	3546
International Business Machines	3571	Hitachi	3571
Rockwell International	3625	Sony	3651
Zenith Electronics	3651	NEC	3651
North American Philips	3651	Pioneer Electronic	3651
Motorola	3663	Matsushita Electric Industries	3660
Intel	3674	Kyocera	3660
AMP	3679	TDK	3670
Chrysler	3711	Honda Motor	3711
Eastman Kodak	3861	Canon	3861
Polaroid	3861	Ricoh	3861

was obtained. This information was not available for two of the firms.⁹ For the remaining 11 firms, the mean percentage of common shares outstanding on the U.S. exchanges is 1.236%, with a median of 0.319%. The largest ratio of the 11 companies is 6.47%. From this data, we conclude that the percentage of capital obtained from the U.S. markets is quite small for each of the selected companies, and therefore, despite being listed on U.S. exchanges, these companies are still predominantly influenced by the Japanese corporate environment.

Prior literature examines several other incentives to manage earnings, which may affect our sampled companies. One such incentive results from managerial bonuses (Gaver, Gaver, & Austin, 1995; Healy, 1985). Management compensation structures in the U.S. typically place heavier emphasis on firm stock price when compared to the management compensation structures found in Japan. Stock options represented approximately one-third of U.S. CEO compensation in 1990 and 1991 (Yermack, 1995), whereas stock option plans are not common in Japanese corporations (Aoki, 1988; Kato, 1997). In summary, the differences in the compensation structures between the U.S. and Japanese managers suggest that U.S. managers face a greater stock market influence than their Japanese counterparts, which is consistent with our previous discussion on the corporate environment differences of the two countries.

Other earnings management incentives include: to improve managerial buyout price (DeAngelo, 1986; Perry & Williams, 1994), to avoid political costs (Watts & Zimmerman, 1986), to avoid debt covenant violations (DeFond & Jiambalvo, 1994; Sweeney, 1994), and to cover up financial difficulties (Palmrose, 1987). All of the companies selected are in nonregulated industries, and none were involved in a managerial buyout during the years

⁹ For one of the firms, the amount of common stock registered to issue on the U.S. exchanges was disclosed, but the amount outstanding was not. The other firm did not have a Form 20-F on the Dow Jones *News Retrieval* SEC Full-Text Filings database.

sampled.¹⁰ Thus, we assume that any incentives to manage earnings resulting from managerial buyouts or political costs are minimal for the selected companies. We further assume that any incentives to manage earnings to avoid debt covenant violations or to cover up financial difficulties are also minimal due to our sample consisting of relatively large, well-established companies. Additionally, this study uses a panel data set for analysis, which through the inclusion of firm and year dummy variables inherently controls for firm and year specific effects. In summary, we assume that the effects resulting from the aforementioned alternative incentives to manage earnings are either minimal and are being controlled for by the panel data set, or are consistent with our previous discussion regarding the differences in the countries' corporate environments.

6. Model development

We attempt to measure both levels of earnings management discussed above. First, we compare the timing and amounts of discretionary accruals between the countries to examine a Level 1 method of income smoothing. Second, we compare the magnitude and timing of R&D investments between the two countries to examine a Level 2 method of income smoothing. We rely on methodology developed in prior literature in estimating discretionary accruals of our sampled companies. Specifically, we employ the modified Jones' (1991) model that was found to be the most effective in detecting discretionary accruals of the models used in the prior earnings management literature (Dechow, Sloan, & Sweeney, 1995).¹¹

When determining the amount and means in which net income will be smoothed, management begins with an income amount before the inclusion of discretionary accruals and R&D expenditures. We refer to this amount as core earnings for the remainder of this paper. From this amount, management determines the amount of smoothing necessary to obtain the desired level of reported income. We attempt to capture this behavior by examining for an association between core earnings and the earnings management activity (i.e., discretionary accruals and R&D). In order to focus on the current year behavior of management, we examine the annual changes of these amounts.

To test the hypotheses, we use a simultaneous equations model. Since both methods of earnings management are performed to achieve the same objective, it seems reasonable that

¹⁰ We performed a full-text Wall Street Journal search via the Dow Jones *New/Retrieval* for the companies in our sample using the keywords "management buyout" for the period 1/2/84–12/31/94. This search generated no articles regarding management buyouts for the selected companies.

¹¹ The modified Jones' (1991) model involves the use of the following expectations model to estimate the firm-specific parameters relating to nondiscretionary accruals: $TA_t = a_1(1/A_{t-1}) + a_2(\Delta REV_t - \Delta REC_t) + a_3(PPE_t) + \nu_t$, where ΔREV_t = revenues in year t less revenues in year $t - 1$ scaled by total assets at $t - 1$; ΔREC_t = net receivables in year t less net receivables in year $t - 1$ scaled by total assets at $t - 1$; PPE_t = gross property plant and equipment in year t scaled by total assets at $t - 1$; A_{t-1} = total assets at $t - 1$; ν_t = the residual and is the estimated discretionary accrual amount for year t ; $TA_t = (\Delta CA_t - \Delta CL_t - \Delta Cash_t + \Delta STD_t - Dep_t) / (A_{t-1})$, where ΔCA = change in current assets, ΔCL = change in current liabilities, $\Delta Cash$ = change in cash and cash equivalents, ΔSTD = change in debt included in current liabilities, Dep = depreciation and amortization expense.

the level of one method will simultaneously affect the level of the other method.¹² The following simultaneous model is employed:

$$\begin{aligned} \Delta ACCRUAL = & b_0 + b_1 \Delta R\&D + b_2 \Delta PRENI + b_3 COUNTRY \\ & + b_4 \Delta PRENI * COUNTRY + b_5 LAG_ \Delta ACCRUAL + FIRMXX \\ & + YEARXX + \varepsilon \end{aligned}$$

$$\begin{aligned} \Delta R\&D = & b_0 + b_6 \Delta ACCRUAL + b_7 \Delta PRENI + b_8 COUNTRY \\ & + b_9 \Delta PRENI * COUNTRY + b_{10} LAG_ \Delta R\&D + FIRMXX + YEARXX + \varepsilon \end{aligned}$$

where,

ΔACCRUAL. This variable equals the change in discretionary accruals from the prior year divided by current period net sales.¹³ Discretionary accruals are calculated using the modified Jones' (1991) model.

ΔR&D. This variable equals the change in R&D investment from the prior year divided by current period net sales.

ΔPRENI. This variable is the core earnings amount and equals the prior year change in net income net of R&D expenditure and discretionary accruals divided by current period net sales. Specifically, the calculation of this variable is as follows:

$$\Delta PRENI_t = (PRENI_t - PRENI_{t-1}) / SALES_t$$

where *t* is the current period, *PRENI* is net income net of discretionary accruals and R&D expenditures, and *SALES* is current period net sales. Specifically, *PRENI* is calculated as follows:

$$PRENI = NETINC_t + RD_t - DA_t$$

where *NETINC* is current period net income, *RD* is current period R&D expenditure, and *DA* is current period discretionary accruals.

Regarding the discretionary accrual equation (i.e., where *ΔACCRUAL* is the dependent variable), an increase (decrease) in core earnings from the prior year associated with a

¹² The simultaneous equations approach assumes that discretionary accrual changes and R&D changes behave as if they are endogenous. We test this assumption by performing the Hausman test for endogeneity. After considering eight potential outlier observations, the estimated coefficients from the structural equations on the residuals from the reduced form equations for change in R&D and change in discretionary accruals had *P*-values of .05 and .07, respectively. We conclude that the results from this test suggest that change in R&D and change in discretionary accruals behave as if they are endogenous, and thus, a simultaneous equations approach is appropriate. As a sensitivity test, we employed OLS regressions to test our hypotheses, and the results remain unchanged from those reported.

¹³ We divide by current period net sales in order to control for size effects that were not eliminated from our matching procedure. Larger companies may have greater opportunities to manage earnings than smaller companies due to the amount and number of possible earnings management vehicles. We attempt to control for these effects by scaling the variables by current period net sales. As a sensitivity check, we scaled the variables by total assets, and the results remained unchanged.

decrease (increase) in discretionary accruals from the prior year suggests income smoothing. Therefore, a significant negative coefficient of this variable (b_2) suggests that management uses discretionary accruals to smooth income. Regarding the R&D equation (i.e., where $\Delta R\&D$ is the dependent variable), an increase (decrease) in core earnings from the prior year associated with an increase (decrease) in R&D investment from the prior year suggests income smoothing. Therefore, a significant positive coefficient of this variable (b_7) suggests that management uses R&D expenditures to smooth income.

COUNTRY. A dummy variable used to capture the effects of country origin on the dependent variable. This variable equals 0 if a Japanese company, and 1 if a U.S. company.

$\Delta PRENI * COUNTRY$. An interaction term that is the variable of interest to test our hypotheses. Regarding the discretionary accruals equation, a significant coefficient on this variable (b_4) would indicate that the relationship between $\Delta PRENI$ and $\Delta ACCRUAL$ differs between U.S. and Japanese companies, and would support Hypothesis 1. Regarding the R&D equation, a significant coefficient on this variable (b_9) would indicate that the relationship between $\Delta PRENI$ and $\Delta R\&D$ differs between U.S. and Japanese companies, and would support Hypothesis 2.

LAG $\Delta ACCRUAL$. This variable is a one-period lag of the $\Delta ACCRUAL$ variable. Effective earnings management techniques involve strategically timing the recognition of revenues and expenses in the desirable period. The nature of an accounting accrual is that it must be reversed in some future period. Therefore, we expect this variable to be inversely related to the dependent variable (i.e., the coefficient to be negative).

LAG $\Delta R\&D$. This variable is a one-period lag of the $\Delta R\&D$ variable. R&D investments often require planning over multiyear periods. Therefore, increases (decreases) in R&D investments for a given year may be part of a long-term trend of planned R&D increases (decreases). Thus, we expect this variable's coefficient to be positive.

FIRMXX. Dummy variables to control for specific company effects.

YEARXX. Dummy variables to control for the years 1976–1993.

7. Results

The discretionary accruals for each observation were calculated using the modified Jones' (1991) model, which is described in footnote 11. In estimating the firm-specific expectation model for a given year, a jackknife approach was used. This involved estimating the expectation model for each firm while holding out the year of interest. The estimated model was then used against the year of interest in order to calculate the discretionary accrual. The number of years used to generate the expectation models ranged from 11 to 19.

Table 2 presents the mean and the t statistics comparing the mean between the countries for several variables of interest. The U.S. companies selected have significantly greater R&D and *PRENI* than the selected Japanese companies. This suggests that for our sample, U.S. managers have a greater opportunity to smooth income via R&D investments than their Japanese counterparts. Additionally, based on the *PRENI* variable, our sample of U.S. firms are generally more financially healthy than Japanese firms. However, the Japanese

Table 2

Descriptive statistics: mean values for 13 U.S. and 13 Japanese firms for the period 1976–1994

	Japan (<i>n</i> =191)	U.S. (<i>n</i> =216)	<i>t</i> statistic
$\Delta ACCRUAL$	-.00000074	.0000007	.301
$\Delta R\&D$	.0068	.0049	2.476*
$\Delta PRENI$	.009225	.010432	.301
<i>SALES</i>	12470.74	9847.57	1.768**
<i>ACCRUAL</i>	-.00000145	-.00000046	.299
$|\Delta ACCRUAL|$	.000012	.000021	2.840*
<i>R&D</i>	.0439	.0555	4.388***
<i>PRENI</i>	.08055	.102939	3.658***

$\Delta ACCRUAL$ =change in discretionary accruals from the prior year/net sales; $\Delta R\&D$ =change in R&D expenditures from the prior year/net sales; $\Delta PRENI$ =change in core earnings from the prior year/net sales [$(PRENI_t - PRENI_{t-1})/SALES_t$]; *SALES*=total sales (in millions of dollars); *ACCRUAL*=discretionary accruals in the current year/net sales; $|\Delta ACCRUAL|$ =absolute value of *ACCRUAL*; *R&D*=R&D expenditures in the current year/net sales; *PRENI*=core earnings in the current year/net sales.

* Statistically significant at less than the .05 level.

** Statistically significant at less than the .10 level.

*** Statistically significant at less than the .001 level.

companies' average core earnings is around 8% of sales (0.08055), which suggests that these companies are financially healthy as well.¹⁴ The selected Japanese companies have significantly greater $\Delta R\&D$ than the selected U.S. companies, and suggests that on average, the Japanese companies change R&D from the prior year by a greater amount than their U.S. counterparts. The *SALES* variable is significantly different at the .10 level, which suggests that our matching procedures based on size were imprecise. However, size effects are controlled for in our model by scaling the variables by current period sales. The reversing nature of the *ACCRUAL* variable results in averages close to zero, therefore, the absolute value of this variable is presented ($|\Delta ACCRUAL|$). The large difference between the ratios of *R&D* to core earnings and $|\Delta ACCRUAL|$ to core earnings for both countries indicates that the R&D vehicle provides management with a greater opportunity to manage earnings. Specifically, the ratio of *R&D*/*PRENI* for both countries is slightly over 50% (54.5% for Japan and 53.9% for U.S.), while the ratio of $|\Delta ACCRUAL|/PRENI$ for both countries is close to zero. The remaining variables of interest are not statistically different between the countries at any conventional level.

Table 3 presents the correlation matrix of the variables included in our simultaneous model. Not surprisingly, high correlations exist between the interaction variables and their related individual variable, and the lag variables and the related variable being lagged. The highly positive correlation between $\Delta R\&D$ and $\Delta PRENI$ (.25) suggests R&D investments are being manipulated to smooth income, which is consistent with Hypothesis 2.

We utilize the two-staged least square (2SLS) technique to estimate the simultaneous equations previously stated. Table 4 presents the results of the simultaneous equation model

¹⁴ As a sensitivity test, the models in this study were run using only positive earning years. A total of 38 years had negative earnings, with 35 of these years being from U.S. companies. When these years are excluded from analysis, the results remain relatively unchanged from those stated.

Table 3
Correlation matrix of independent variables

	$\Delta R\&D$	$\Delta PRENI$	$COUNTRY$	$\Delta PRENI^*$ $COUNTRY$	$LAG_{\Delta R\&D}$	$LAG_{\Delta ACCRUAL}$
$\Delta ACCRUAL$	.03	.07	.01	.07	-.05	-.50
$\Delta R\&D$		.25	-.12	.17	.52	-.04
$\Delta PRENI$			.02	.95	.08	-.09
$COUNTRY$				.13	-.10	.04
$\Delta PRENI^*COUNTRY$					.08	-.05
$LAG_{\Delta R\&D}$						-.01

$\Delta ACCRUAL$ =change in discretionary accruals from the prior year/net sales; $\Delta R\&D$ =change in R&D expenditures from the prior year/net sales; $\Delta PRENI$ =change in core earnings from the prior year/net sales; $COUNTRY$ =1 if a U.S. company, 0 if otherwise; $\Delta PRENI^*COUNTRY$ =interaction term of the variables $\Delta PRENI$ and $COUNTRY$; $LAG_{\Delta R\&D}$ =1-year lag of $\Delta R\&D$; $LAG_{\Delta ACCRUAL}$ =1-year lag of $\Delta ACCRUAL$.

for discretionary accruals. $\Delta PRENI$ is in the predicted direction but is not statistically significant at any conventional level. This suggests that managers overall do not use discretionary accruals to smooth net income. The test variable, $\Delta PRENI^*COUNTRY$, is also not statistically significant (P -value=.175), and thus, Hypothesis 1 is not supported.

Table 5 presents the results of the simultaneous equation model for R&D investments. $\Delta PRENI$ is statistically significant (P -value<.001) in the expected direction and suggests that managers overall use R&D investments to smooth net income. The test variable, $\Delta PRENI^*COUNTRY$, is also statistically significant (P -value<.001), and thus, Hypothesis 2 is supported. The negative sign on the coefficient for $\Delta PRENI^*COUNTRY$ suggests that the

Table 4
Simultaneous equations analysis — discretionary accruals

$$\Delta ACCRUAL = b_0 + b_1\Delta R\&D + b_2\Delta PRENI + b_3COUNTRY + b_4\Delta PRENI^*COUNTRY + b_5LAG_{\Delta ACCRUAL} + FIRMXX + YEARXX + \epsilon$$

Variable	Predicted relation	Estimated coefficients	Standard errors	t statistic
$INTERCEPT$	none	-.00001	.00002	-.075
$\Delta R\&D$	none	-.00089	.00078	-1.151
$\Delta PRENI$	-	-.00023	.00025	-.931
$COUNTRY$	none	-.00001	.00002	-.489
$\Delta PRENI^*COUNTRY$	none	.00033	.00024	1.360
$LAG_{\Delta ACCRUAL}$	-	-.43023	.03807	-11.300*
Number of observations	407			
System weighted R^2	.45			

$\Delta ACCRUAL$ =change in discretionary accruals from the prior year/net sales; $\Delta R\&D$ =change in R&D expenditures from the prior year/net sales; $\Delta PRENI$ =change in core earnings from the prior year/net sales; $COUNTRY$ =1 if a U.S. company, 0 if otherwise; $\Delta PRENI^*COUNTRY$ =interaction term of the variables $\Delta PRENI$ and $COUNTRY$; $LAG_{\Delta ACCRUAL}$ =1-year lag of the variable $\Delta ACCRUAL$; $FIRMXX$ =dummy variables to control for each company; $YEARXX$ =dummy variables to control for the years 1976–1993.

* Statistically significant at less than the .001 level based on one-tailed (two-tailed) tests for variables whose relation to the dependent variable is (is not) predicted.

Table 5
Simultaneous equations analysis — R&D

$$\Delta R\&D = b_0 + b_6\Delta ACCRUAL + b_7\Delta PRENI + b_8COUNTRY + b_9\Delta PRENI * COUNTRY + b_{10}LAG_ \Delta R\&D + FIRMXX + YEARXX + \varepsilon$$

Variable	Predicted relation	Estimated coefficients	Standard errors	t statistic
<i>INTERCEPT</i>	none	.00170	.00238	.713
<i>ΔACCRUAL</i>	none	− 10.42413	12.39635	− .841
<i>ΔPRENI</i>	+	.19010	.02959	6.425*
<i>COUNTRY</i>	none	− .00581	.00257	− 2.262**
<i>ΔPRENI * COUNTRY</i>	none	− .16781	.03026	− 5.545**
<i>LAG_ΔR&D</i>	+	.21515	.05887	3.655*
Number of observations	407			
System weighted <i>R</i> ²	.45			

ΔACCRUAL=change in discretionary accruals from the prior year/net sales; *ΔR&D*=change in R&D expenditures from the prior year/net sales; *ΔPRENI*=change in core earnings from the prior year/net sales; *COUNTRY*=1 if a U.S. company, 0 if otherwise; *ΔPRENI * COUNTRY*=interaction term of the variables *ΔPRENI* and *COUNTRY*; *LAG_ΔR&D*=1-year lag of the variable *ΔR&D*; *FIRMXX*=dummy variables to control for each company; *YEARXX*=dummy variables to control for the years 1976–1993.

* Statistically significant at less than the .001 level based on one-tailed (two-tailed) tests for variables whose relation to the dependent variable is (is not) predicted.

** Statistically significant at less than the .05 level based on one-tailed (two-tailed) tests for variables whose relation to the dependent variable is (is not) predicted.

relationship between R&D investments and core earnings is stronger for Japanese than U.S. companies. The estimated coefficient of *ΔPRENI* (0.1901) for Japanese companies is over eight times greater than the estimated coefficient of *ΔPRENI* (0.02229)¹⁵ for U.S. companies. This evidence suggests that Japanese managers smooth net income to a significantly greater degree than their U.S. counterparts.

8. Additional analysis

As an additional analysis, we employ SUR (Zellner, 1962). This method fully exploits any matched-sample dependency between our sampled U.S. and Japanese firms and improves the power of our tests. Specifically, SUR is useful when the error terms are believed to be contemporaneously correlated across equations. In this case, Zellner (1962) has shown that estimating the two equations simultaneously, although they may be seemingly unrelated, can improve the efficiency of the estimators over that found if each is estimated separately (Gujarati, 1995). The sample of firms used in this study are matched on size and industry, and therefore, it is possible that the error terms for the matched U.S. and Japanese companies at the same point in time are correlated. Thus, the SUR method may be appropriate to test the

¹⁵ This amount is the sum of the coefficients of the variables *ΔPRENI* and *ΔPRENI * COUNTRY*.

hypotheses stated above. This methodology estimates coefficients for U.S. and Japanese companies separately, and therefore, the hypotheses are tested by examining for differences between the U.S. and Japanese test variables' coefficients.

The SUR model employed to test Hypothesis 1 is as follows:

$$\Delta\text{ACCRUAL} = b_0 + b_1\Delta\text{PRENI} + b_2\text{LAG_}\Delta\text{ACCRUAL} + \text{FIRMXX} \\ + \text{YEARXX} + \varepsilon$$

where,

$\Delta\text{ACCRUAL}$, ΔPRENI , $\text{LAG_}\Delta\text{ACCRUAL}$, FIRMXX , and YEARXX are the same variables used in the simultaneous equation model and are defined above.

Hypothesis 1 is tested by examining for differences between the specific country coefficients estimated for the variable ΔPRENI . The magnitude of this coefficient may be used as a metric for the degree of income smoothing. Again, SUR estimates a coefficient relating to this variable for both U.S. and Japanese companies. A difference between these coefficients would support Hypothesis 1.

Hypothesis 2 is tested by examining the association between current year changes in core earnings and R&D investment. The SUR model employed to test Hypothesis 2 is a modified version of the one described above and is as follows:

$$\Delta\text{R\&D} = b_0 + b_1\Delta\text{PRENI} + b_2\text{LAG_}\Delta\text{R\&D} + \text{FIRMXX} + \text{YEARXX} + \varepsilon$$

where,

ΔPRENI , $\text{LAG_}\Delta\text{R\&D}$, FIRMXX , and YEARXX are the same variables used in the simultaneous equation model and are defined above. Hypothesis 2 would be supported if a difference was found between the b_1 estimates generated by SUR for U.S. and Japanese companies.

Table 6 presents the results of the SUR model used to test whether U.S. and Japanese managers use discretionary accruals to smooth net income. Panel A (Panel B) shows the estimated coefficients for U.S. (Japanese) companies. The test variable of interest, ΔPRENI , has a negative and marginally significant coefficient for Japanese companies (P -value = .136) and is not statistically significant at any conventional level for U.S. companies. The amount of difference of these two coefficients is statistically significant (P -value = .013), which lends support for Hypothesis 1. Overall, these results marginally support that Japanese managers use discretionary accruals to smooth income to a greater degree than their U.S. counterparts.

Table 7 presents the results of the SUR model used to test whether U.S. and Japanese managers use R&D investments to smooth net income. Panel A (Panel B) shows the estimated coefficients for U.S. (Japanese) companies. The test variable of interest, ΔPRENI , has a significantly positive coefficient for both U.S. and Japanese companies (P -value < .01 and .001, respectively). This suggests that both U.S. and Japanese managers use R&D investments to smooth net income.

To test Hypothesis 2, we compared the coefficients on ΔPRENI between U.S. and Japanese companies. The estimated coefficient of ΔPRENI for Japanese companies is nearly seven times greater than the estimated coefficient of ΔPRENI for U.S. companies, and these coefficients are statistically different at a high level of significance (P -value < .001). Consistent with the simultaneous equations results, these results support Hypothesis 2 and

Table 6
SUR results — discretionary accruals

$$\Delta \text{ACCRUAL} = b_0 + b_1 \Delta \text{PRENI} + b_2 \text{LAG}_{\Delta \text{ACCRUAL}} + \text{FIRMXX} + \text{YEARXX} + \varepsilon$$

Variable	Predicted relation	Estimated coefficients	Standard errors	<i>t</i> statistic
Panel A: U.S. companies				
<i>INTERCEPT</i>	none	– .00000	.00002	– .009
<i>ΔPRENI</i>	–	.00008*	.00007	1.192
<i>LAG_{ΔACCRUAL}</i>	–	– .56848	.07093	– 8.015**
Number of observations		186		
Model <i>F</i> -value (<i>df</i> =30)		3.223		
Model <i>P</i> -value		.0001		
Model <i>R</i> ²		.38		
Panel B: Japanese companies				
<i>INTERCEPT</i>	none	– .00000	.00002	– .046
<i>ΔPRENI</i>	–	– .00023*	.00021	– 1.103
<i>LAG_{ΔACCRUAL}</i>	–	– .30108	.05312	– 5.668**
Number of observations		186		
Model <i>F</i> -value (<i>df</i> =30)		1.813		
Model <i>P</i> -value		.0106		
Model <i>R</i> ²		.26		

ΔACCRUAL=change in discretionary accruals from the prior year/net sales; *ΔPRENI*=change in core earnings from the prior year/net sales; *LAG_{ΔACCRUAL}*=1-year lag of the dependent variable; *FIRMXX*=dummy variables to control for each matched set of U.S. and Japanese companies; *YEARXX*=dummy variables to control for the years 1977–1993.

* Coefficients are significantly different (*P*-value=.013) for U.S. vs. Japanese companies.

** Statistically significant at less than the .001 level based on one-tailed (two-tailed) tests for variables whose relation to the dependent variable is (is not) predicted.

suggest that Japanese managers use R&D expenditures to smooth net income to a greater degree than their U.S. counterparts.

8.1. Sensitivity tests

In order to test the robustness of our results and the specification of our models, we performed several sensitivity analyses. First, we address the possibility that the positive relationship between *ΔR&D* and *ΔPRENI* reflects differences in investment opportunities or incentives rather than differences in accounting treatment. The simultaneous equations were rerun including a control variable proxying for the change in investment opportunities as a right-hand side variable of the *ΔR&D* equation. Several control variables were used to proxy for investment opportunities, including change in cash (both pre-R&D and ending cash balance) from prior year, level of ending cash (both pre-R&D and ending cash balance), and the change in capital expenditures from the prior year. The change in capital expenditures from the prior year was the only proxy statistically significant (.001). The positive coefficient on this variable suggests that R&D expenditures are correlated with investment opportunities

Table 7
SUR results — R&D

$$\Delta R\&D = b_0 + b_1 \Delta PRENI + b_2 LAG_ \Delta R\&D + FIRMXX + YEARXX + \epsilon$$

Variable	Predicted relation	Estimated coefficients	Standard errors	t statistic
Panel A: U.S. companies				
<i>INTERCEPT</i>	none	-.00354	.00282	-1.257
<i>ΔPRENI</i>	+	.02459*	.00890	2.764**
<i>LAG_ΔR&D</i>	+	.27254	.08520	3.199**
Number of observations		200		
Model <i>F</i> -value (<i>df</i> =31)		7.795		
Model <i>P</i> -value		.0001		
Model <i>R</i> ²		.59		
Panel B: Japanese companies				
<i>INTERCEPT</i>	none	.00495	.00204	2.427***
<i>ΔPRENI</i>	+	.16793*	.02399	7.000****
<i>LAG_ΔR&D</i>	+	.03342	.07845	.426
Number of observations		200		
Model <i>F</i> -value (<i>df</i> =31)		9.241		
Model <i>P</i> -value		.0001		
Model <i>R</i> ²		.63		

$\Delta R\&D$ = change in R&D expenditures from the prior year/net sales; $\Delta PRENI$ = change in core earnings from the prior year/net sales; $LAG_ \Delta R\&D$ = 1-year lag of the dependent variable; $FIRMXX$ = dummy variables to control for each matched set of U.S. and Japanese companies; $YEARXX$ = dummy variables to control for the years 1976–1993.

* Coefficients are significantly different (P -value = .000) for U.S. vs. Japanese companies.

** Statistically significant at less than the .01 level based on one-tailed (two-tailed) tests for variables whose relation to the dependent variable is (is not) predicted.

*** Statistically significant at less than the .05 level based on one-tailed (two-tailed) tests for variables whose relation to the dependent variable is (is not) predicted.

**** Statistically significant at less than the .001 level based on one-tailed (two-tailed) tests for variables whose relation to the dependent variable is (is not) predicted.

from year to year. However, the variables of interest, $\Delta PRENI$ and $\Delta PRENI * COUNTRY$, remain highly significant in the same direction as previously reported. Thus, the relationship between $\Delta R\&D$ and $\Delta PRENI$ remains after controlling for changes in investment opportunities, which suggests that the selected companies' managers smooth income using R&D expenditures. Additionally, the significant interaction term ($\Delta PRENI * COUNTRY$) suggests that Japanese companies smooth income using R&D expenditures to a significantly greater degree than their U.S. counterparts, which is consistent with our previously stated results. In summary, the variables of interest remain statistically significant in the consistent direction for all of the models that included the previously stated proxies for investment opportunities.

Second, we observed studentized residuals to identify possible outlier observations. The models were rerun excluding potential outlier observations, and the results remain unchanged from those stated. Third, we used different methods to control for firm size effects.

Specifically, we reran the models after (1) dividing the variables by total assets and (2) including a size variable as a separate independent variable. The results from all these models remain unchanged from those reported. Fourth, we tested our model specification by examining the sensitivity of our results on higher-order lags of our dependent variables. Specifically, second- and third-order lags were included in our models. Again, the results remained unchanged from those reported. Finally, the potential effects of the “bubble burst” of the Japanese economy were considered. We partitioned our data to before and after the “busting of the bubble” (i.e., pre- and post-1990). We reran our models using each of these data sets, and the results remain unchanged for both data sets from those reported. Based on the results from these sensitivity tests, we conclude that our results are robust.

9. Discussion and conclusion

This paper performs an examination for differences in the level of myopic management behavior between U.S. and Japanese companies. We contend that the act of manipulating R&D investments, and to a lesser extent accounting accruals, to obtain a targeted current period earnings amount is reflective of myopic management behavior. We examine the extent to which managers of both countries use (1) discretionary accruals and (2) R&D investments to smooth income. Our results suggest that neither U.S. nor Japanese managers use discretionary accruals to smooth income. However, the results suggest that both U.S. and Japanese managers use R&D investments to smooth income and that Japanese managers do so at a significantly greater degree. These results provide evidence that the different corporate environments of each country are associated with different management behaviors.

Our results are consistent with U.S. managers resisting the inherent incentive to smooth income at the detriment of the long-term value of the firm more so than their Japanese counterparts. Overall, both countries' managers smooth income using R&D investments, but Japanese managers do so to a significantly greater degree. Thus, apparently because of their corporate environment surroundings (particularly an active stock market), U.S. managers appear better able to resist the inherent desire to smooth earnings than their Japanese counterparts. This is consistent with the stream of literature that supports the efficient market hypothesis and suggests that the nonmyopic U.S. stock market helps promote long-term management behavior (Abarbanell & Bernard, 1995; Kothari & Sloan, 1992; Loudder & Behn, 1995; Shevlin, 1991).

Given the plethora of financial press in the 1980s that promoted Japanese management superiority over their U.S. counterparts, some readers may find these results counterintuitive. In hindsight, the Japanese bubble burst in the early 1990s suggests that the conventional wisdom of the 1980s regarding the Japanese corporate environment may have been flawed. That is, perhaps Japanese managers had greater opportunity to engage in myopic behavior because they did not face the monitoring of a nonmyopic stock market. Additionally, perhaps the keiretsu system creates the incentive for management to signal growth and stability to their fellow keiretsu members, which results in the myopic behavior of income smoothing.

The recent changes to the Japanese business environment suggest that Japanese companies are slowly moving toward a more equity-focused environment. For example, stock option

plans were recently legalized; hostile takeover threats have begun to surface; the lifetime employment concept is disappearing; and cross-shareholdings among keiretsu members are declining (Amaha, 1999; Business Week, 1999; Levinson, 1992; Moffet, 1999; Shibata, 1992, 1998; Weinberg, 1997). Not surprisingly, a call for an overhaul of the Japanese keiretsu system is beginning to surface in the financial press (Business Week, 1999; Hanke & Walters, 1994). In support of the recent changes in the Japanese business environment, the results from our study suggest that a more capital market-focused environment may help promote long-term focused management behavior.

This study is subject to limitations. The companies included in the sample are all large firms that are listed on U.S. stock exchanges. These companies, and the behavior of their management, may not be representative of other companies incorporated in the respective countries under study, and thus, the generalization of the results may be questioned. Also, while this study examines smoothing net income via discretionary accruals and R&D investments, there exist other ways in which management can smooth net income (e.g., repairs and maintenance expenditures, advertising expenditure, and managing the timing of asset sales). Perhaps, our examination of only two income-smoothing vehicles is not reflective of the overall smoothing strategies employed by the sampled companies. Additionally, the available vehicles to manage earnings may not be equal for Japanese and U.S. companies. That is, perhaps U.S. companies have greater opportunity to employ the alternative earnings management vehicles (i.e., other than discretionary accruals and R&D expenditures). If one country is systematically employing these alternative vehicles to smooth income more so than the other country, our results may be misleading. We encourage future research to identify and examine for differences of usage between U.S. and Japanese managers regarding these alternative methods. Finally, there may be omitted variables that are correlated with both the change in premanaged net income variable and the variable used to measure earnings management. This paper provides some initial empirical results related to possible differences in behavior between U.S. and Japanese managers. We hope our results will encourage further research in this area.

Acknowledgments

We acknowledge the helpful comments of Susan Ayers, Peter Bearnse, Bruce Behn, Joseph Carcello, Dick Riley, Ron Shrieves, and Dan Simunic.

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Book Review Section

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Pergamon

The International Journal of Accounting
36 (2001) 117–123

**The
International
Journal of
Accounting**

Book reviews

International Accounting: A User Perspective

by Shahrokh M. Saudagaran South-Western College Publishing/Thomson Learning, Cincinnati, Ohio, 2001, xii+228 pp.

International Accounting: A User Perspective, by Shahrokh M. Saudagaran, is well written and approachable. This text's coverage and organization are similar to Mueller, Gernon, and Meek [MGM] (1997) and the new 5th edition, Gernon and Meek [GM] (2001). Yet, the content and level of discussion are more developed, suitable for its target audience of senior undergraduate accounting majors, graduate students, and executives. With this target audience, the author appropriately adopts a user perspective to understanding international financial accounting and reporting. A distinctive feature of the text is that it effectively incorporates relevant research into the presentation and discussion of topics. However, despite adopting a user perspective, a drawback of the text is that too little substantive discussion is devoted to major differences in accounting measurement across countries and financial statement analysis across countries.

The book's seven chapters cover five main topics: reasons for differences in accounting across countries and accounting harmonization (Chapters 1 and 2), major accounting measurement issues and differences (Chapters 3 and 4), using financial statements across countries (Chapter 5), emerging markets (Chapter 6), and issues in managerial accounting (Chapter 7). The coverage of the first two chapters on reasons for differences in accounting across countries and accounting harmonization, as well as the last chapter on managerial accounting, are similar to Chapters 1, 3, and 11, respectively, in MGM (1, 3, and 10 in GM). Of the two chapters on major accounting measurement issues and differences, one focuses on foreign currency accounting and the other covers four topics: accounting for changing prices, goodwill and intangible assets, geographical segment disclosures, and social reporting.

The foreign currency accounting chapter presents the topic in depth, covering SFAS 8, SFAS 52, and IAS 22. Materials in the chapter are also timely, highlighting the transition to the euro and derivative accounting. If the book is used as a supplement in an advanced accounting course, a significant amount of the material in this chapter may overlap with the advanced accounting text.

The other chapter on major accounting issues and differences across countries, entitled, "Selected Financial Reporting and Disclosure Issues in the Global Context," is disappointing in depth, integration of research, and number of issues selected. In discussing accounting for changing prices, the text perpetuates the confusion that general price level accounting and current cost accounting are both alternative methods of inflation accounting (p. 90).

While other chapters do integrate relevant research, this chapter would benefit from references to work such as Barth and Clinch (1998) and Easton, Eddey, and Harris (1993) on current cost accounting or Amir, Harris, & Venuti (1993) on major differences in accounting measures across countries. Even though the four topics that the author selects are major issues and differences in accounting across countries, other major issues with significant potential economic exposure, such as accounting for pensions, postretirement benefits, and deferred taxation, are not discussed. These topics may be considered more advanced topics, not appropriate for an introductory accounting text, but their exclusion could significantly mislead a user of the financial statements about a company's operations and financial position.

Similarly, the chapter on using financial statements across borders, entitled "Using Corporate Financial Reports Across Borders," devotes too few pages to analyzing and comparing companies across countries. The majority of the chapter discusses preparers' and users' responses to financing and investing in a global environment, similar to the discussion in MGM's Chapter 4. While this information is interesting, it does little to offer guidance on how to use corporate financial reports across countries. The pages (144–148) devoted to international financial statement analysis discuss main issues using a study by Choi et al. (1983) that compares key financial ratios of Japanese, Korean, and US firms. This approach is effective, and the chapter would benefit by expanding along the same lines.

Questions, exercises and cases, included in end-of-chapter materials, are more sophisticated than those found in MGM and better suit the intended audience. Questions are targeted and thought-provoking; many are open-ended to provide a base for an interesting discussion. The exercises, which reinforce and extend material presented in the text, are more stimulating than the cases. The exercises often ask students to seek additional materials such as financial statements from real companies on the web and analyze relevant aspects related to the chapter. Cases, which analyze a fictional company or situation, are short, self-contained, and somewhat contrived.

In view of its coverage and length, the text is appropriate as a supplemental text in an advanced accounting course. It also could serve as the basis for an international accounting course but would require additional, substantial supplemental materials.

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PII: S0020-7063(01)00088-7

International accounting, financial reporting, and analysis

by Allan B. Afterman, New York, NY, Warren Gorham & Lamont/RIA Group, Release 11, 1999, three-ring binder, four updates per year

The stated purpose of this book is to provide a comprehensive reference source for identifying accounting and financial reporting diversity among foreign countries, and to assist users of foreign financial statements and others to assess the impact of diversity on reported amounts. Release 11 of the book uses a cut-off of June 1, 1999 with occasional reference to other dates. Updating occurs four times a year, thus requiring the book to be in loose-leaf form.

This book is not intended to be a manual of accounting standards for any of the countries covered. The countries are grouped in four geographic regions, which include (the number of countries in each region is indicated in parentheses): the Americas (5), Asia/Pacific (7), Europe (8), and Africa/Middle East (2). All of the major economic national powers are in these groups as are the European Union (EU) and International Accounting Standards Committee (IASC). The author has employed a variety of sources to compile the book's contents, including official standards, unofficial publications, and conversations with standard setters and practicing accountants in foreign countries.

Three parts, labeled A, B, and C, divide the book into sections covering the gamut indicated by its title. Part A looks at the accounting and financial reporting of U.S. multinational enterprises. Part B is devoted to comparative international accounting, and Part C covers a variety of additional topics.

Part A is itself divided into three topics. Accounting for foreign currency-denominated transactions, following the guidance contained in Statement 52 of the Financial Accounting Standards Board (FASB), is covered first. Translation of foreign currency-denominated financial statements is the next topic, once again following Statement 52 guidelines. Both topics are described, analyzed, and illustrated in sufficient detail to assist a person unfamiliar with these subjects to understand the required accounting and financial reporting. Illustrations include journal entries, consolidation work papers, and summarizing tables. The treatment of these two topics is similar to that found in Advanced Accounting textbooks. The third topic deals with accounting for exchange rate risk management using derivative instruments.

Hedging of exchange rate risk is explained and illustrated by drawing on FASB Statements 52 and 133. The latter pronouncement deals with derivative instruments. Statement 138, a modification of Statement 133, was released after the date of this book. However, the author does not cover all aspects of hedging in Statement 133, choosing to focus on foreign currency risk. For example, interest rate risk and forecasted transactions are not included. Even the topics covered are not complete, as can be seen in the section on currency swaps where there are no examples or the section on options that does not mention "collars." Overall, this section is done on an introductory level that will prove unsatisfactory to a reader who is searching for a deeper understanding of the topic of hedge accounting.

Part B comprehensively compares the accounting and financial reporting of 18 countries, the IASC, and the EU. The 18 countries are listed on pages B1-40 and B1-41. In addition, the accounting in four selected developing countries — Argentina, Brazil, China, and Poland — is briefly summarized. Specific areas of comparison were selected from a 1993 Securities and Exchange Commission (SEC) study that identified the most frequently cited items requiring reconciliation to U.S. GAAP. They include topics such as capitalization of interest cost, pension costs, deferred taxes, and consolidation. Additional topics were selected for coverage because of their diversity among nations and their potential significance to earnings. All told, more than 60 specific, broad accounting topics are covered. Each topic is discussed, comparisons made between countries, ample illustrations provided of financial displays and notes, and the analytical implications of differences pointed out. Throughout Part B, U.S. GAAP serves as the benchmark. This section is very well done and should prove to be a valuable reference to a variety of readers.

Part C deals with a number of different topics, starting with the financial reporting of foreign companies wishing to offer securities in U.S. markets or list their securities on an exchange or on the national over-the-counter (NASDAQ) market. In this section, there is extensive examination and illustrations of SEC requirements for registration statements and financial statements, both interim and annual. The reconciliation of home jurisdiction accounting with U.S. GAAP is illustrated, using disclosures from an actual filing made with the SEC. Management's discussion and analysis of a foreign company is also illustrated and contrasted with that of a U.S. firm. The experience of Daimler-Benz (now DaimlerChrysler) in listing their stock in the U.S. is described and analyzed, thereby providing an insightful look at the complications faced by foreign firms but also demonstrating why the SEC's steadfast position of not making exceptions to their rules is necessary.¹ Methods of working around SEC requirements, by employing private placements and offshore transactions (Regulation S), are explained.

The second section considers the issue of the reliability of financial information by looking at auditing standards and practices in foreign countries. Auditing standards are briefly examined and auditors' reports from several countries illustrated. Some procedures are described and contrasted between certain countries. Several other auditing-related topics,

¹ The principal issue concerned the use by Daimler-Benz of "hidden reserves" and income smoothing over time.

such as the harmonization of standards, are also touched upon. The treatment in this section is not exhaustive; however, the book does not hold itself out as dealing with auditing.

Analyzing financial statements of foreign entities is the next area of focus. Initially, comparative analysis of firms from the same jurisdiction is discussed and examined. Then, the problem of analyzing and comparing firms in different jurisdictions is considered. The difficulty of making the latter kind of analysis of financial information is well demonstrated. Finally, a framework for comparative multijurisdictional analysis is proposed, including a comprehensive checklist for identifying international accounting differences.

The next section covers techniques of financial statement analysis, such as ratios and common-size statements. The examples used to illustrate this kind of analysis are well done, being similar to materials found in textbooks. In the following section, three excellent case studies of financial statement analysis are provided, including the use of the checklist mentioned above and a complete set of financial statements of the subject companies. These carry the subject of statement analysis to a higher level. Cash flow statements and analysis is the subject of the final section in Part C. How to construct statements, the definitions of operating cash flows, and the uses of cash flow analysis are laid out. How diverse accounting standards affect cash flow analysis is discussed, with particular attention to specific areas, such as revenue recognition and leased assets. This latter portion is especially interesting and helpful.

Five appendices and a glossary conclude the book. Appendix A contains the financial statements of three foreign companies. Appendix B summarizes International Accounting Standards and compares them to U.S. GAAP. Appendix C is a checklist of accounting differences, by each of 17 countries and International Accounting Standards, with cross-references to Part B of the book. Appendix D is the prospectus of a Brazilian company that was filed with the SEC. The last appendix, E, is a list of the three-character currency codes established by the International Standards Organization.

In conclusion, this book achieves its objects and is a worthwhile reference book for those involved in the international financial arena.

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PII: S0020-7063(01)00089-9

The history of accounting: critical perspectives on business management

John Richard Edwards (Ed.), Routledge, London, 2000, four volumes, lii+1959 pp., £475 (approximately US\$680).

This is a handsome, four-volume set that brings together 68 previously published research articles and chapters from books on the broad subject of accounting history. The editor and

compiler, who has written an insightful introductory essay that nicely characterizes and positions these articles as well as many others that are not reproduced here, is the distinguished British accounting historian John Richard Edwards, the founder and editor of *Accounting, Business and Financial History*. The introductory essay constitutes a valuable guide and explanation both for novices and experienced historians.

Of the 68 reproduced works, 62 were published since 1980, and a further six were published between 1964 and 1977. All of the works are therefore of recent vintage, and, from what I can determine, all of their authors are living.

Edwards' stated aims have been to assemble readings (1) for courses on accounting history and as background for other courses; (2) as an initial source of reference for doctoral students and members of faculty who are embarking on accounting history research; and (3) for the edification of business historians (p. xxiv). The collection of readings represents excellent coverage of the landscape of accounting history research in the last quarter century, reflecting a wide range of subject areas and methodologies. The four volumes are divided into topical areas: method and theory; recording and reporting; cost and management accounting; and the professionalization of accounting. Despite the impression given by the book's subtitle, Edwards provides a good representation of work from both the traditional and "new" historians.

As a member in good standing of the guild of book reviewers, I am obliged to ask whether this enterprise suits its aims. In countries with an emerging accounting research culture, as well as in countries where English is not the ruling language, this four-volume set will fill an important need, if the cost can be managed. In the UK, North America, and Australia, one suspects that libraries and academics are not likely to spend £475 for a four-volume set, most of whose contents are accessible in leading journals. Of the 63 articles in the collection taken from journals, 29 were published in journals that, in a recent study of the accounting research journals received by 12 leading libraries (Zeff, 1996), were received by all 12 libraries. A further 15 were published in journals received by at least eight of the 12 libraries. Thus, a total of 44, or 70%, of the journal articles are likely to be available in good research libraries. For other libraries, the cost, again, could be an obstacle.

The tariff for the four-volume set probably could have been significantly reduced if the articles had been photoduplicated instead of entirely reset. Moreover, photoduplication would have had the major advantage of preserving the original page numbers of the reproduced articles and chapters, so that citations to those page numbers, which appear in the editor's introductory essay and in articles throughout the collection, could actually be used to find the full context of what is being cited or quoted. Ball and Smith (1992) represent a good example of a large collection of research articles produced by photoduplication.

None of the "classic" articles or chapters by deceased authors such as Hatfield, Littleton, the De Roovers, Garner, and Solomons was included. Edwards defends their omission on the ground that "they have been the subject of subsequent review, discussion and analysis in papers that *are* reproduced here" (p. xxiv). Yet quite a few of the articles included in the collection are also analyzed and discussed in other articles in the collection, as well as by the editor in his introductory essay. A better argument is that the editor has chosen to place emphasis on the advances made during the last 20–30 years.

It would have been apposite to the stated aims of the book, which are unquestionably worthy, if the excellent series of annotated bibliographies of works on accounting history by Parker (1969, 1977, 1980, 1988) were to have been included. These bibliographies draw attention to books as well as articles. Other than for this omission, I will not presume to second-guess the editor's selection of items to be included.

This is indeed a valuable collection that amply testifies to the major progress that accounting history research has achieved in the last quarter century. Three journals have been founded that are devoted exclusively to such research, and other journals of high standard cater to work in history. As the editor's introductory essay and a number of the reproduced items bring out, battles are being fought between the partisans of new approaches to historical inquiry and the defenders of the *ancien régime*. Samuelson (1963, p. 231) has wisely written that "Methodological discussion, like calisthenics and spinach, is good for us." Tolerance of methodological diversity is a sign of maturity in a literature, and one hopes that the expanse of approaches that are richly on display in this anthology will continue to illuminate the horizon.

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THE INTERNATIONAL JOURNAL
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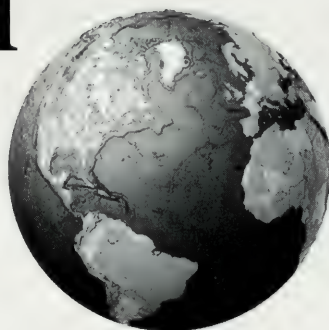
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Name of publication: **THE INTERNATIONAL JOURNAL OF ACCOUNTING** (ISSN:0020-7063)
Office of publication: Elsevier Science Inc.
655 Avenue of the Americas
New York, NY 10010-5107

Published quarterly. Annual institutional subscription rates for 2001: European countries, NLG 565.00 (euro 256.39); all countries except Europe and Japan: US\$289. Associated personal price for 2001: all countries except Europe and Japan: US\$112.

POSTMASTER send address changes to:

Subscription Dept.: Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010-5107.

Editorial Office: Center for International Education & Research in Accounting
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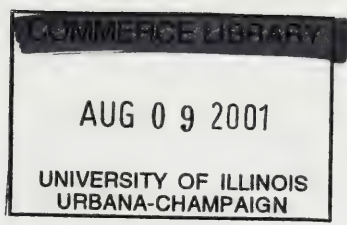
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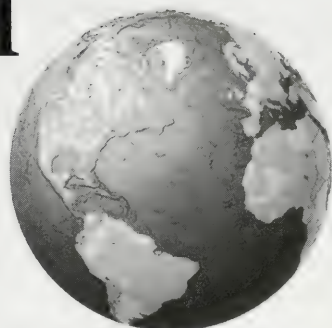
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**The
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The impact of culture on the relationship between budgetary participation, management accounting systems, and managerial performance: An analysis of Chinese and Western managers

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Abstract

This study tests the hypothesis that the behavior and attitudes of Chinese and Western managers to budgetary participation will be different because of cultural differences. Chinese managers are used to represent managers from a high-collectivist, large-power distance, and long-term orientation culture while Caucasian expatriate managers are used to represent a culture that is low-collectivist, small-power distance, and short-term orientation. Data were collected from 51 Chinese subunit managers in Xian, China and 38 Caucasian expatriate subunit managers in Hong Kong who were requested to respond to questionnaires designed to measure the 'availability' of broad scope and timely management accounting systems (MAS), budgetary participation, and their managerial performance. Multiple regression analysis showed that the three-way interaction term was significant, thus, suggesting that the interaction effects of MAS and budgetary participation on managerial performance were different, depending on the cultural background of the managers. More specifically, the relationship between MAS information and managerial performance of Chinese managers was negative for high levels of participation but positive for Caucasian managers. These results have implications for the design of effective control subsystems and suggest that the management accounting theories developed in the context of Western economies may not be generalizable to the Chinese environment. © 2001 University of Illinois. All rights reserved.

Keywords: Culture; Budgetary participation; Management accounting systems; Managerial performance

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1. Introduction

A significant strand of management accounting research focuses on the notion that national cultural variables could affect the relationship between management control systems and performance (Awasthi, Chow, & Wu, 1998; Birnberg & Snodgrass, 1988; Chow, Shields, & Chan, 1991). It is argued that people from different cultures have different attitudes to similar management control systems and management practices (Chow, Harrison, Lindquist, & Wu, 1997; Harrison, 1992). As a result, management control tools and management practices found to be effective in one environment could be ineffective or even dysfunctional in another environment (Chow, Kato, & Merchant, 1996). Thus, these differences as a result of culture have far reaching implications for the design and implementation of management control systems in different countries.

While there are a number of studies that have examined the relationships between culture and various aspects of marketing and organizational behavior, research on the relationship between culture and management control systems is by comparison still scarce (Harrison & McKinnon, 1999; Kagitcibasi & Berry, 1989). In particular, there have only been a handful of studies that have examined managers' attitudes to management control systems across national boundaries (Awasthi et al., 1998; Birnberg & Snodgrass, 1988; Chow et al., 1996; Chow, Kato, & Shields, 1994; Dunk, 1989; Harrison, 1992; Harrison, McKinnon, Panchapakesan, & Leung, 1994; Merchant, Chow, & Wu, 1995). For example, Birnberg and Snodgrass (1988) conducted a field study in US and Japan and found that culture affects the nature of formal control system. Another study conducted in Australia and Singapore found that culture influenced the relation between reliance on accounting performance measures in the evaluative style of superiors and work-related attitudes of subordinates (Harrison, 1992). Other aspects of management controls such as the link between budgetary participation and management accounting systems (MAS) still remain to be explored. Most studies (Chow et al., 1991, 1996; Daley, Jiambalvo, Sundem, & Kondo, 1985; Harrison, 1992; Harrison et al., 1994) have focused on managers in Japan, US, Singapore, and Australia with little or no evidence on how Chinese managers would behave. The extension of these types of studies to Chinese managers is important given the recent surge of multinational business activities in China and the lack of empirical data on Chinese management accounting practices. Moreover, Chinese culture emphasizes values that are diametrically opposed to Western values (Gul & Tsui, 1993, 1995; Hofstede, 1991). Thus, empirical evidence from China would provide important insights into the role of culture in the application of management accounting across national boundaries.

This study examines how MAS and budgetary participation affect the performance of Chinese subunit managers in the Chinese Mainland and expatriate Caucasian managers in Hong Kong. Both MAS (Chenhall & Morris, 1986) and budgetary participation (Brownell, 1982a; Lau, Low, & Eggleton, 1995; O'Connor, 1995) have been identified as key elements in a firm's management control system that is expected to affect managerial performance. However, according to Hofstede (1980, 1991), Chinese managers are

expected to behave differently from Western managers in managerial decision-making situations such as budgetary participation because of cultural differences.¹

In the case of budgetary participation, there are at least two further aspects to consider. The first issue relates to the motivational role of participation. The dominant Western theories on motivation such as the needs-based theories (Alderfer, 1972; Herzberg, Mausner, & Synderman, 1959; Maslow, 1954; McClelland, 1975) all emphasize that recognition, influence, and achievement are primary motivators. Participation in the decision-making process caters to these needs of recognition and influence and is, therefore, likely to be a motivating factor. However, the application of these theories in a non-Western environment is questionable. Hofstede (1980) argued that these motivational theories are culture-bound and are relevant only to Western countries. Similarly, Kanungo (1983) suggested that while we may accept the needs to motivate employees, the nature of those needs may be influenced by cultural values. In a recent survey in China, it was found that Herzberg's model had to be modified for it to be applied to the Chinese environment (Yu, 1991). Thus, the motivational role and advantages of participation is not clear in a non-Western environment. Second, even though the participative decision-making style is used in non-Western culture, it, in itself, is not widely accepted in Asian cultures. Several studies have shown that a more directive style whereby the leader or top management makes a decision on his own and then persuades the subordinates to accept that decision is preferred in Asian cultures (Deyo, 1978; Redding & Casey, 1976; Redding & Richardson, 1986). Moreover, unlike Western cultures where direct objections and frank discussions are preferred, managers in Asian cultures prefer restraint, politeness, and indirect objections (Kirkbride, Tang, & Westwood, 1991; Thompson, 1989). Thus, the participative decision-making style is not expected to be consistent with Chinese culture which has, until recently, been insulated from Western ideology. As a result, the expected positive relationship between MAS and managerial performance for high levels of budgetary participation, as expected in Western society, may not exist for Chinese managers in the Mainland.

Section 2 of the paper provides a review of the relevant literature, which leads to the development of the hypothesis tested in this study. This is followed by Section 3, which is about the methodology of the study, and Section 4, which discusses the results and conclusions.

2. Hypothesis development

As pointed out earlier, both participation and other accounting information system (AIS) tools should be viewed as a control package and are considered interdependent (Emmanuel, Otley, & Merchant, 1990). For example, participation may be more meaningful in organizations that have sophisticated MAS so that managers can use that information for participative decisions on resource allocation among the operating units (Chow, Cooper, & Waller, 1988; Waller, 1988). Further, with the opening up of the Chinese economy and

¹ The idea that culture can affect the budget participation–performance relationship was also suggested by Brownell (1982a).

Western influence, some level of participation is being practiced but their use is not as entrenched as MAS information for purposes of control (Fang & Tang, 1991). However, the role of participation in China is not clear since, as pointed out earlier, there are cultural factors which suggest that participation in the budgetary process could, in fact, be dysfunctional.

Hofstede (1991) and Hofstede and Bond (1988) identified five dimensions of culture that are labeled power distance, uncertainty avoidance, collectivism, masculinity, and long-term orientation.² Of relevance in this context are the dimensions of power distance, collectivism, and long-term orientation since these three dimensions may be theoretically linked to budgetary participation. Power distance is defined as the degree of inequality among people. This can range from relatively equal (small-power distance) to extremely unequal (large-power distance). In the large-power distance countries, individuals accept the inequalities that exist in society and even subscribe to such inequalities. Authority and seniority are important and individuals are comfortable with the superior–subordinate relationships. In a recent study, Hofstede (1993)³ suggested that China is at the high end of the power distance scale compared to the US, which is on the low end of the scale, where equality and participatory management would have positive motivational effects.

Collectivism is defined as the form and manner of the relationship between an individual and others in society. Chinese society is characterized by a high degree of collectivism while Western society emphasizes individualism (Meindl, Hunt, & Lee, 1989). In low-collectivist (high individualist) Western society, the individual places his own interest above that of other members and questions of independence at work and the ability to influence organizational decisions becomes paramount. In high-collectivist societies such as China, individuals are committed to the group and they see themselves in a network of relationships. For these individuals, the need to be part of the decision-making process in the organization is less important than for individuals from low-collectivist societies (Meindl et al., 1989).

It is unlikely that participation will be effective in Chinese society, which is high-power distance and high-collectivist. Chow et al. (1996) also drew attention to the fact that participation is more likely to succeed in a society which has a highly individualist culture as in the US. On the other hand, participation in a culture that emphasizes collectivism such as in China (Hofstede, 1993) would not be successful in inducing goal congruence, communication, and coordination. Hofstede (1984, p. 394) also pointed out that subordinates in large-power distance countries

² According to Gul and Tsui (1993) and Perera (1989), it is necessary to examine the pertinent dimensions in the context of each study. In most cross-cultural studies, only the pertinent dimensions are used to explain cross-cultural differences in management control system (e.g., Chow et al., 1996; Harrison et al., 1994; O'Connor, 1995). Specifically, there is a substantial amount of literature that supports the association between individualism and participation (see Chow et al., 1991; Harrison, 1992; Lincoln & McBride, 1987). In addition, Frucot and Shearon's (1991) study provided evidence that power distance is an important cultural variable in explaining participation as well. It can also be argued that the most important characteristic of long-term orientation is the notion of *wu lun*, which is consistent with the dimension of power distance, characterized by the respect of authority and unequal relationships among people. Therefore, only these three dimensions are considered relevant for the context of this study.

³ For power distance, US had a score of 40 while China had a score of 80. Similarly, the individualism score for US was 91 and for China was 20.

have “strong dependence needs . . . and . . . expect superiors to behave autocratically and not to consult them.” Therefore, allowing subordinates to participate in budgetary matters would be counter to such expectations of authoritative leadership styles. In contrast, subordinates in small-power distance countries would prefer to participate in budgetary decision (O’Connor, 1995). Thus, on the basis of these cultural dimensions, it is unlikely that participation in the budgetary process would be successful in China.

Long-term orientation represents the idea of Confucian dynamism, which consists of the following values: persistence, thrift, having a sense of shame, ordering relationships by status, and observing this order (Hofstede, 1991). One of the most important characteristics of long-term orientation is the notion of *wu lun*, which emphasizes the respect for authority and the unequal relationships between people. *Wu lun* consists of five basic relationships: ruler–subject, father–son, older brother–younger brother, husband–wife, and senior friend–junior friend. For example, in an organization, the junior manager owes the senior manager respect and obedience; the senior manager owes the junior manager protection and consideration (Hofstede, 1991). Hofstede (1991) also found that long-term orientation is correlated with large power distance. China is classified as long-term while the US is classified as short-term.⁴ Therefore, in the Chinese culture that is classified as large-power distance and is long-term in its orientation, it is likely that participation would be frowned upon since it is inconsistent with the philosophy of unequal relationships based on the principles of *wu lun*.

Several control tools such as AIS including MAS information are now available in Chinese enterprises as a result of the economic structural reforms. For example, Fang and Tang (1991) drew attention to the fact that there are now concerted attempts to develop accounting information for both macro- and microeconomic management including sophisticated computerized management information systems. The AIS, in general, and MAS in particular, are being used at different levels by Chinese manufacturing companies to improve managerial performance. In this study, the MAS dimensions of scope and timeliness were selected because of their theoretical links with budgetary participation and managerial performance. MAS scope refers to the focus, quantification, and time horizon of the information (Chenhall & Morris, 1986; Gordon & Narayanan, 1984). Traditional MAS information in terms of scope would include information that is confined to the organization, financial in nature and essentially historical, whereas broad scope MAS information would also provide information that is external, nonfinancial, and future-oriented including probabilistic data. Timeliness refers to the provision of information on request and the frequency of reporting systematically collected information. A MAS that is characterized by the existence of high frequency reports and rapid feedback is considered to be more useful than one that lacks these features (Chenhall & Morris, 1986). Both these features of scope and timeliness of MAS are likely to positively affect managerial performance. For example, given the dynamic nature of the business environment, both broad scope and timely information will assist managers make more informative decisions which in turn will

⁴ The long-term orientation score for China is 118 while for US the score is 29.

improve performance (Gordon & Narayanan, 1984). Chenhall and Morris (1986, p. 31) emphasized the importance of studying this relationship:

Perhaps, most importantly, the effect of different types of MAS on managers' performance should be investigated. It is hoped that such approaches will enhance our abilities to understand what types of MAS are appropriate in different situations and, as a result, to improve the likelihood that MAS will help managers improve their performance and that of their organizations.

Taken together, both broad scope and timely MAS information are also expected to facilitate participative budgetary decision making. For example, broad scope MAS information would be useful in budgeting and evaluating the costs involved in servicing the diversity of decisions that managers face. Chenhall and Morris (1986) and Simon, Guetzkow, Kozmetsky, and Tyndall (1954) refer to the usefulness of broad-based "attention-directing" and "problem-solving" information to assist managers in pricing and sales, inventory control, and marketing. This presumably includes setting the sales budget, inventory budget, and advertising and marketing budget to name a few. Further, the evaluation of budgetary performance of subunit managers is also likely to be assisted by broad scope, nonfinancial information regarding managers' reliability, cooperation, and flexibility in the budget setting process (Chenhall & Morris, 1986; Hayes, 1977). Similarly, the provision of future-oriented information is likely to complement budgetary participation as this would improve managers' ability to make more informed decisions and formulate more realistic budgets. Timely MAS information would enhance the budgetary participation process since it reports on the most recent events and provides rapid feedback on the budgetary decisions.

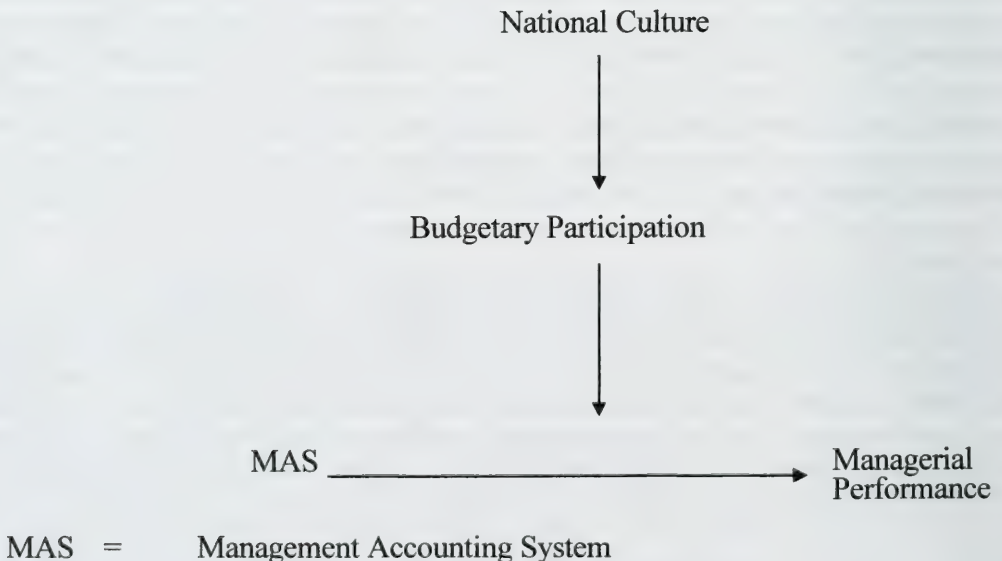


Fig. 1. MAS=Management Accounting System

In order to test the joint effects of MAS and budgetary participation on managerial performance, MAS is identified as the primary independent variable and budgetary participation is the moderating variable as shown in Fig. 1.

Budgetary participation is considered a moderating variable because the availability of MAS in improving managerial performance is likely to be influenced by participation. Thus, while a positive relationship between MAS and managerial performance is expected, it is likely to be moderated by budgetary participation; at high levels of budgetary participation, it is likely that there would be a negative relationship between MAS and managerial performance for Chinese managers. Chinese managers are expected to be uncomfortable with participation and this may negate the positive effects of MAS information on managerial performance. Since participation in decision making is consistent with Western cultural beliefs, a positive relationship between MAS and managerial performance is expected at high levels of budgetary participation for Western managers. This reasoning suggests the following three-way interaction hypothesis:

Hypothesis 1: The interaction effects of MAS and budgetary participation on managerial performance will be different depending on the cultural background of the managers. High levels of budgetary participation will be associated with a negative relationship between MAS and managerial performance for Chinese managers but will be associated with a positive relationship for Western managers.

3. Methodology

A survey was employed to collect the data for this study. Pilot tests of the Chinese versions of the different instruments were conducted prior to distribution to ensure that the translations were valid and reliable. Questionnaires were then distributed to subunit managers in selected Chinese manufacturing enterprises in Xian, China and English versions to Caucasian subunit managers in selected manufacturing enterprises in Hong Kong. The English version of the questionnaire consisting of four parts on the detailed measurement of the variables (as discussed below) with instructions to the respondents is attached in Appendix A.

3.1. Measurement of variables

Managerial performance was measured through a self-evaluation questionnaire (Mahoney, Jerdee, & Carroll, 1963). Respondents were asked to rate on a nine-point Likert scale their own perceived performance on eight subdimensions of planning, investigating, coordinating, evaluating, supervising, staffing, negotiating, and representing (Brownell & Hirst, 1986; Gul, 1991). An overall score calculated by averaging the eight subdimensions⁵ was used as a

⁵ Most prior studies used the overall measure for performance as the dependent variable. A number of Chinese managers did not complete the overall measure and in order to improve the sample size, the eight items were selected as the measure of performance. The high Cronbach's alpha value for the eight items suggests that this was appropriate.

measure for managerial performance. There is some criticism of this measure because of its subjective nature and the leniency bias of such self-rating scales. Empirical evidence, however, suggests that such concerns regarding subjectivity are unwarranted (Heneman, 1974; Venkatraman & Ramnujam, 1987) and the evidence regarding the extent to which self-ratings exhibit a leniency bias is equivocal (Nealey & Owen, 1970). A Cronbach's alpha value of .88 showed satisfactory convergence of the items.

Budgetary participation was measured by using Milani's (1975) six-item measurement instrument (Brownell, 1982b). The items measured subjects' perceptions of the amount of influence and involvement that a manager has on a jointly-set budget. Cronbach's alpha for the scale was .82.

MAS was measured by using the two dimensions adapted from the Chenhall and Morris' (1986) instrument. First, only the dimensions of scope and timeliness were examined, while Chenhall and Morris also examined the dimensions of aggregation and integration. Our selection of scope and timeliness is based on its theoretical linkages to budgetary participation (Gul, Shields, Fong, & Kwok, 1995) and performance (Gordon & Narayanan, 1984). Second, Chenhall and Morris evaluated the "perceived usefulness" of MAS, whereas in this study, we measured the "availability" of MAS. This modification was necessary since the dimensions of a MAS may be perceived to be "useful" but if they are not available, they are unlikely to have any impact on performance.

Nine questions based on the Chenhall and Morris (1986) instrument were included in the questionnaire in order to evaluate the availability of MAS scope and timeliness characteristics. Of these, five questions focused on the availability of external, nonfinancial and future-oriented information, i.e., broad scope characteristics. Four questions were asked on the frequency and speed of reporting in establishing the information characteristic of timeliness. It was decided to combine these items since factor analysis revealed that all the items loaded significantly on one factor. Cronbach's alpha for the nine items was .79.

Cultural background was operationalized in terms of dummy variables with 0 representing Chinese and 1 representing Western subunit managers, respectively.

Demographic statistics are given in Table 1. Descriptive statistics for the independent variable, MAS, and the moderating variable, budgetary participation, as well as the dependent variable, managerial performance for both Chinese and Western managers, and

Table 1
Demographic statistics

	Mean
<i>Chinese managers (N = 51)</i>	
Age	39.11
Experience	17.33
<i>Western managers (N = 38)</i>	
Age	35.76 ($t = 0.1586$)
Experience	16.71 ($t = 0.7585$)

their average scores for each subdimension, characteristic, and item for the above variables are given in Table 2.

Table 2
Descriptive statistics

Panel A: summarized dimensions				
Variables	Mean ^a	Standard deviation	Actual range	Theoretical range
<i>Chinese managers (N = 51)</i>				
Managerial performance (Y)	5.92	1.54	2.00–8.50	1.00–9.00
MAS (X ₁)	3.96	1.17	1.78–6.56	1.00–9.00
Budgetary participation (X ₂)	4.04	1.12	1.00–6.50	1.00–7.00
<i>Western managers (N = 38)</i>				
Managerial performance (Y)	6.59	1.34	1.88–8.88	1.00–9.00
MAS (X ₁)	3.95	1.11	1.67–6.50	1.00–9.00
Budgetary participation (X ₂)	5.15	1.17	1.00–6.83	1.00–7.00
Panel B: summarized subdimensions				
Variables	Average	Standard deviation	Actual range	
<i>Chinese managers (N = 51)</i>				
Managerial performance (Y)				
Subdimension 1	5.82	1.58	1.00–8.00	
Subdimension 2	5.98	2.01	1.00–9.00	
Subdimension 3	6.43	1.92	1.00–9.00	
Subdimension 4	5.96	1.87	1.00–9.00	
Subdimension 5	6.04	2.37	1.00–9.00	
Subdimension 6	4.94	2.63	0.00–9.00	
Subdimension 7	6.22	2.19	1.00–9.00	
Subdimension 8	5.67	2.19	1.00–9.00	
MAS (X ₁)				
Characteristic 1	4.69	1.77	1.00–7.00	
Characteristic 2	3.31	1.73	0.00–6.00	
Characteristic 3	3.27	2.03	0.00–7.00	
Characteristic 4	4.27	1.86	1.00–7.00	
Characteristic 5	3.02	1.75	0.00–7.00	
Characteristic 6	3.90	1.84	0.00–7.00	
Characteristic 7	3.94	2.11	0.00–7.00	
Characteristic 8	3.84	1.77	0.00–7.00	
Characteristic 9	3.65	1.98	0.00–7.00	
Budgetary participation (X ₂)				
Item 1	4.22	1.72	1.00–7.00	
Item 2	4.39	1.60	0.00–7.00	
Item 3	4.06	1.85	1.00–7.00	
Item 4	4.00	1.73	1.00–7.00	
Item 5	3.65	1.44	1.00–7.00	
Item 6	3.92	1.81	1.00–7.00	

(Continued on next page)

Table 2 (continued)

Panel B: summarized subdimensions			
Variables	Average	Standard deviation	Actual range
<i>Western managers (N= 38)</i>			
Managerial performance (<i>Y</i>)			
Subdimension 1	6.58	1.67	1.00–9.00
Subdimension 2	6.61	1.37	4.00–9.00
Subdimension 3	7.05	1.66	3.00–9.00
Subdimension 4	6.61	1.64	1.00–9.00
Subdimension 5	6.50	1.96	0.00–9.00
Subdimension 6	6.13	2.32	0.00–9.00
Subdimension 7	6.84	1.94	2.00–9.00
Subdimension 8	5.71	2.13	0.00–9.00
MAS (<i>X</i> ₁)			
Characteristic 1	4.45	1.61	0.00–7.00
Characteristic 2	3.45	1.84	0.00–7.00
Characteristic 3	4.32	1.76	1.00–7.00
Characteristic 4	3.76	1.55	0.00–6.00
Characteristic 5	3.29	1.61	0.00–7.00
Characteristic 6	3.37	1.65	0.00–6.00
Characteristic 7	3.63	2.17	0.00–7.00
Characteristic 8	4.16	1.67	1.00–7.00
Characteristic 9	4.05	1.58	1.00–7.00
Budgetary participation (<i>X</i> ₂)			
Item 1	5.24	1.63	1.00–7.00
Item 2	4.82	1.56	1.00–7.00
Item 3	4.55	1.77	1.00–7.00
Item 4	5.32	1.45	1.00–7.00
Item 5	5.82	1.47	1.00–7.00
Item 6	5.13	1.63	1.00–7.00

*X*₁ = availability of MAS scope and timeliness information; *X*₂ = budgetary participation.

^a Mean of the overall score for each variable.

A correlation matrix for MAS, budgetary participation, and performance is given in Table 3. As expected, the correlation matrix shows that both MAS and budgetary participation are positively correlated to managerial performance with a significant positive correlation between MAS and budgetary participation as well.

3.2. Sample size and data collection

The sample consists of Chinese and Western subunit managers drawn from a cross-section of different manufacturing companies in Xian, China and Hong Kong, respectively. The managing directors and personnel managers of selected manufacturing companies were personally approached by the researchers to assist in questionnaire distribution to subunit managers of three large manufacturing enterprises in Xian, China and four large manufacturing enterprises in Hong Kong. A total of 124 questionnaires were distributed. Ninety-five questionnaires were returned with six unusable questionnaires representing a response rate of

Table 3
Correlation matrix^a

Variable	<i>Y</i>	<i>X</i> ₁	<i>X</i> ₂
Managerial performance (<i>Y</i>)	1.00		
MAS (<i>X</i> ₁)	0.28*	1.00	
Budgetary participation (<i>X</i> ₂)	0.50**	0.27*	1.00

*X*₁ = availability of MAS scope and timeliness information; *X*₂ = budgetary participation.

^a Based on all the summarized average scores.

* *P* < .01.

** *P* < .001.

72%. The mean age of the respondents was 40 (range 21–66) and mean experience was 17 years (range 1–39).⁶

3.3. Data analysis

To test the hypothesis, the following multiple regression model is employed (Eq. (1)):

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_1 X_2 + \beta_5 X_2 X_3 + \beta_6 X_1 X_3 + \beta_7 X_1 X_2 X_3 \quad (1)$$

where *Y* = managerial performance; *X*₁ = availability of MAS scope and timeliness information; *X*₂ = budgetary participation; *X*₃ = dummy variable for cultural background, 0 representing Chinese managers, 1 representing Western managers; *X*₁*X*₂, *X*₁*X*₃, *X*₂*X*₃, *X*₁*X*₂*X*₃ = interaction terms; *H*₁: $\beta_7 \neq 0$.

The multiplicative interaction term is expressed as the cross-product "... occurring between independent variables in their effect on the dependent variable" (Southwood, 1978, p. 1155). It is used to test the interaction effects of the availability levels of MAS, budgetary participation, and cultural background on managerial performance in the multiple regression model. If the β for the interaction term does not equal to 0, this implies that the interaction is significant. For a significant interaction, it is insufficient to examine only the interaction term because the algebraic sign of the interaction term only gives an indication of whether the effects are in the hypothesized direction (Gul & Tsui, 1995; Schoonhoven, 1981). A partial derivative equation is calculated from the main regression equation to determine the nature and direction of the interaction. Since the focus of this study is on the interaction effects between budgetary participation, MAS, and cultural background on managerial performance, the effects of the independent and moderating variables on the dependent variable individually need not be interpreted. The question of multicollinearity, which is common in multivariate models, is also a nonissue in this analysis⁷ (Govindarajan & Fisher, 1990; Gul & Tsui, 1995; Gupta & Govindarajan, 1989).

⁶ As shown in Appendix A, information on gender was not requested.

⁷ They argued that through a priori linear shifts in the origin points of *X*₁ and *X*₂, the correlations between *X*₁*X*₂ and both *X*₁ and *X*₂ can always be reduced to 0. Since it is mathematically proven that these represent mere shifts in the origin points of *X*₁ and *X*₂, they are meaningless and do not affect the information value of *X*₁*X*₂. As such, multicollinearity is a nonissue.

4. Discussion of results and conclusions

Panel A of Table 4 reports the regression results for two sets of equations based on average scores for the different variables. Equation A gives the regression results for MAS, budgetary participation, cultural background, and their two-way interactions on managerial performance. Equation B shows the results for the same regression with the addition of the three-way interaction term, which is significant ($\beta_7 = .51, P < .05$). With the introduction of the three-way interaction term, the adjusted R^2 significantly increases by 4%. The findings of both Equations A and B confirm that there is a significant three-way interaction between budgetary participation, MAS, and cultural background of the managers on managerial performance. Additional analyses are run using factor scores for each variable and results show that they are very similar (Gul & Chia, 1994).

The three-way interaction term, by itself, does not provide any information on the nature and direction of the relationships. In order to do this, the interaction term in the regression equation needs to be explained mathematically in terms of the partial derivative equation (Govindarajan, 1986). The partial derivative of Equation B in Panel A of Table 4 yields the following result:

$$\delta Y / \delta X_1 = 0.99 - 0.14X_2 - 3.10X_3 + 0.51X_2X_3 \quad (2)$$

Eq. (2) suggests that the effects of MAS on managerial performance is a function of budgetary participation and cultural background. In order to further analyze this interaction relationship for Chinese and Western managers, X_3 was set at 0 (for Chinese managers) and 1 (for Western managers) in the following two equations:

$$\text{Chinese Managers :} \quad (3)$$

$$\delta Y / \delta X_1 = 0.99 - 0.14X_2$$

$$\text{Western Managers :} \quad (4)$$

$$\delta Y / \delta X_1 = -2.11 + 0.37X_2$$

Eq. (3) suggests that for Chinese managers, the positive relationship between MAS and managerial performance decreases as budgetary participation increases. On the other hand, Eq. (4) suggests that for Western managers, low levels of budgetary participation is associated with a negative relationship between managerial performance and MAS, but this relationship becomes positive at high levels of budgetary participation.⁸

The evidence supports the hypothesis that the relationship between MAS and budgetary participation on managerial performance is different depending on the cultural background of the managers. The finding that there is a negative relationship between

⁸ These results are similar for Panels B and C of Table 4 based on factor scores.

Table 4

Panel A: Based on average scores. Regression results of MAS, budgetary participation, and cultural background on managerial performance ($N=89$)

Variables	Equation A	Equation B
MAS X_1	0.24 (0.45)	0.99* (0.53)
Budgetary participation X_2	0.23 (0.47)	1.00* (0.55)
Cultural background X_3	1.14 (1.36)	10.52*** (3.96)
Interaction term X_1X_2	0.04 (0.10)	-0.14 (0.12)
Interaction term X_2X_3	0.25 (0.27)	-1.70**
Interaction term X_1X_3	-0.55* (0.29)	-3.10*** (1.05)
Interaction term $X_1X_2X_3$	26%	0.51** (0.20)
Adjusted R^2	-	30%
F value	6.07***	6.44***

Panel B: Based on factor scores. Regression results of MAS (timeliness), budgetary participation and cultural background on managerial performance ($N=89$)

Variables	Equation A	Equation B
MAS X_1	0.26* (1.70)	0.17 (1.09)
Budgetary participation X_2	0.42*** (2.82)	0.49*** (3.36)
Cultural background X_3	-0.07 (-0.35)	-0.29 (-1.34)
Interaction term X_1X_2	0.12 (0.95)	-0.16 (-0.97)
Interaction term X_2X_3	0.23 (0.96)	0.33** (1.37)
Interaction term X_1X_3	-0.56* (-1.98)	-0.65** (-2.37)
Interaction term $X_1X_2X_3$	-	0.64** (2.59)
Adjusted R^2	23%	28%
F value	5.47***	5.97***

Panel C: Based on factor scores. Regression results of MAS (scope), budgetary participation and cultural background on managerial performance ($N=89$)

Variables	Equation A	Equation B
MAS X_1	0.41*** (2.78)	0.39*** (2.68)
Budgetary participation X_2	0.37** (2.53)	0.38*** (2.65)
Cultural background X_3	-0.02 (-0.12)	-0.08 (-0.41)
Interaction term X_1X_2	0.07 (0.51)	-0.06 (-0.43)
Interaction term X_2X_3	0.16 (0.75)	0.18 (0.82)
Interaction term X_1X_3	-0.37 (-1.53)	-0.59** (-2.21)
Interaction term $X_1X_2X_3$	-	0.54* (1.80)
Adjusted R^2	23%	28%
F value	6.28***	6.00***

Standard errors are in parentheses.

Adjusted R^2 explained by three-way interaction term = 4%.

X_1 = availability of MAS scope and timeliness information; X_2 = budgetary participation; X_3 = dummy variable for cultural background, 0 representing Chinese managers, 1 representing Western managers.

* $P < .10$.

** $P < .05$.

*** $P < .01$.

MAS and managerial performance at high levels of budgetary participation is therefore consistent with the cultural characteristics of Chinese society and Hofstede's (1991) cultural theory. In a large-power distance, high-collectivist, and long-term orientation society like China, high levels of budgetary participation in the presence of available management accounting information would not result in high managerial performance. However, consistent with Western theories underlying the motivational effects of participation, it was found that there is a positive relationship between MAS and performance for high levels of budgetary participation for Western managers. A significant implication of the results concerns the fact that management accounting theories developed in the Western context may not be generalizable to the Chinese environment. These results are also seen to be consistent with Otley's (1980) view that MAS and budgetary participation constitute an overall control package and are interdependent. More importantly, the application of this control package should also consider cultural differences. In order to implement control strategies successfully, organizational designers should consider these cultural factors.

Another implication of this study is that top management must recognize and proactively manage differences in culture. In designing management control systems, top managers of multinational corporations should be aware of the extent to which reward and evaluation systems and decision-making processes reinforce differences in culture.

This study is subject to the usual limitations of questionnaire survey methodology (Birnborg, Shields, & Young, 1990). Subjects were not selected at random and generalizing the results to other organizations should be viewed with caution. The use of respondents' perceptions to measure the variables has been criticized on the grounds that they are not objective. This is not a serious limitation since managers' actions and decisions are based on their perceptions. This study focused on budgetary participation, certain characteristics of MAS and performance measured in terms of managers' perceptions of their own performance. Other control tools such as decentralization and other types of MAS/AIS should be examined in future studies with different measures of performance such as job satisfaction. Moreover, the classification of cultural differences was based on Hofstede's (1991) analysis, and it may have been useful to retest the cultural dimensions of the respondents. These future studies should provide more evidence regarding the role of control tools and their impact on managerial performance in different cultural environments.

This study examined the theory that there is a difference between Chinese and Western managers' attitudes and behavior towards management control tools. In particular, this study tested the hypothesis that Chinese managers would not react positively to budgetary participation because of their cultural background. The partial derivative analysis showed that the positive influence of MAS on managerial performance for Chinese managers decreased at progressively higher levels of budgetary participation. On the other hand, for Western managers, at low levels of budgetary participation there was a negative relationship between MAS and managerial performance but progressively higher levels of participation were associated with a positive relationship between MAS and managerial performance. These results suggest that management

accounting theories developed in the Western economies may not be generalizable to the Chinese environment.

Appendix A. Research on managerial performance

This research aims to investigate the effects of MAS, budgetary participation, and managerial performance. The following questionnaire consists of four parts which measure your perceptions of these variables. Please answer all the questions following the instructions given. Completion of the questionnaire should not take more than 25 min of your time. All responses will be treated in the strictest confidence and only summarized results will be published. Your time and cooperation is very much appreciated.

Thank you.

A.1. Part A: Budgetary participation

The following items can be used to describe the role that you play in the development of the budget for your group. Please respond by circling a number from 1 to 7 on the scale for each of the following items.

- (a) Which category below best describes your activity when the budget is being set? I am involved in setting:

1	2	3	4	5	6	7
All of the budget						None of the budget

- (b) Which category below best describes the reasoning provided by your superior when budget revisions are made? The reasoning is:

1	2	3	4	5	6	7
Very sound and/or logical						Very arbitrary and/or illogical

- (c) How often do you state your requests, opinions, and/or suggestions about the budget to your superior without being asked?

1	2	3	4	5	6	7
Very frequently						Never

- (d) How much influence do you feel you have on the final budget?

1	2	3	4	5	6	7
Very high amount						None

(e) How do you view your contribution to the budget? My contribution is:

1	2	3	4	5	6	7
Very important						Very unimportant

(f) How often does your superior seek your requests, opinions, and/or suggestions when the budget is being set?

1	2	3	4	5	6	7
Very frequently						Never

A.2. Part B: Performance evaluation

Effective managerial performance may be regarded as depending on competence in the areas of managerial activity listed below. For each area of activity, please rate your own recent *performance* in each area.

Please respond by placing a number from 1 (*very low*) to 9 (*very high*) in the appropriate space to rate your own recent *performance* in each area. The following scale should be used for reference:

Performance:	Below average			Average			Above average			Performance (number from 1 to 9)
	1	2	3	4	5	6	7	8	9	

(a) *Planning*: Determining goals, policies and courses of action; work scheduling, budgeting, setting up procedures, programming. _____

(b) *Investigating*: Collecting and preparing information for records, reports and accounts, measuring output; inventorying, job analysis. _____

(c) *Coordinating*: Exchanging information with people in your organization in order to relate and adjust programs; advising and liaison with other personnel. _____

(d) *Evaluating*: Assessment and appraisal of proposals for reported or observed performance; employee appraisals, judging output records, judging financial reports; product inspection. _____

(e) *Supervising*: Directing, leading and developing your personnel; counselling, training and explaining work rules to subordinates; assigning work and handling complaints. _____

(f) *Staffing*: Maintaining the work force of your organization; recruiting, interviewing and selecting new employees; placing, promoting and transferring employees. _____

(g) *Negotiating*: Purchasing, selling or contracting for goods or services, contacting suppliers, dealing with sales representatives. _____

(h) *Representing*: Attending conventions, consultation with other firms, business club meetings, public speeches, community drives; advancing the general interests of your organization. _____

(i) *Overall Performance*: The following section of the questionnaire seeks some information relating to your firm’s performance in the recent past year. If you have no definite figures we would appreciate approximate figures.

Please indicate the intervals which best depict your enterprise’s performance by circling an appropriate number for questions (a) and (b).

(a) On average, the growth of sales revenue for the past 3 years is:

Below 10% 1	51–60% 6
11–20% 2	61–70% 7
21–30% 3	71–80% 8
31–40% 4	81–90% 9
41–50% 5	Above 90% 10

(b) On average, the growth of net profit before taxes the past 3 years is:

Below 5% 1	26–30% 6
5–10% 2	31–35% 7
11–15% 3	36–40% 8
16–20% 4	Above 45% 9
5% 5	

(c) What was the number of employees when the enterprise started? _____
 What is the number of employees at present? _____

(d) Which year did your enterprise start its operation? _____

A.3. Part C: Management accounting system

Listed below are nine information attributes. Two questions are addressed in relation to each of them.

To what extent do you believe your organization's MAS contains this information attribute?
Please circle the relevant number on each of the seven-point scales below your perceptions.

(a) Reports are provided frequently on a systematic, regular basis	Small extent	Great extent	Not applicable
	1 2 3	4 5 6	7 8 9
(b) Information which relates to possible future events (if historical information is most useful for your needs, mark the lower end of the scale).	Small extent	Great extent	Not applicable
	1 2 3	4 5 6	7 8 9
(c) <i>Nonfinancial</i> information that relates to production and market information such growth share etc. (if you find that a <i>financial</i> interpretation of marketing information is most useful for your needs, please mark the lower end of the scale).	Small extent	Great extent	Not applicable
	1 2 3	4 5 6	7 8 9
(d) Requested information to arrive immediately on request.	Small extent	Great extent	Not applicable
	1 2 3	4 5 6	7 8 9
(e) Quantification of the likelihood of future events occurring (e.g., probability estimates).	Small extent	Great extent	Not applicable
	1 2 3	4 5 6	7 8 9
(f) There is no delay between an event occurring and relevant information being reported to you.	Small extent	Great extent	Not applicable
	1 2 3	4 5 6	7 8 9
(g) Noneconomic information, such as customer references, relations, attitudes of government and consumer bodies, competitive threat.	Small extent	Great extent	Not applicable
	1 2 3	4 5 6	7 8 9
(h) Information on broad factors external to your organization, such as economic conditions, population growth, technological developments, etc.	Small extent	Great extent	Not applicable
	1 2 3	4 5 6	7 8 9

(i) Information supplied to you automatically upon its receipt into information systems or as soon as processing is completed.	Small extent			Great extent			Not applicable		
	1	2	3	4	5	6	7	8	9

A.4. Part D: Background

All responses will be treated in the strictest confidence and only summarized results are published.

(a) Name of your enterprise:

(b) Nature of your business:

(c) What position do you hold in your enterprise?

(d) How many years of *total* working experience?

(e) How many years have you held this position?

(f) Date of birth:

Thank you.

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Pergamon

The International Journal of Accounting
36 (2001) 147–167

The
International
Journal of
Accounting

Accounting for brands in France and Germany compared with IAS 38 (intangible assets): An illustration of the difficulty of international harmonization

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Abstract

This paper compares the positions taken by IAS 38 over brands and the related treatments in France and Germany. Despite many points of convergence, the paper shows that these two countries, often to be found in the same cluster of national accounting systems (the “Continental-European” model), have adopted very different solutions in relation to each other and to IAS 38. The results of the study highlight the difficulty of international harmonization. They also show that as far as the qualitative characteristics of accounting are concerned, the frequently made association between Anglo-American accounting philosophy and “relevance,” and between Continental-European accounting philosophy and “reliability,” may not apply when it comes to brand accounting. To resolve this international “disharmony,” our paper militates in favor of disclosure of additional information. © 2001 University of Illinois. All rights reserved.

Keywords: Brands; International accounting standards; IASC; Intangible assets; International harmonization

1. Introduction

Intangibles have become an increasingly important factor in economic life and the success of corporate activities (Duizabo & Guillaume, 1996; Ochs, 1996). For the majority of

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companies, intangibles are essential for progress and a considerable part of the corporate value. One type of the very broad spectrum of corporate intangibles is brands. Brands can be defined as any word, tone, symbol or design to identify and distinguish one product or group of products from other products (Plasseraud, Plasseraud, & Dehaut, 1994). However, brands are more than just the name or sign. In a broader sense, they create a unique image of the branded product or service, its quality and attributes as perceived by customers (Meffert & Burmann, 1998, p. 81; Smith, 1997, pp. 38–44; see also Kapferer, 1998). In the consumer product industry particularly, they are regarded as a key competitive factor influencing consumer preferences for a product and, therefore, the corporate sales level.¹

Because of the importance of brands for the economic development of certain businesses, their accounting treatment has been a matter of debate and controversy in many countries, for example, in Australia and the United Kingdom, where companies such as Grand Metropolitan and Rank Hovis McDougall decided in 1988 to include the value of brand names, either purchased or internally developed, in their consolidated balance sheets (among others see Barwise, Higson, Likierman, & Marsh, 1989; Power, 1992). In France, too, the consequence of accounting for intangible assets, including brands, is important for certain companies because of their potential relative significance in the presentation of the balance sheet. For example, in 1998, brands represented 22.8% of the balance sheet total for “Rémy Cointreau” and 11.9% for “Danone” (X, 1999a). The most remarkable transaction concerning brands in Germany was the acquisition of the “Rolls-Royce” and “Bentley” brands by BMW and VW in 1998. For Beiersdorf there is an assumption that the “Nivea” brand is more valuable than the balance sheet total (Breit, 1997).

Against this background, the International Accounting Standards Committee (IASC) issued its International Accounting Standard 38 in July 1998 (IAS 38, intangible assets, see Gélard, 1998; IASC, 1998b), following the publication of two Exposure Drafts (E50, June 1995, see Gélard, 1995; IASC, 1995; X, 1995a, 1995b and E60, August 1997, see IASC, 1997). The standard sets out proposals for the recognition, measurement, amortization, and disclosure of intangible assets. Accounting treatment of brands is included in the scope of this text.

It is often stressed that the process and outcome of IASC standard setting are very much influenced by the Anglo-American accounting approach, which theoretically emphasizes “relevance.” This is considered one of the major reasons why countries with other accounting approaches are clearly reluctant to adopt the international accounting standards. That is particularly true of countries belonging to the “Continental-European conception,” which is supposed to stress reliability, objectivity, and prudence in income calculation. It is thus highly interesting to examine whether the treatment described in IAS 38 differs from accounting practice in Continental-European countries, and to consider if the content of the standard could easily be adopted by enterprises in those countries. This is the main objective

¹ An empirical study (sample of 400 companies) carried out in Germany indicates that more than 80% of managers are convinced that the importance of brands has increased considerably during the last few years. At the same time, taking all industries together, brand values represent on average 56% of the market values of German companies (Wermelkirchen, 1999).

of our paper, which compares the positions taken by standard IAS 38 over brands with the related treatments² in two countries not often studied together: France and Germany.

The remainder of our paper proceeds as follows. The next section presents the recognition of brands as an asset, covering such fundamental problems as the definition of intangible assets, the principles governing the recognition of brands (acquired or self-generated) and initial measurement of brands. Section 3 describes the subsequent measurement (amortization, revaluation, and value recovery) and Section 4 suggests some limitations of our study and directions for future research. Section 5 presents the conclusions.

2. Recognition of brands as an asset and initial measurement

Because brands are intangible items, their recognition on the balance sheet primarily depends on their compliance with the definition of intangible assets. The classification of intangibles as assets is therefore the preliminary step in our investigation.

2.1. Definition of intangible assets

IAS 38 (para. 7) defines an intangible asset as an “identifiable nonmonetary asset without physical substance held for use in the production or supply of goods or services, for rental to others, or for administrative purposes.” An asset “is a resource (a) controlled by an enterprise as a result of past events; and (b) from which future economic benefits are expected to flow to the enterprise.” The standard indicates (IAS 38, para. 8) that “enterprises frequently expend resources, or incur liabilities, on the acquisition, development, maintenance or enhancement of intangible resources such as . . . trademarks (including brand names and publishing titles).” Not all intangible items meet the characteristics of an intangible asset, that is, “identifiability, control over the resource and existence of future economic benefits” (IAS 38, para. 9).

IAS 38 requires an intangible asset to be “identifiable to distinguish it clearly from goodwill” (para. 10), which is the case “if the asset is separable” (para. 11). Separability exists “if the enterprise could rent, sell, exchange or distribute the specific future economic benefits attributable to the asset without also disposing of future economic benefits that flow from other assets used in the same revenue earning activity” (para. 11). But it may also be possible to prove the identifiability of an asset in some other way (see IAS 38, para. 12). IAS 38 assumes that “an enterprise controls an asset” if it “has the power to obtain the future economic benefits flowing from the underlying resource and also can restrict the access of others to those benefits” (para. 13). Future economic benefits may “include revenue from the sale of products or services, cost savings, or other benefits resulting from the use of the asset by the enterprise” (para. 17).

The definition and explanations given by IAS 38 are much more detailed than German and (particularly) French texts on the subject. In Germany, intangible assets, like tangible assets, are not legally defined. The general definition of an asset, derived in German accounting tradition

² The notion of “treatments” comprises accounting rules, principles, and company practices.

from the “principles of proper accounting” (*Grundsätze ordnungsmäßiger Buchführung*) and the purposes of financial accounting, in fact applies to tangibles as well as intangibles. Thus, intangible assets are all items that correspond to the general asset definition, and are fixed but not tangible (i.e., without physical substance) or financial (Haller, 1998, p. 564). The major formal difference compared to the IASC definition is that the German definition does not explicitly stress the characteristic of a “future economic benefit.” It speaks about an “economic value” inherent to an item, and this generally but not necessarily implicitly incorporates the idea of a future economic benefit (Hommel, 1997, p. 352; Moxter, 1986, pp. 246–247). The two predominant components of the German asset definition are quite similar to the IASC approach, in that an asset must be identifiable and independently and reliably measurable (Baetge, 1996, pp. 148–155; Haller, 1998, p. 575; Hommel, 1997). Identifiability means that the item can be separated from the business and its economic benefits can be disposed of separately in any form. Thus, in terms of separability of the item from the enterprise, and its independent and reliable measurability, the definition of intangible assets in Germany is quite similar to that given by the IASC (Haller, 1998, p. 575; Hommel, 1997, p. 363).

In France, however, the General Accounting Plan (*Plan comptable général*) 1982 (CNC, 1986, I.33; Orsini, Gould, Mc Allister, & Parikh, 1998) defines intangible assets as being fixed assets other than tangible or financial assets, with a fixed asset being defined as an asset acquired for long-term use in the operation of the business. The general definition of an asset is “. . . an element of net worth which has a positive economic value for the firm.” (The concepts of “identifiability” and “separability” are not dealt with). Therefore, intangible assets are recognized only by comparison with tangible assets, which correspond to real rights over tangible objects. The new version of the General Accounting Plan, dating from 29 April 1999 (X, 1999c), no longer provides a definition of intangible assets. However, the general opinion is that the definition given in 1982 is still valid.

It could therefore be claimed that the German and French definitions of intangible assets are not in contradiction with the IAS 38, but are simply less specific. Nevertheless, they are not totally comparable because of the differences in the general asset definition regarding the characteristic of “future economic benefits” (see Table 1).

2.2. Principles for recognition of brands

In IAS 38 (brands are mentioned on several occasions, most importantly in the overall definition of intangible assets), and also the accounting rules in France and Germany, brands are regarded as a type of intangible item whose recognition could become possible or even necessary.

Table 1
Definition of intangible assets

IAS 38	France	Germany
Identifiable, nonmonetary assets without physical substance	Fixed assets other than tangible or financial	No legal definition. In practice: fixed assets other than tangible or financial

IAS 38 has made a considerable effort to clarify matters by indicating (para. 18) that an intangible item should be recognized as an asset if it “meets the definition of an intangible asset” mentioned above, plus two additional “recognition criteria set out in the Standard”:

- (a) “it is probable that the future economic benefits that are attributable to the asset will flow to the enterprise”; and
- (b) “the cost of the asset to the enterprise can be measured reliably” (para. 19).

Before looking into the possibilities for recognizing brands in France and Germany, we should remember that Articles 9 and 10 of the Fourth Directive, No. 78/660/EEC of 25 July 1978, stipulate that, in order to be included in balance sheet assets, brands should be:

- either “acquired for valuable consideration and need not be shown under goodwill”;
- or “created by the undertaking itself, in so far as national law permits their being shown as assets” (EEC, 1978, Article 9 C.).

This European Directive lacks precision and therefore leaves European Union countries considerable scope for initiative. In France and Germany, this part of the Directive was turned into a simple rule concerning the format of the balance sheet. Although France goes so far as to cite brands in the balance sheet headings for intangible assets, they are not explicitly mentioned in the corresponding balance sheet position under German rules (HGB -*Handelsgesetzbuch* (Commercial Code) – para. 266 [2]), but they are covered as they belong to the term *gewerbliche Schutzrechte* (industrial property rights), which are mentioned in the national rule.

Looking at the conditions of recognition in more detail, differences between the three regarded sets of rules become obvious.

2.2.1. Probability of future economic benefits

According to IAS 38 (para. 20), “an enterprise should assess the probability of future economic benefits by using reasonable and supportable assumptions that represent management’s best estimate of the set of economic conditions that will exist over the useful life of the asset.” In Germany, as already mentioned, future economic benefits are not explicitly referred to in the intangible asset definition. In France, the same applies for individual financial statements. However, the new regulation on consolidated accounts (X, 1999b, para. 2111) includes the requirement of future economic benefits.

2.2.2. Reliable measurement of cost

Brand value, as a key management responsibility, should be assessed, monitored, maintained, and enhanced for the following reasons: (1) maximization of shareholder value through maximization of brand value, (2) estimation of the value of a company in the context of mergers and acquisitions, (3) determination of royalties for brands, and (4) for accounting purposes. While many companies include brands on balance sheets, many also charge subsidiaries for access to and use of brands (e.g., Nestlé), and many companies are acquired as much for their brands as for their tangible assets (e.g., Nabisco, Jaguar). Brands must also

be valued because they are increasingly the subject of litigation. The more valuable they are perceived, the more companies are prepared to spend to defend their values. One role of assessing the value of brands is to convince the courts of the gravity of the offense and to help the court assess the damage in settlement.

Besides the need to identify the asset, the key issue in brand valuation is the selection of an appropriate valuation method, which is based on a subjective process emphasizing economic benefits. Various valuation methods are discussed and proposed in literature and used in practice. In general, these methods can be divided into three approaches: the cost approach (historical cost method or replacement cost method), the income approach (namely the royalty-relief method, and all types of discounted cash-flow and earnings methods), and the market approach (comparison with other transactions) (see among others Barwise et al., 1989, pp. 53–76; Haigh & Perrier, 1997; Kahn, 1997; La Villeguérin, 2000/2001; Medus, 1990; Nussenbaum, 1991; Reilly & Schweihs, 1998, pp. 426–433; Roeb, 1994, pp. 80–133; Sattler, 1995; Smith, 1997; Viale, 1991).

In practice, the accounting policy followed for brand recognition and, in particular, the choice of a valuation method, depends on the way the brands have been obtained by the enterprise: separate acquisition (including acquisition without charge or by exchange), acquisition as part of a business combination (mergers or acquisition of subsidiaries), or internal generation.

2.2.2.1. Separate acquisition. According to IAS 38 (para. 23), “if an intangible asset is acquired separately,” its cost “can usually be measured reliably.” This is particularly so when the purchase consideration is in the form of cash or other monetary assets.” When a brand is acquired by exchange (or as part of an exchange) with another asset (tangible or intangible), it must be measured at its fair value, “which is equivalent to the fair value of the asset given up adjusted by the amount of any cash or cash equivalents transferred” (IAS 38, para. 34).

In France, brands acquired for a consideration are treated as intangible fixed assets and as such are recorded under the heading *Concessions et droits similaires, brevets, licences, marques, procédés, logiciels, droits et valeurs similaires* (Concessions and similar rights, patents, licenses, brands, processes, software, rights, and similar assets). Like all other assets, the value recorded is the acquisition cost paid (La Villeguérin, 2000/2001; Viale & Lafay, 1990). An asset acquired by way of an exchange should be recognized at its market value, which is the price that would have been paid under normal market conditions (i.e., in an arm’s-length relationship). Measurement of acquired brands is therefore similar under IAS 38 and French rules. Furthermore, the National Accounting Council (*Conseil national de la comptabilité, CNC*), the standard-setting body attached to the Ministry of Economy and Finance, set up a committee to work on brands in 1990–1991. This committee issued a report (CNC, 1992) in April 1992: it refers to acquired brands without discussing their recognition and measurement.

In Germany, until the adoption of the *Markengesetz* (MarkenG, Brands Act of October 25, 1994), it was not possible to sell a brand separately, but only with the whole enterprise or with the business of an enterprise possessing the brand. Today, a brand itself can be sold separately without any connection to the sale of the whole enterprise or parts of it (MarkenG, para. 27).

Because reliable cost measurement is the predominant requirement for recognition of an intangible asset, recognition depends on the acquisition being for a consideration, which gives a reliable indication for measurement. Therefore, a brand, like all other intangible assets, must be recognized at acquisition cost if it has been acquired for a consideration (Coenberg, 1996, pp. 83; Keitz, 1997, pp. 66–68). Brands acquired by way of exchange can be initially measured either at the fair value of the asset given up or at its carrying amount (Knop & Küting, 1995, pp. 1047–1048).

In the event of separate acquisition of a brand, IAS 38 and both French and German accounting rules require initial measurement of the brand to be based on the acquisition cost, and so only the historical cost approach is appropriate. The definition of acquisition cost is similar in the three sets of rules. It comprises purchase price, including any import duties and nonrefundable purchase taxes, and any directly attributable expenditure on preparing the asset for its intended use. There is only one difference, relating to the treatment of professional fees and legal charges, which are not included in France. With regard to brands acquired by way of exchange, the three sets of rules are similar.

2.2.2.2. Acquisition as part of a business combination (merger or consolidated financial statements). IAS 38 (para. 27–32) covers the treatment of intangibles acquired as part of a business combination as defined in IAS 22 (IASC, 1998a). In this context, the cost of an intangible asset “is based on its fair value at the date of acquisition” (IAS 38, para. 27). Judgement is needed to determine whether the fair value of the intangible asset can be ascertained with sufficient reliability. In such cases, IAS 38 (para. 28) states that “quoted market prices in an active market provide the most reliable measurement of fair value.” “If no active market exists for an asset, its cost reflects the amount that the enterprise would have paid, at the date of the acquisition, for the asset in an arm’s length transaction between knowledgeable, and willing parties, based on the best information available” (para. 29). IAS 38 also cites several other methods to estimate the fair value, e.g., multipliers or discounted cash flows (IAS 38, para. 30), and concludes, “if the cost (i.e., fair value) of an intangible asset . . . cannot be measured reliably, that asset is not recognized as a separate intangible asset but is included in goodwill (IAS 38, para. 31-b).”

Because it is usually difficult to arrive at separate evaluations of brands acquired as part of a business combination, then as we understand IAS 38, the first consolidation will only seldom lead to separate recognition of a brand because of the lack of sufficient reliability in measurement (see also Harding, 1995, p. 9). IAS 38 actually leaves companies the option of whether to separate the brand or to include it in goodwill. Additionally, the Basis for Conclusions for IAS 38, para. 37-b (IASC, 1998c), a separate document prepared by the IASC Staff giving their reasons for supporting or rejecting alternatives on certain specific issues, does not explicitly require an active market for an intangible asset to be separated from goodwill in a business combination and measured at fair value. In the final analysis, as the treatment of goodwill is consistent with that of intangible assets, separate recognition of brands is only a question of disclosure and additional information and has no material impact on net income (at least as long as amortization is the same for goodwill and brands) (IASC, 1998c, para. 57–59).

The Fourth (EEC, 1978) and Seventh European Directives (EEC, 1983) do not include any explicit advice on how to treat intangible assets acquired through a merger or with a subsidiary. Implicitly, however, it can be concluded that such assets, if identifiable, should be recognized and measured separately.

The position taken by the IASC differs slightly from French rules and practice. In France, when an enterprise is first included in consolidated accounts, brands may be capitalized in recording the difference between the cost of acquiring a company and the proportion of the net assets acquired, including profits for the accounting year to date. This difference comprises two elements: firstly, the positive or negative valuation differences on certain identifiable assets when restated at fair value, and secondly, a remainder, which cannot be allocated, called the “acquisition difference” (goodwill). With respect to valuation differences, the National Accounting Council specifies, in an Opinion dated January 15, 1990 (CNC, 1990), that “among these identifiable elements should be included intangible assets, which have not been included in the individual company accounts: commercial networks, market shares, databases, etc.” The CNC opinion does not mention brands specifically, but commentators (and French companies) made two remarks following the publication of the Opinion:

- logically, it is possible to argue that brands are more easily identifiable than market shares, which are explicitly mentioned in the Opinion;
- the presence of the “etc.” at the end of the sentence leaves the list open to additional items.

Consequently, in practice a certain number of French companies allocate a part of the difference on first consolidation to brands. In fact, according to the annual review by a group of accounting firms of published annual reports for 1998 (X, 1999a), 48 of the hundred groups reviewed allocate a part of the consolidation difference to brands, and in some cases the brands concerned amount to more than 20% of the balance sheet total.

To confirm the analysis of the 1990 Opinion by commentators, the new regulation on consolidated financial statements (X, 1999b, para. 2111) explicitly quotes brands in the list of identifiable intangible assets, thus clearly saying that brands can be recognized as assets within the context of a business combination.

As far as the valuation of brands is concerned, several methods exist side by side, as presented in literature and more particularly in the National Accounting Council report (CNC, 1992). Methods based on the capacity to generate future cash flows (or profitability methods) can be used to value a brand in the context of a merger or the first consolidation of an acquisition, in order to separate the valuation difference into identifiable components. The royalty-relief method is the most standard approach and, if applicable, the most often used for brand valuation in France (La Villeguérin, 2000/2001).

In Germany, if the acquisition cost is higher than the proportional net asset value of the acquired subsidiary, the difference on first consolidation must be allocated between the various assets, or offset against certain liabilities of the acquired company (HGB, para. 301 al. 1, s. 3). The portion of the consolidation difference that cannot be allocated to specific assets

has to be treated as goodwill (*Geschäfts- und Firmenwert*) (HGB, para. 268 al. 2) and recorded under the balance sheet heading of intangible assets.

Under the generally accepted principles, there is certainly no option on separate recognition of brands, since it is either obligatory (HGB, para. 246, al. 1) or forbidden (HGB, para. 248 al. 2). If the purchased company possesses (internally generated) brands, the acquiring company must recognize the brand in its balance sheet if there is a reliable basis of measurement (Rohnke, 1992; Stein & Ortman, 1996, p. 788). Because of the difficulties mentioned above in determining identifiable intangibles and measuring them reliably, the majority of German companies include the vague amount corresponding to intangibles acquired with a subsidiary in goodwill. Nevertheless, some authors refer to a possible price arrangement for specific items in the contract of sale or in the underlying valuations, which might be a value indication (Richter, 1990, p. 23), while some also list several of the abovementioned methods for brand valuation and give practical advice for their use (Rohnke, 1992).

While France believes that measurement of brands is sufficiently reliable, the IASC and Germany have concluded otherwise. How can this difference be explained? One answer could be France's long tradition and a great amount of literature dealing with the valuation of brands. Therefore, the reliability argument is not considered an obstacle to putting "relevance" first. Another reason relates to the fact, already referred to, that separability is not a specific characteristic in the French definition of an asset. Therefore, there is no need to comply with a "separability" or "identifiability" requirement in recognizing a brand. A more practical reason for the transfer from goodwill to brands of part of the difference on first consolidation could be the positive effect on income for French companies, as brands are regarded as nonamortizable³ (see below, Section 3).

2.2.2.3. Internal generation. As IAS 38 (para. 39) points out, "it is sometimes difficult to assess whether an internally generated intangible asset qualifies for recognition." The standard indicates that, with regard to intangible assets "arising from development (or from the development phase of an internal project)," special conditions that give more concrete guidance for recognition must be met (para. 45, a–f). They are "the technical feasibility of completing the intangible asset so that it will be available for use or sale," the "intention to complete the intangible asset and use or sell it," "the ability to use or sell the intangible asset," the demonstration of probable future economic benefits, "the availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset" and the "ability of the enterprise to measure the expenditure attributable to the intangible asset during its development reliably."

Most surprisingly, without taking into account whether the concrete conditions are fulfilled or not, IAS 38 (para. 51) states specifically that "internally generated brands . . . should not be recognized as intangible assets." This is because the IASC believes "that expenditure on

³ This reasoning is in conformity with the experience of the UK before FRS 10 (ASB, 1997) was adopted. The treatment of brands was in practice affected by considerations concerning its effect not on taxable income but on critical accounting ratios (Muller III, 1999).

internally generated brands . . . cannot be distinguished from the cost of developing the business as a whole” (IAS 38, para. 52). With this concrete prohibition, the IASC is taking a very prudent point of view that stresses reliability.

In principle, the French viewpoint is opposed to the IAS, but in practice, it conforms to it. The General Accounting Plan even includes a specific balance sheet heading to record “expenses incurred to obtain the benefit that comes from the protection afforded . . . to the beneficiary of the operating rights . . . to a brand” (CNC, 1986, I.25; X, 1999c, para. 441). Based on a broad interpretation of this heading, enterprises could include self-generated brands in their balance sheets. However, in practice, French companies do not recognize internally generated brands as assets. The major arguments against it are the high degree of uncertainty as to the nature of expenses that can be capitalized, and the impact on taxable income, given the close interdependence of financial accounting and taxation in France.

The first of these arguments against recognition is highly debatable, especially as the CNC report (CNC, 1992) states that an intangible item developed internally by an enterprise should be included in the balance sheet fixed assets if:

- it is possible to demonstrate, with reasonable probability, that the item is capable of generating future economic benefits in favor of the enterprise;
- it is intended to be used durably in the enterprise;
- and its cost can be calculated in a reliable way, with the help of a specific individual project.

The CNC report, modeled on the measures adopted in the CNC opinion on computer software (CNC, 1987), undertakes an in-depth study of the process of brand creation and proposes step-by-step solutions for recording a brand as an asset, based on the different stages of this process. All the reasoning is based on the concept of a “project,” where the following seven criteria must be met to record the output (brand) as an asset:

1. Specification of the output (brand) (answer to the question: what?);
2. Identification of the process to develop this output (brand) (answer to the question: how?);
3. Allocation of human, financial, commercial . . . means (resources) to the project (answer to the question: with what resources?);
4. Implementation of management tools to control the process, in order to (a) measure the cost of the brand created, (b) match the expenses to the different steps of the project, (c) evaluate, at each step, the probability of commercial success or failure (answer to the question: with what control tools?);
5. Explicit commitment to produce the output (use the brand) whose development is in process;
6. Reasonable probability of generating future advantages (commercial profitability);
7. Long-term use of the output produced (brand created).

If Criteria 1 to 5 are satisfied, we have a real “project.” If Criteria 1 to 5 plus 6 and 7 are satisfied, the output (brand) can be capitalized. The report goes on to describe the different

phases of development of a brand and explains when (at which phase) the brand can be recorded as an asset.

For determining the production cost of a brand produced by the enterprise for its own use, current accounting discussion in France has concluded that this method is:

- reliable, through use of the project concept applied to the brand creation process (see above);
- relevant, according to the CNC (1992), particularly for valuing a recent brand with a serious chance of commercial profitability but which has not yet attained its full maturity.

This production cost method leads to separate valuation of the brand, and the result is relatively objective in the way it is determined (project) and consistent with the standard accounting measurement approach based on costs. Unfortunately, the CNC report has never been turned into a standard, probably because of the taxation effect already mentioned.

We have not discovered any official indications in Germany of a similar reflection to that undertaken in France concerning the recognition of self-generated brands. On the contrary, in Germany, the recognition of internally generated noncurrent intangible assets is illegal because of the lack of sufficient reliability of measurement (HGB, para. 248, al. 2; Adler, Düring, & Schmaltz, 1995, No. 23 to HGB, para. 248). Without any doubt, brands are covered by this ban.

The ideas contained in the CNC report are very interesting and show that, contrary to what is affirmed in IAS 38, solutions exist to calculate the cost of internally generated brands. It may seem surprising to find a method that is considered both reliable and relevant in France, although the IASC and Germany believe that reliability is impossible in the field of internally generated brands, especially given that the criteria (Steps 1 to 7) proposed by the CNC are quite close to the requirements indicated in IAS 38 (para. 45). We do not think that the French proposal is less rigorous than systems applied elsewhere, or that French “specialists” are somehow “cleverer.” We believe that the cultural weight of “reliability” is very important elsewhere and that the French proposal still includes assumptions that leave it open to criticism and discourage other countries from following its lead.

3. Measurement after initial recognition

When brands are recognized separately, their value must be examined at the balance sheet date. This may result in (1) amortization, (2) revaluation, or (3) a possible write-down or write-up.

3.1. General reflections on brand amortization

There is considerable discussion about whether a brand should be subject to amortization at all, and how to determine its useful life. The main arguments against a definite useful life, and therefore against amortization of brands, are as follows:

- In many countries the legal protection of brands is unlimited, or at least renewable indefinitely (e.g., for Community Trademarks within the European Union, in France, Germany, and the USA). Hence from a legal point of view, the use of a brand is not limited for its owner.
- Some brands are very old, sometimes reaching 150 years in certain sectors: in France, for instance, 150 years for champagnes such as “Moët,” or cognacs like “Martell” and “Rémy Martin”; 100 to 150 years for mineral water (“Evian,” “Vittel,” “Badoit,” etc.); 50 to 100 years for spaghetti (“Lustucru”), chocolate (“Lanvin”), and pastis (“Ricard”) (CNC, 1992). Other examples of “old” brand names are “The Times,” “Coca-Cola,” and “Walt Disney.” Although the useful life cannot be known with certainty, particularly in advance, age is an *ex post facto* proof of a long economic life.
- Some authors argue that the value of a brand is maintained or even increased by huge advertising expenses, which are recognized as expenses and do not therefore justify amortization or a limitation of the useful life. In a similar situation, the useful life of tangible assets would be estimated based on the assumption of regular maintenance. In addition to this, amortization of the brand would result in double impact on the profit margins (amortization and maintenance) (Harding, 1997, pp. 81–84; Pizzey, 1991, p. 26).
- There are no doubts about the possibility of a brand value declining, but there are doubts about the regularity of the decline. Consequently, brands should be subject to write-downs if necessary but not to regular amortization (Smith, 1997, pp. 104–123; Wild & Scicluna, 1997, pp. 94–96).

Those in favor of amortization and a limited useful life for brands put forward the following responses to these arguments:

- For the purposes of financial accounting, the economic approach is more relevant than a legal point of view (Barth & Kneisel, 1997, p. 474). Although the legal right to use a brand might last indefinitely, the ability to achieve future economic benefits from this brand is what settles the question of amortization and useful life. It is not the legal aspect of a brand that creates future economic benefits but the higher sales of products, the stabilized connections between customers and the branded products, and the savings on advertising expenses (Barwise et al., 1989, pp. 29–32; Gold, 1998, p. 958; Meffert & Burmann, 1998, p. 87; Stein & Ortmann, 1996, p. 790). Brands are closely connected with the product sold under the brand. But products, their technology, customer expectations, and market conditions change constantly. So if the brand is not supported by management action to anticipate or oppose these changes, the value of the brand diminishes quickly (this conclusion has been reached from several different perspectives, see Barwise et al., 1989, pp. 32–38; Meffert & Burmann, 1998). The question raised by this argumentation is whether, from this point of view, the brand is still an identifiable and separable asset, or whether it is in fact too closely connected to the products or services to allow separate recognition.
- The expenses incurred to maintain a brand, e.g., advertising costs, are not an argument in favor of an indefinite life. The value of a brand is a certain customer connection that

leads to higher sales. With time this connection loses strength, then advertising creates new customer connections. So even when sales levels are constant, they are in fact different in substance from the original sales. This line of thought thus concludes that the purchased brand is eventually replaced by an internally generated brand, which should not be recognized as an asset (Barth & Kneisel, 1997, pp. 476–477; Boorberg, Strüngmann, & Wendelin, 1998, p. 1115).

- Just as there seem to be examples of brands always keeping their value, there are also brands that have vanished, like “Steinhäger” (spirit), “Simca” and “Triumph” (cars) (Harding, 1997, p. 82; Stein & Ortmann, 1996, p. 791).

In the end, the debate over brand amortization is based on how we understand the function of amortization. If amortization should reflect current value, there seem to be more objections than reasons for its application; if amortization is to distribute the recognized amount over a limited time, there are more arguments in favor of regular amortization (Barth & Kneisel, 1997, p. 474). The rules of the IASC, France, and Germany clearly reflect this discrepancy.

3.2. Amortization of brands under IAS, French, and German accounting rules

According to IAS 38 (para. 63), “after initial recognition, an intangible asset should be carried at its cost less any accumulated amortization and any accumulated impairment losses.” Later, the standard states (para. 79) that “the depreciable amount of an intangible asset should be allocated on a systematic basis over the best estimate of its useful life” and that “there is a rebuttable presumption that the useful life of an intangible asset will not exceed 20 years.” In the case of control “achieved through legal rights that have been granted for a finite period,” the standard adds that “the useful life of the intangible asset should not exceed the period of the legal rights unless: (a) the legal rights are renewable and (b) renewal is virtually certain” (para. 85). However, because of the existence of economic factors, “the useful life is the shorter of the periods determined by” economic and legal “factors” (para. 86).

Moreover, “in rare cases, there may be persuasive evidence that the useful life of an intangible asset will be a specific period longer than 20 years. In these cases, the presumption that the useful life generally does not exceed 20 years is rebutted and the enterprise (a) amortizes the intangible asset over the best estimate of its useful life; (b) estimates the recoverable amount of the intangible asset at least annually in order to identify any impairment loss...; and (c) discloses the reasons why the presumption is rebutted and the factor(s) that played a significant role in determining the useful life of the asset” (para. 83).

The idea that the asset may never be amortized is explicitly mentioned, as the standard adds that “the useful life of an intangible asset may be very long but it is always finite” (para. 84).

Article 35 of the Fourth European Directive of 1978 (para. 1. b) stipulates that “the purchase price or production cost of fixed assets with limited useful economic lives must be reduced by value adjustments calculated to write off the value of such assets systematically over their useful economic lives.” This article gives a general definition of depreciation. However, the Directive does not provide any special guidance for brands, in contrast to

formation expenses (article 34) and costs of research and development (article 37, para. 2). Once again, member states enjoy the widest latitude in dealing with brand amortization.

In France, the depreciable nature of brands was the subject of considerable debate in the report on brands mentioned above (CNC, 1992), due to a lack of clarity in the General Accounting Plan. The Plan seems (implicitly) to exclude amortization of acquired brands, because they are not mentioned in the asset subheading “Amortization of concessions, patents...” whereas they are included in the asset heading “Concessions, patents... brands...” At the same time, a write-down expense is allowed, if necessary: the asset subheading “Write-down (provision) expense for intangible assets: concessions...” includes brands explicitly. Considering matters from a conceptual point of view, the CNC report added that there is no irreversible amortization of a brand, and so it concluded that a brand (acquired or internally generated) should not be amortized. Instead, a regular test of impairment should be implemented.

In Germany, recognized intangible assets, with the exception of the acquired goodwill, have to be amortized over their useful life. In this country, recent discussions dealt with the question of whether a brand has a determined useful life and, if so, what the appropriate period is for financial accounting purposes. In 1996, the federal court for tax affairs (*Bundesfinanzhof*) ruled that there is no reliable estimation for a specific limitation of the useful life and amortization of brands: therefore, brands should not be subject to amortization. In reaction, the ministry of finance took a contrary position in 1998, declaring that it generally supposes a useful life for brands to be 15 years (the same as for goodwill) if the owner cannot justify a shorter period. Since accounting for tax purposes and financial accounting are closely connected in Germany (see Haller, 1992), these statements are in fact relevant for financial accounting, too.

Since the decision of 1996, several comments have been published in literature (see among others Barth & Kneisel, 1997; Boorberg et al., 1998). Nearly all authors criticize the decision of the federal court; in doing so they put forward a range of arguments (most of them included in the list above), and recommend amortization of brands (exception: Fick, 1997). Even the presumption of 15 years is considered too long. Instead, a useful life of between 3 and 5 years is proposed. This shorter period is justified by the prudence principle, as there is no reliable measurement, or by reference to life cycles (Meffert & Burmann, 1998, pp. 96–118; Stein & Ortmann, 1996). For extremely strong brands only, a longer useful life may be applied (Boorberg et al., 1998, pp. 1114–1116). These arguments correspond to the general opinion before the 1996 court ruling (Richter, 1990). Because of the range of opinions, the question of applying amortization remains unclear for both financial and tax accounting purposes.

A brand acquired in an acquisition of a whole enterprise (in a merger or other business combination) and which is not reliably separately identifiable is, as mentioned above, included in goodwill. This goodwill (and therefore the brand, being part of it) can, in Germany, be either amortized over a maximum of 4 years or a longer useful life, or treated directly as an expense. If the company opts to amortize intangible assets over more than 4 years, a useful life of 15 years is usually applied in the financial accounts due to a corresponding fiscal regulation. Goodwill arising from a business combination can additionally be set off against reserves. The considerable number of options in the treatment of

goodwill arising from a business combination shows that in Germany it is significant whether a brand is separated from the goodwill and recognized as an identifiable asset or incorporated in the goodwill. Whereas in the first case it must be amortized over its useful life, in the second it can be amortized over a period of up to 4 years, amortized over the useful life of the goodwill, directly expensed, or set off against reserves. This means it really matters how a brand acquired in a business combination is recorded.

And so a general divergence emerges between the German and French accounting conceptions regarding the amortization of brands, resulting—as already seen—from different perceptions of the function of depreciation. According to HGB, para. 253, al. 2, s. 2 the dominant objective of normal depreciation in Germany is not to take account of a fall in value but to spread the cost over the useful life (Coenberg, 1996, p. 130; Döring, 1995, pp. 926–928; Moxter, 1996, pp. 215–217). The same reasoning is followed by the IASC (1998, para. 46). The purpose of amortization is therefore clearly defined under IAS and German rules, whereas in the French General Accounting Plan amortization “hesitates between the objective of assessing depreciation and that of spreading costs” (Klee, 1992, p. 50).

There are thus important differences between Germany and France with respect to both the concept and the period of brand amortization. Whilst in Germany brands are treated as amortizable assets with relatively short lives, in France brands are nonamortizable intangible fixed assets. IAS 38, with its rebuttable presumption of a useful life no longer than 20 years, lies somewhere in between these positions, albeit closer to the German position (see Table 2).

3.3. Revaluation

For the valuation of intangible assets at the end of the financial year, IAS 38 defines a benchmark treatment and an allowed alternative treatment (para. 63–64). The benchmark treatment is based on the initial measurement minus accumulated amortization and accumulated impairment losses, as explained above. Under the allowed alternative treatment, “an intangible asset should be carried at a revalued amount, being its fair value at the date of the revaluation less any subsequent accumulated amortization and any subsequent accumulated impairment losses. . . . Fair value should be estimated by reference to an active market” (para. 64). However, as IAS 38, para. 67 specifies, “an active market cannot exist for brands,” as is the case for other intangible assets, like newspapers, mastheads, publishing rights etc., because “the transactions are relatively infrequent.” Therefore, the prices for recent transactions do “not provide sufficient evidence of the fair value” of other

Table 2
Amortization of brands

IAS 38	France	Germany
<ul style="list-style-type: none"> • Amortization required over the useful life • 20 years normally the maximum (rebuttable presumption) • Disclosure if the amortization period exceeds 20 years • Impairment test if amortization period > 20 years 	<ul style="list-style-type: none"> No amortization Impairment possible 	<ul style="list-style-type: none"> Amortization required Generally over 3–5 years, limited possibility over 20 years

brands. Due to this lack of a reliable measurement basis, IAS 38 appears not to allow revaluation of brands.

The situation is absolutely clear in Germany and France. There, in accordance with the Fourth European Directive (Article 33, para. 1), the revaluation of intangible assets is generally not allowed. In Germany, due to the strong principle of prudence, revaluation is not allowed for any asset. In France, the general revaluation option is limited (as it is in Article 33 para. 1 of the Fourth Directive) to tangible fixed and financial assets.

In practice, the positions taken by IAS 38 and the French and German laws lead to the same result: revaluation of brands is forbidden.

3.4. Recovery of the carrying amount

Brands may be subject to a write-down because of extraordinary conditions that lead to an unexpected decline in value. Examples of such circumstances are a loss of customer confidence because of an event such as the “Elch-Test” for Daimler-Benz or a loss of image such as “Brent Spar” was for Shell (Meffert & Burmann, 1998, pp. 118–119).

To determine whether or not an intangible asset is impaired, an enterprise applies IAS 36 (“Impairment of Assets”). In addition to the requirement included in this standard, IAS 38 adds that “an enterprise should estimate the recoverable amount of the following intangible assets at least at each financial year end, even if there is no indication that the asset is impaired: (a) an intangible asset that is not yet available for use; and (b) an intangible asset that is amortized over a period exceeding 20 years from the date when the asset is available for use” (para. 99).

This mandatory write-down, in the case of impairment, is a direct consequence of the worldwide-applied principle of “lower of cost or market.” Therefore it is compatible with the French and German rules.

In France, the *Commission des Opérations de Bourse* (COB — French equivalent of the Securities and Exchange Commission) also indicates that management is responsible for determining the objective and verifiable numeric criteria upon which the value of elements of intangible assets may be based year by year (COB, 1991, p. 10; X, 1991).

German rules regarding write-downs differentiate between state-owned corporations and private companies, current and noncurrent assets, and whether the decline in value is expected to last for a longer or shorter period. In the standard case of a state-owned company whose brands are classified as noncurrent assets, the brand must be written down to its fair value if an event has decreased the value of the brand for quite a long time. If there is a recovery of value later, the company must restate the brand at the lower of cost or market (HGB, para. 280).

4. Limitations and directions for future research

The topic of brand valuation has not been developed further here because it represents a separate topic in itself. The reliability and relevance of each of the methods in either Germany

or France or within the context of IASC standards is open to discussion. It would also be interesting to address the following questions:

- How do industry norms for tradable assets (e.g., landing slots, franchise rights) differ in France and Germany?
- What are the limits of market valuation?
- How do companies deal with the following problems encountered in the use of royalty-relief methods: selection and determination of royalty rates, discount rates, protection/renewal and length of brand life, and calculation of discounted value on the basis of a terminal value or to perpetuity?

Harmonization efforts are long-run and evolutionary in nature, with the market ultimately determining which of the existing alternatives will prevail. Harmonization also requires countries to change their domestic practices at some point — at least for multinational reporting. In this context, our conclusions on the difficulty of harmonization may be limited by the fact that any assessment as to whether harmonization initiatives have worked or are working is difficult on a spot basis.

5. Conclusion

The Fourth and Seventh European Directives allow wide latitude for the treatment of brands, in relation to their capitalization, their valuation and amortization, and the treatment of the difference arising on first consolidation. This partly explains the emergence of accounting solutions that may be divergent or even contradictory in different European countries, as in the examples studied, France and Germany. Table 3 presents the major differences between the three sets of rules.

Firstly, it becomes obvious that with regard to self-generated brands German standards have more in common with the IASC opinion than with leading accounting assumptions in France. In consolidated financial statements, as far as brands are concerned, France clearly has no hesitation in breaking away from the focus on the prudence principle and

Table 3
Fundamental differences

	IAS 38	France	Germany
Capitalization of internally generated brands	Impossible	Might be possible	Impossible
Allocation to brands of the difference arising on first consolidation	<i>Reliability</i> Possible in theory, difficult in practice	<i>Relevance</i> Possible and widely practiced	<i>Reliability</i> Possible in theory, difficult in practice
Amortization	<i>Reliability</i> 20 years	<i>Relevance</i> No amortization	<i>Reliability</i> Short amortization
	<i>Reliability/relevance</i>	<i>Relevance</i>	<i>Reliability</i>

moving towards a more economic approach to accounting. Most surprisingly, the IASC stresses the reliability aspect (“separability,” “identifiability,” and “reliable measurement of cost”) over the relevance aspect in connection with brands. Finally, regarding the concept and period of amortization of brands, the IASC’s position is closer to Germany than France.

Brand accounting is the focus point of the conflicting relationship between the major characteristics of accounting data, “relevance” and “reliability.” This research shows that the frequently stated association between the Anglo-American accounting philosophy and “relevance,” and between the Continental-European philosophy and “reliability,” may not apply when it comes to brand accounting (see Table 3). It also questions the research concept of clustering national accounting systems, because France and Germany, two countries often found together in the “Continental-European cluster” (Choi, Frost, & Meek, 1999, p. 37), have adopted very different solutions for brand accounting in relation to each other and to the IASC.

Although we worked on a spot basis (see above), this paper seems to be a good illustration of the difficulty of international accounting harmonization. It could be worthwhile to think about other ways of making accounting comparable in the meantime, in order to avoid fundamental opposition (we find it difficult to imagine French companies starting to amortize brands, even over 20 years), for example by providing additional information in the notes. One idea could be the disclosure of an additional statement of the breakdown, changes, and values for the most important groups of intangible assets in a corporation (Haller, 1998, pp. 583–591). This should show to what extent the corporate value is made up of different sorts of intangibles. Such a statement would have to be accompanied by additional information, e.g., explaining the brand(s) and its (their) valuation. Our reflections demonstrate that brands in particular and intangibles in general are set to remain a major accounting challenge in the future.

Acknowledgments

The authors thank participants of the 1999 “Emerging Issues in International Accounting” Conference (CIERA and Niagara University) and two anonymous reviewers for helpful comments and suggestions. They also thank Ann Gallon for helping to finalize the English-language version of the paper. The present paper was made possible by financial support from the Research Center of the HEC School of Management (Paris) and the European Commission (TSER project “MERITUM” - MEasuRing Intangibles To Understand and improve innovation Management).

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Pergamon

The International Journal of Accounting
36 (2001) 169–193

**The
International
Journal of
Accounting**

International accounting harmonization, banking regulation, and Islamic banks[☆]

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Abstract

Islamic banks perform both commercial and investment banking services but do not establish firewalls to separate these two services legally, financially, and managerially. Unlike conventional commercial banks, Islamic banks are prohibited from charging or paying of interest. Instead, Islamic banks offer profit-sharing investment accounts, such that investors' return depends on the return on the assets financed by the investors' funds. Supervisory authorities in countries in which Islamic banks operate have taken various approaches to regulate Islamic banking. Such variations appear to have resulted in Islamic banks adopting different accounting treatments for investment accounts, although most of the countries in which Islamic banks operate either look directly to international accounting standards as their national standards or develop national standards based primarily on international accounting standards. This rendered the financial statements of Islamic banks noncomparable. It also implies that the calls for worldwide adherence to international accounting standards to achieve harmonization in financial reporting, regardless of cultural differences that affect the way in which business transactions are carried out (in substance as well as in form), should not go unchallenged. The paper also casts light on the need to implement the accounting standards promulgated by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), because these standards specifically cater for the unique characteristics of the contracts that govern the operations of Islamic banks. © 2001 University of Illinois. All rights reserved.

Keywords: International accounting standards; Islamic banks; Harmonization; Banking regulation; Investment banking; Commercial banking

[☆] The views expressed in this paper are those of the author and do not necessarily represent those of the named institution or of any other organizations.

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1. Introduction

Over the last 15 years there has been increasing interest in enhancing the harmonization of accounting and financial reporting by banks. For example, as part of its harmonization program, the European Union issued in 1986 the Council Directive which contains regulations on the layout of bank balance sheets and profit and loss accounts.¹ The International Accounting Standards Committee (IASC) also issued International Accounting Standard (IAS) No. 30: *Disclosures in the Financial Statements of Banks and Similar Financial Institutions* (1990) and IAS No. 32: *Financial Instruments: Disclosure and Presentation* (1995). And more recently, the Basle Committee (1998a, 1998b) and the United Nations (1996b) issued studies that attempt to enhance transparency and comparability in banks.

It is argued that the need for international accounting harmonization should be met by an international accounting organization (Carsberg, 1998). Transnational institutions (e.g., World Bank, United Nations, European Union, Organization of Economic Cooperation and Development, and the Basle Committee) support the IASC as the only plausible world harmonizer of accounting (Nobes, 1996). Furthermore, the IASC is working with the International Organization of Securities Commissions (IOSCO) to bring about the possibility that companies with stock market listings in many countries can satisfy all the regulatory requirements with one set of accounting standards, IASC standards. The IASC is also working with the Basle Committee on an exposure draft that deals with accounting for financial assets and financial liabilities. This covers, among other things, important matters relating to banks, e.g., how to deal with impaired loans, how to report borrowings, and how to account for the effect of transactions undertaken to hedge risks.

The recent global economic crisis also seems to have renewed support to the need for a *lingua franca* of financial reporting, thereby giving further endorsement to the work of the IASC as a vehicle for achieving international harmonization of financial reporting. For example, it is reported that the Group of Seven leading industrial nations (G7) “will expect nations to work towards a common accounting practice, which is obviously likely to work towards companies adopting a common accounting standards.”² Furthermore, the World Bank and the International Monetary Fund (IMF) could probably put more pressure on regulators by tying their loans to use of IASs. It is also reported that the World Bank and IMF agreed with the Big Five accounting firms that IASs and International Standards on Auditing “are the standards that should be used by financial institutions in those countries to accomplish the World Bank and IMF objectives of fostering economic stability.”³ The World Bank would also like to see the Big Five accounting firms stop putting their names to accounts drawn up under local standards that do not meet international reporting standards.⁴

¹ For more details see Arthur Andersen & Co. (1987).

² Accounting and Business (1998, p. 2).

³ IFAC Quarterly (1998, p. 7).

⁴ Accountancy International (1998, p. 6).

These efforts tend to fall in line with the IASC's aim in the longer term to develop "a single set of high-quality accounting standards for all listed and other economically significant business enterprises around the world" (IASC, 1998b).⁵

International accounting harmonization may be defined^{6,7} as "the process of bringing international accounting standards into some sort of agreement so that the financial statements from different countries are prepared according to a common set of principles of measurement and disclosure" (Haskins, Ferris, & Selling, 1996, p. 29).

It is also argued that harmonization "(often equated with the adoption of IAS) ... implies that accounting is a transaction-specific activity and, therefore, the relationships among transactions, events, and systems are universal in their application without regard to geographic, temporal, or systematic differences" (Larson & Kenny, 1996, p. 5–6).

Hence, according to some (e.g., Briston & Wallace, 1990; Wyatt, 1991), harmonization implies that accounting standards can be the same worldwide. This view is supported by international standard-setters who argue that "I have never been convinced that cultural or economic differences from country to country justify different accounting for similar business activities in large organizations. Reasonable people, accepting the desirability of harmonization, should be able to agree eventually on common solutions" (Carsberg, 1995, p. 4).

Wyatt (1992, p. 40) also claims that "the accounting issues in the international arena are not fundamentally different from those in national arenas."

However, the above view of harmonization is challenged on the grounds that "the movement towards international harmonization, whose principles should eventually lead to a certain uniformity in accounting standards, comes into conflict with a number of objectives of financial statements and, more fundamentally, with *the economic, social and cultural contexts of different accounting systems*, and even with some manifestations of national sovereignty" (Hoarau, 1995, p. 220).

Such a concern is shared by others who are of the opinion that "financial reporting and its regulation may have multiple purposes reflecting each country's social, cultural and political environment. . . Thus the original idea of harmonization as moving towards uniformity in accounting standards across countries may not be achieved as long as social, cultural and political differences exist across countries" (Hussein, 1996, p. 95).

⁵ The US Financial Accounting Standards Board (FASB) shares the IASC aim that "ideally, the ultimate outcome would be the worldwide use of a single set of high-quality accounting standards for both domestic and cross-boarder financial reporting," but differs with IASC in that "FASB might reorganize itself to become an international standard setter or that an alternative international structure and process could be established that meets the FASB's fundamental objectives" (FASB, 1998, pp. 6, 7–8).

⁶ See also Nobes and Parker (1995), Tay and Parker (1990), and van der Tas (1988, 1992).

⁷ The literature (e.g., Most, 1994, p. 4) distinguishes between *uniformity* (the elimination of alternatives in accounting for economic transactions, other events, and circumstances), *standardization* (the reduction of alternatives while retaining a high degree of flexibility of accounting response), and *harmonization* (the reconciliation of different accounting and financial reporting systems by fitting them into common broad classifications, so that form becomes more standard while content retains significant differences).

Hamid, Graig, and Clark (1993, p. 146) lend support to the cultural influence on the international harmonization of accounting. They argue that “religion in general and Islam in particular have the potential to extend [sic] a profound cultural influence in the quest for the international harmonization of accounting.”

This point is developed further later in the paper.

The accounting firms have also voiced their concern on the issue of harmonization. It is claimed that “the harmonization of international accounting standards...is a worthy objective, but a choice has to be made between the advantages of harmonized standards and its disadvantages. Users should be particularly wary of cases where the same terminology in different countries actually represents very different characteristics” (Price Waterhouse, 1990, p. 15).

Goeltz (1991, pp. 85, 86) goes further and argues that “full harmonization of international accounting standards is probably neither practical nor truly valuable... A well developed global capital market exists already. It has evolved without uniform accounting standards.”

In addition to the above, a study by the United Nations (1996a) outlines differences in national accounting practices and the related obstacles to harmonization. The study suggests that some differences are caused by unique historical events, some by forces external to a country and some by different purposes for financial reporting. The latter is described as the most fundamental of the causes of differences (see also Nobes, 1996).

Islamic banks are ethically funded organizations that are established in various parts of the world, particularly in the Middle East. It is generally believed that Islamic banking started to take off in the aftermath of the boom in the oil prices in 1973–1974 (Moore, 1997; Wilson, 1997). So far, in Iran, Sudan and, to some extent, Pakistan the whole banking system has been transformed to comply with Islamic *Shari'a*.⁸ The growth of this industry has been remarkable. It is reported that in 1996 the total assets of the 166 Islamic financial institutions reached US\$137 billion.⁹

Islam does not recognize the separation between spiritual and temporal affairs, and considers commerce as a matter of morality and is subject to the precepts of the *Shari'a*.¹⁰ Hence, Islamic banks, like other Islamic business organizations, are established with the mandate to carry out their transactions in strict compliance with Islamic *Shari'a* rules and principles. The business of Islamic banks, therefore, is driven by *Shari'a* approved contracts.

⁸ *Shari'a* is the sacred law of Islam. It is derived from the *Qur'an* (The Muslim Holy book), the *Sunna* (the sayings and deeds of Prophet Mohammed), *Ijma* (consensus), *Qiyas* (reasoning by analogy), and *Maslaha* (consideration of the public good or common need).

⁹ The International Association of Islamic Banks (1996).

¹⁰ The blending of religion and business has also been recently appreciated in other firms. For example, reflecting on the USA business environment Zelizer (1998, p. 8A) reports that “in the 21st century more religious leaders will be found in the corporation than in the conventional church” and that “the gap between religion and the corporate world is narrowing.”

Such an approach to business has implications for the validity of applying the concept of ‘economic substance over legal form’ in accounting for the economic transactions undertaken by Islamic banks. According to Gambling and Karim (1991, p. 103) “the conceptual framework of accounting currently applied in the West finds its justification in a dichotomy between business morality and private morality. As such, it cannot be (unquestioningly) implemented in other societies which have revealed doctrines and morals that govern all social, economic and political aspects of life.” Indeed, Western accounting rules are presented as technical, not ethical rules (Karim, 1996a). Hence, in the context of Islamic banks, if accounting information is to give a faithful representation of the economic transactions or events that it purports to represent, it is necessary that they are accounted for and presented in accordance with the substance as well as form of *Shari’a* contracts that govern these transactions or events. For example, *murabaha* is not an ‘in-substance’ purchase finance by a loan, and *ijarah muntahia bittamleek* is not an ‘in-substance’ capital lease.¹¹

In 1990, the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), a private standard setting body, was established by Islamic banks and other interested parties to prepare and promulgate accounting, (and recently) auditing and governance standards based on the *Shari’a* precepts for Islamic financial institutions. Karim (1990) claims that Islamic banks have taken the initiative to self-regulate their financial reporting for fear that the regulatory bodies in the countries in which they operate may otherwise intervene and mandate the accounting policies of Islamic banks.

AAOIFI’s pronouncements are intended to serve Islamic banks in the various countries in which they operate. However, like the IASC, AAOIFI has no power to enforce its standards. Karim (1990) suggests that since Islamic banks mainly operate in government-driven economies, AAOIFI might find that the only way to implement its promulgated standards fully was by depending on the cooperation of the national banking regulators.

This paper examines the impact of the religion of Islam on the international efforts to harmonize accounting and financial reporting. Whilst earlier efforts (e.g., Hamid et al., 1993) endeavored from a conceptual perspective to argue for the influence of the religion of Islam on international harmonization of accounting, their work did not relate to IASs nor to the accounting practices of Islamic banks.

The paper argues that the structure and processes of Islamic banks do not readily fit in with those of conventional universal banking, which combines both commercial and investment businesses. This seems to have resulted in supervisory bodies adopting different approaches to regulate Islamic banking. Such variations in the regulation of Islamic banking appear in turn to have resulted in Islamic banks adopting different accounting treatments for the same transaction, although most of the countries in which these banks operate either look directly to IASs as their national standards or develop national standards based

¹¹ *Murabaha* and *ijarah muntahia bittamleek* are defined later in the paper.

primarily on IASs.¹² This rendered the financial statements of Islamic banks noncomparable, thereby departing from the concept of comparability which is considered in the IASC (1989) *Framework for the Preparation and Presentation of Financial Statements* as one of the four principal qualitative characteristics that make the information provided in the financial statements useful for users. This implies that the calls for worldwide adherence to IASs to achieve harmonization in financial reporting regardless of cultural differences should not go unchallenged. Rather, Islamic banks should be asked to implement AAOIFI's standards, as is currently the case in some countries. This would render the financial statements of these banks comparable because AAOIFI's standards are specifically developed to cater for the unique characteristics of the *Shari'a* contracts that govern the Islamic banks' financial instruments.

The remainder of this paper is organized as follows:

- A brief account of commercial and investment banking.
- An overview of the characteristics of Islamic banks and discusses investment accounts, which represent one of the unique financial instruments that are used by Islamic banks in their mobilization of funds.
- An examination of the approaches pursued by supervisory authorities to regulate Islamic banking.
- A discussion of the different accounting treatments of investment accounts adopted by Islamic banks prior to compliance with the pronouncements of AAOIFI.
- Concluding remarks.

2. Commercial and investment banking¹³

In the USA, UK, and Japan, commercial banking (broadly comprising receiving deposits, effecting customers' payment instructions, and providing finance in a variety of ways) is separated from investment banking (including capital market activities on behalf of the bank, investment management, and corporate financing and advice), although with varying degrees and forms. However, recent market pressures, among other things, in these countries have gradually led to the breaking down of this separation between the two types of banking, thereby moving towards the German model of universal banking — banks being able to engage in securities and other activities, including holding equity stakes in nonfinancial corporations.¹⁴

¹² The problem is that the Islamic transactions do not correspond to the transactions for which the IASs were intended, and may therefore be applied to them in different ways, none of which is satisfactory, e.g., the application of IAS 31: *Financial Reporting of Interests in Joint Ventures* (1993) to *mudaraba* or *musharaka* (these financial instruments are defined later in the paper).

¹³ The information on commercial and investment banking draws from Cranston (1997) and Dale (1996).

¹⁴ In practice not only does universal banking permit the combination of commercial and investment banks, but in many places it also enables banks to provide a number of other services such as insurance, real-estate brokerage, and travel agency (Cranston, 1997, p. 34).

In the USA, the banking and securities business regulation takes legal form in the famous 1933 Glass–Steagall Act, which imposes strict separation between commercial and investment banking. According to this legislation banks are not permitted to undertake securities business or to own securities firms. This is meant to ensure that the risks incurred by commercial and investment banks are kept separate. In recent years the Glass–Steagall Act has been under enormous pressure. Substantial effort has been put into exposing the historical false underpinning of this Act and to demonstrating that the risks and abuses were not as great as its proponents claimed.¹⁵ In addition, the USA regulatory authorities have recently started to adopt a more liberal interpretation of this statute, thereby permitting commercial banks to develop significant securities operations through special-purpose affiliates.¹⁶

As in the USA, the separation between commercial and investment banking was also enforced by law in Japan after World War II. However, in line with the general liberalization of financial markets, the 1992 Financial System Reform Act allowed commercial banks and securities firms to expand into each other's business territory by establishing separate subsidiaries.

In the UK, separation between commercial banking and investment banking (also known in the UK as merchant banks or acceptance houses) was based on tradition:

The institutional history, rather than any policy decision that it was risky to associate core [commercial] banking with securities activities, seems to explain the distinctive spheres of activities. The separateness of functions was reinforced by conservatism and cartelization: there was no desire on the part of insiders to change matters, and outsiders could not break the mould. Certainly there was no major legal impediment to multifunctional banking, in which commercial and investment banking are combined (Cranston, 1997, pp. 21–22).

The amendment of the rules of the London Stock Exchange in 1986 to allow acquisition of member firms by outsiders, including commercial banks, has eroded the traditional distinction between commercial and investment banking.¹⁷ Firewalls (to divide the different firms in the conglomerate legally, financially, and managerially) are often erected to prevent a securities subsidiary of a commercial bank exposing the bank to securities market risk as a result of problems with the subsidiary.

In contrast to the USA, Japan, and the UK, the law and custom, in Germany have long sanctioned universal banking:

Private bankers engaged in deposit taking, lending, and securities underwriting from the eighteenth century, and the joint-stock banks of the nineteenth century operated as universal banks from the outset (Cranston, 1997, p. 22).

¹⁵ See, for example, Benston (1990).

¹⁶ At the time of writing this paper, it was reported that the US Administration and Congress have reached an agreement to roll back the restrictions of the Glass–Steagall and Bank Holding Company Act, thereby eliminating barriers between banks, securities firms, and insurance companies (Labaton, 1999).

¹⁷ For more details on the integration of banking and securities business, see Dale (1992).

In this structure the risks involved in commercial and investment banking are pooled.

In the European Community universal banking is also legally sanctioned. This is contained in the Second Banking Directive and the Investment Services Directive. These laws were drawn up on the assumption that universal banking would be the relevant model. A recent study endorses this view: “Clearly, the future of banking systems will be the universal banking model prevailing in Europe rather than the highly segmented American and Japanese models” (United Nations, 1996b, p. 23).

Risk and conflict of interest are two of the main issues that lie behind the justification of rules to separate commercial banking from investment banking. The main business risk which commercial banks face is credit risk, whereas for investment banks it is security market risk. Commercial banking involves nonmarketable assets, which are typically held on the balance sheet until maturity, whereas investment banking involves marketable securities that are of a rapid turnover nature. Given the different nature of the assets of both types of banking, the issue is whether commercial banking should be allowed to combine with the riskier business of investment banking and to be involved in the underwriting activity which might lead to bank failures. A case in point is the mixed banking-securities business of Barings Bank in the UK and the way in which its banking arm was able to fund its risky securities operations in Singapore.¹⁸ Cranston (1997, p. 101) notes that “whereas the independent securities firm which collapses can probably be wound up in an orderly fashion by selling off its marketable assets [with little difference between the value of these assets on a going concern basis and in liquidation because they are determined on a mark to market basis], if the securities side of a bank collapses this may mortally wound the banking side [thereby exposing depositors to heavy losses because banks’ assets are generally worth significantly less in liquidation than on a going concern basis]. The funding base (deposits) of core banking is inherently volatile and may evaporate on the slightest hint of trouble in a banking group as a whole.”

Firewalls are meant to be one of the means to address the risk of this contagion problem. Firewalls should also enable the commercial banking side to resist calls for financial support when the investment business of the bank is exposed to serious problems. However, it is argued that not much seems to have been done as to how the potential contagion of risk can be managed.¹⁹

Conflict of interest takes place, for example, if a commercial bank is allowed to underwrite securities, as it may underwrite poor securities for a borrower to pay the bank’s poor loans with this borrower. While a bank concerned with its reputation will refrain from such behavior, less trustworthy banks may attempt to fool naïve investors. The 1986 Financial Services Act in the UK called for the erection of Chinese walls to restrict the flow of information between related firms in a conglomerate, thereby preventing such conflicts of interests from arising.

¹⁸ See Dale (1996) for more details on the case of Barings plc.

¹⁹ Cranston (1997, p. 104).

Of particular relevance to this paper is the fiduciary service of investment management that is provided by investment banks. According to Hitchins, Hogg, and Mallett (1996, p. 492) investment management is “a business in which institutions manage financial assets for their own account or on behalf of clients. This may involve individual management of a customer’s portfolio or may be performed through an investment vehicle which pools investors’ funds to provide the investors with professional investment management. In the former case, funds may be managed on an advisory basis where the fund manager will act in accordance with specific instructions from their client or on a discretionary basis whereby the fund manager takes responsibility for making investment decisions on behalf of their clients. In pooled funds, units or shares in the fund are sold to the investors and the proceeds are predominantly invested in securities to achieve stated investment objectives.”

Hitchins et al. (1996, p. 491) further state that “fiduciary services provide a bank with a source of fee and commission income without . . . [exposing] a bank to market or credit risk except to a very limited extent; however, they do create fiduciary risk, or the risk that the bank will fail to carry out the customer’s instructions or will do so in a way that can be shown to be negligent or unprofessional, with the result that the bank may be open to a claim for damages and suffer a loss of reputation.”

Income generated from managing these funds is recognized in the bank’s income statement, although the funds themselves are treated off-balance sheet. Heffernan (1996) argues that banks enter the off-balance sheet business because they believe it will enhance their profitability, for different reasons. For example, off-balance sheet instruments may improve a bank’s risk management techniques, thereby enhancing profitability and shareholder value added. In addition, to the extent that regulators focus on bank balance sheets, off-balance sheet business, as in the case of investment management, may make it easier for a bank to meet capital and liquidity requirements.

Treating funds received on fiduciary basis as an off-balance sheet item is in line with IASs. IAS 30 *Disclosures in the Financial Statements of Banks and Similar Financial Institutions*, which is the only standard issued by the IASC specifically for banks, states that “banks commonly act as trustees and in other fiduciary capacities that result in the holding or placing of assets on behalf of individuals, trusts, retirement benefit plans, and other institutions. Provided the trustee or similar relationship is legally supported, these assets are not the assets of the bank and, therefore, are not included in its balance sheet” (IASC 1990, paragraph 55).

The next section provides an overview of the characteristics of Islamic banks and examines the extent to which these characteristics fit in with those of commercial and investment banking. The section also discusses investment accounts in detail. These accounts represent one of the unique financial instruments that are used by Islamic banks in their mobilization of funds. In the majority of Islamic banks, these accounts represent a high percentage of the total balance sheet funding.²⁰

²⁰ See Karim (1996b) and Karim and Ali (1989).

3. An overview of the characteristics of Islamic banks

Islamic banking is a type of universal banking. However, Islamic banks have their own special characteristics. The majority of Islamic banks perform two basic functions, namely investment management and commercial banking. Unlike conventional commercial banks, Islamic banks do not pay or charge interest on lending or borrowing of money. This is because the *Shari'a* strictly prohibits, among other things, the receipt and payment of *riba* (interest).²¹ Hence, Islamic banks cannot hold or issue interest-bearing securities such as treasury bills or bonds. The banking services provided by Islamic banks to business customers are mainly confined to letters of guarantee, letters of credit, and current/demand accounts. They also provide other trade finance services via various types of contract which are mentioned below.

Investment management is the main service provided by almost all Islamic banks. As an alternative to borrowing funds and paying interest on them, Islamic banks use a version of the profit sharing *mudaraba* contract²² (explained in detail later) to mobilize funds in investment accounts in order to invest them on behalf of holders of these accounts. This service is performed also, but to a lesser extent, on the basis of the agency contract. As an alternative to lending funds and charging interest on them, Islamic banks use various contracts (e.g., *murabaha*, *musharaka*, *ijarah*, *salam*, etc.)²³ including the *mudaraba* contract to invest funds under management as well as their shareholders' funds.

Although Islamic banks tend to perform a hybrid of services of both commercial and investment banking, the structure and processes of Islamic banks do not readily fit in with those of conventional universal banking, which combines banking and investment businesses. For example, unlike universal banks, Islamic banks do not erect firewalls to separate, legally, financially, and managerially their investment and commercial banking services. Rather, the majority of Islamic banks commingle investment accounts' funds with their shareholders' funds, invest both funds under the bank's management in the same investment portfolio, and report these investments and their results in the bank's balance sheet and income statement. Hence, investment accounts' funds are not 'ring fenced' from the bank's funds.

Furthermore, investment companies²⁴ (e.g., mutual funds) "sell their capital to the public, while Islamic banks accept deposits from the public. This implies that shareholders of an investment company own a proportionate part of the company's equity capital and are entitled

²¹ *Riba* is translated strictly as usury, but interpreted by modern Islamic scholars as being equivalent to interest (see Mallat, 1988; Saleh, 1992; Taylor & Evans, 1987).

²² The original form of the *mudaraba* contract is very similar to that of the *commenda* contract in general use by Italian and other merchants in the late middle ages and early modern period; see Bryer, 1993; Çizakça, 1996.

²³ *Murabaha* is sale at cost plus an agreed upon margin of profit; *musharaka* is a form of partnership; *ijarah* is leasing; and *salam* is a purchase of a commodity for deferred delivery in exchange for immediate payment. For more details on these and other contracts see AAOIFI (1998).

²⁴ It is worth noting that there are Islamic investment companies (e.g., Al-Tawfeek Investment-Bahrain, International Investor-Kuwait) and Islamic Investment Banks (e.g., First Islamic Investment Bank-Bahrain, Al-Tawfeek Investment Bank-Pakistan), which do not perform any commercial banking operations. Whilst central banks supervise Islamic investment banks, in some countries Islamic investment companies are regulated by a different body.

to a number of rights, including receiving a regular flow of information on developments of the company's business and exerting voting rights corresponding to their shares on important matters, such as changes in investment policy. Hence, they are [in principle] in a position to influence strategic decisions. By contrast, depositors in an Islamic bank are entitled to share the bank's net profit (or loss). . . Moreover, depositors have no voting rights because they do not own any portion of the bank's equity capital. Hence, they cannot influence the bank's investment policy" (Errico & Farahbaksh, 1998, p. 11).²⁵

And unlike those of investment companies, Islamic banks' financed assets are neither marketable securities nor are they measured on the basis of "mark to market" or fair value.^{26,27} Rather, as mentioned above, the assets of Islamic banks are governed by various forms and are stated at cost and/or the lower of cost and market. However, given that Islamic banks cannot hold treasury bills or bonds or other interest yielding securities, it is claimed that bank supervisors would have difficulty in putting a value on the assets of these banks. Steele (1984) argues that this is because "the traditional banking system has much of its assets in fixed interest instruments and it is comparatively easy to value that. . . But it is very difficult indeed to value an Islamic asset such as a share in a joint venture; . . .and the. . . [bank supervisors] would have to send a team of experienced accountants into every Islamic bank. . ., to try to put a proper and cautious value on its assets."

Furthermore, the characteristics of Islamic banks tend to raise a set of issues concerning corporate governance and agency problems (Archer & Karim, 1997; Archer, Karim, & Al-Deehani, 1998) that have no parallels in either commercial banks or investment banks.

The *mudaraba* contract has detailed juristic rules that are derived from the *Shari'a*²⁸ and which regulate the relationship between investment account holders (IAH) as providers of funds and the bank in its capacity as *mudarib* (entrepreneur). The *mudaraba* contract is a profit sharing financial instrument²⁹ that is neither a financial liability nor an equity instrument in the normal sense. Unlike equity instruments, investment accounts are

²⁵ As mentioned later, the *mudaraba* contract does not allow investment account holders to interfere in the management of the bank.

²⁶ For more details see Karim (1995a).

²⁷ In the terms of IAS 39 *Financial Instruments: Recognition and Measurement*, Islamic banks' assets are neither (a) held for trading nor (b) available for sale. Note that the IAS 39 measurement basis for such category of assets is cost or amortized cost subject to review for impairment (and not fair value). In general, AAOIFI standards do not differ from IASs when the substance of the transaction is the same.

²⁸ For a comprehensive coverage of these details see Udovitch (1970) and Vogel and Hayes (1998).

²⁹ The *mudaraba* contract is not similar to a joint venture, which is the subject matter of IAS 31: *Financial Reporting of Interests in Joint Venture*. A joint venture is defined as "a contractual arrangement whereby two or more parties undertake an economic activity which is subject to joint control" (IAS 31, paragraph 2). However, in a joint venture, as envisioned in IAS 31, the power to govern the financial and operating policies of an economic activity is shared by two or more parties, whereas in the *mudaraba* contract the power to govern the financial and operating policies of the activity is the sole prerogative of the *mudarib* (i.e., the bank). IAH have no right to intervene in these policies.

redeemable at maturity or at the initiative of their holders,³⁰ but (usually) not without the prior consent of the bank. Islamic banks can refuse to pay IAH until the results of the investments financed by IAHs' funds are determined. In addition, IAHs do not have the benefit of a board of directors to monitor management on their behalf.³¹ On the other hand, unlike debt instruments, investment accounts are not a liability of the bank because they earn their returns by sharing in the profits generated from their funds, and also bear their share in any losses incurred. Furthermore, Islamic banks do not guarantee the value of these investment accounts. Thus, holders of these accounts have a claim on the bank's earnings or assets, which ranks *pari passu* with that of the shareholders.³² The fact that the *mudaraba* contract is neither a debt nor an equity instrument means that it is not a hybrid instrument comprising debt and equity (for example, it is *not* debt with an embedded equity derivative).

In the unrestricted type of *mudaraba*, IAHs authorize the bank to invest their funds at its discretion including commingling the IAHs' funds with those of shareholders. In the restricted *mudaraba*, IAH specify to the bank, among other conditions,³³ the type of investment in which their funds should be invested, e.g., real estate, currencies, leasing, etc. However, in both types of *mudaraba* IAH do not have the right to interfere in the management of the fund, and violation of this condition can nullify the contract. Hence, although holders of both types of investment accounts are exposed to different degrees of risk, their relationship with the management of the bank is subject to the same monitoring arrangements.

The aggregate investment portfolio of an Islamic bank is usually financed by IAHs' funds, plus some of shareholders' equity and other sources of funds (e.g., current accounts), the latter being mobilized on bases other than the *mudaraba* contract. If the aggregate investment portfolio yields a positive return, then the shares of profit are allocated between the parties to the contract, IAH and the bank, according to their proportionate shares of their respective investments in the portfolio. The bank's share of profit relates to both its shareholders' funds and to other funds invested in the investment portfolio that do not participate in profit-sharing (e.g., current accounts which are capital-protected but nonparticipating).³⁴ It is to be noted that shareholders' funds invested in the investment portfolio (and elsewhere) and the other nonparticipating funds are not covered by the *mudaraba* contract, and are not governed by its rules. Hence, the bank's shareholders receive the entire profit from these sources, and IAH cannot claim any profit share from them. The bank also receives what is called the *mudarib* share of profit, based in principle on a predetermined percentage of the profit attributable to the IAH, which is

³⁰ In this respect (but not in others) they resemble "puttable stock"; however, the put option is usually not absolute, but subject to the bank's agreement to its exercise.

³¹ For more details see Archer et al. (1998).

³² For more details see Al-Deehani, Karim, and Murinde (1999).

³³ For other types of restrictions see AAOIFI (1993, paragraphs 12, 13).

³⁴ Shareholders receive profit generated from investing the other sources of funds because in case of loss providers of these funds are compensated from shareholders' equity.

specified in the contract. This is a reward for the managerial effort of the bank in managing the funds of IAH. The *mudarib* share of profit allocated to the bank constitutes a return to the bank's shareholders.

If the bank's aggregate investment portfolio yields a negative return, then, according to the *mudaraba* contract, this loss should be borne by the IAH and shareholders pro rata to their respective investments in this portfolio, bearing in mind what was said in the previous paragraph. Like that of shareholders, the liability of IAH is limited to the amount of their investment and no more. In the case of a negative return, in addition to the shareholders' proportion of the loss which is determined pro-rata as indicated above, the bank in its capacity as *mudarib* receives no profit on behalf of its shareholders (the *mudarib* share having a lower bound of zero). However, according to the *mudaraba* contract, if the loss is due to misconduct or negligence of the *mudarib*, then the Islamic bank has to make good the loss.³⁵

The above analysis indicates that the structure and processes of Islamic banks do not readily fit in with those of universal banking, which combines both banking and investment activities. The next section examines the approaches adopted by the supervisory authorities to regulate Islamic banks.

4. Banking regulation of Islamic banks

It seems that so far the supervisory authorities in the countries in which Islamic banks operate have not appreciated the implications of the unique characteristics of Islamic banks.³⁶ Errico and Farahbaksh (1998, p. 5) note that "until now the issue of what standards used for conventional banks should apply to Islamic banks has received little attention, even in countries where all banks follow Islamic principles."

For example, a central banker claims that "in a dual banking system, the supervision of banks basically applies to both Islamic and conventional banks. So far there are no particular banking regulations that apply specifically to Islamic Banks. *With some degree of changes in terminology, the prudential regulations for conventional banks have been adopted to Islamic banks. All provisions for conventional banks...are also applied to Sharia Banks.* The implementation of banking supervision for profit sharing banks, however, differs slightly from those of a conventional bank" (Joyosumarto 1995, p. 12).

The above view is not widely shared. For example, there has been concern about the implication of applying the Basle capital adequacy ratio to Islamic banks (Dale, 1997; Karim, 1996b). At issue is whether investment accounts "be defined as a bank deposit...[or] as investments in a collective investment scheme" (Ainley, 1997, p. 73). Karim (1996b) proposes four possible scenarios for the treatment of investment accounts in the calculation

³⁵ For more details see AAOIFI (1996, 1997).

³⁶ For more details on issues relating to the supervision of Islamic banks, see Wilson (1997).

of the capital adequacy ratio for Islamic banks. Each scenario, it is argued, tends to have implications for the financial and marketing strategies of Islamic banks.

Furthermore, Errico and Farahbaksh (1998, p. 3) argue that “a number of standards and best practices established by the Basle Committee on Banking Supervision...are not always applicable [as they stand] to Islamic banking. An appropriate regulatory framework governing Islamic banks needs to place greater emphasis on the management of operational risks and information disclosure issues than is normally the case in conventional banking.”

So far, there are no generally accepted guidelines on which central banks, in the countries in which Islamic banks operate, would base the treatment of profit sharing investment accounts for the purpose of calculating the capital adequacy ratio for these banks.³⁷

There is also lack of agreed upon guidelines on the liquidity requirements of Islamic banks (Karim, 1995b; Khalid, 1995). Khalid (1995, p. 125) argues that “the conceptual difference which gives rise to different liquidity ratios between an Islamic bank and a conventional bank is that for a conventional bank, all its deposits represent its direct liability to the depositors. The same is true for Islamic bank, but only in the case of deposits in the current and savings accounts. In the case of general investment accounts and special investment accounts, the Islamic bank does not borrow or guarantee the fund.”

The lack of common understanding of the unique characteristics of Islamic banking seems to have been reflected, among other things, in the various approaches taken by supervisory authorities to regulate Islamic banking. These approaches can be categorized into three groups.

The first group of countries (e.g., UAE, Iran, Sudan, Turkey, Yemen, and Malaysia) have enacted Islamic banking in their laws. However, the laws of Islamic banking in some countries in this group (e.g., Malaysia, Iran, Sudan, and Turkey) suggest that they are framed mainly from a commercial banking perspective. For example, in Iran (where the whole banking system has been transformed to comply with Islamic *Shari'a*) “The Law for Usury-free Banking” specifies the aims of the banking system to include, among other things: “Creation of a monetary and credit system. . .” The Law also provides brief details on the mobilization of funds in current accounts, savings accounts, and “long-term investment deposits,” and on the providing of finance to various industries using Islamic financial instruments.³⁸ In Turkey, the “Decree on the Establishment of Special Finance Houses” also provides details on mobilization of funds in current accounts and participation accounts, and the utilization of these funds. In Malaysia, the “Islamic Banking Act 1983” defines “investment account liabilities” to mean “the deposit liabilities at that [Islamic] bank in respect of funds placed by a depositor with that bank. . .under an agreement to share the profits and losses of that bank on the investment of such funds.” The Act consistently refers

³⁷ Due to the absence of such guidelines, AAOIFI has issued a *Statement on the Purpose and Calculation of the Capital Adequacy Ratio for Islamic Banks* (AAOIFI, 1999a).

³⁸ These instruments are mentioned earlier in the section that provides an overview of the characteristics of Islamic banks.

to the Islamic bank lending or advancing of money.³⁹ In Sudan (where the whole banking system also has been transformed to comply with Islamic *Shari'a*), the “Banking Regulation Law 1991” attempts to differentiate between a bank and a financial institution as follows. The former performs all commercial banking activities in addition to accepting investment accounts. A financial institution is defined as an investment company established for the purpose of investments and performs banking activities. However, this differentiation does not seem clear as both types of institutions perform both types of functions. The laws of the other countries in the same group (e.g., UAE and Yemen) explicitly mention that Islamic banks may perform both banking and investment business, but make a brief reference to investment banking.

However, none of the laws in the countries that have promulgated an Islamic banking act provides guidance on issues that are pertinent to investment business. As examples, one may cite the disclosure of specified information to investors to assess the risk of their investments, the fiduciary responsibility of the bank, insider dealing, and guidance on the conflict of interest that may arise from investing both separately and jointly shareholders' funds and IAHs' funds.

The second group of countries (e.g., Bahrain, Qatar, Saudi Arabia, Egypt, and Jordan)⁴⁰ has not so far enacted laws to regulate Islamic banks. Rather, Islamic banks operate within the laws that govern all the banks in these countries. These laws mainly focus on commercial banking. The third group of countries (e.g., Lebanon) also has not enacted Islamic banking law, but subjected Islamic banks to their fiduciary law. Whilst in all three groups Islamic banks are supervised by the central bank, in some countries (e.g., Kuwait) Islamic banks are supervised by the Ministry of Commerce.

The next section discusses the relationship between the approaches adopted by various countries to regulate Islamic banking and the accounting treatments of investment accounts by Islamic banks. These discussions will be used to illustrate how difficult it would be to compare the financial statements of Islamic banks if they continued adhering or were asked to adhere to IASs, supposedly in the interests of achieving international harmonization of financial reporting.

5. Accounting treatments of investment accounts prior to self-regulation

Prior to the promulgation of AAOIFI's *Financial Accounting Statement No. 2: Concepts of Financial Accounting for Islamic Banks and Financial Institutions* (FAS 2), Islamic banks did not differentiate between restricted and unrestricted *mudaraba* in their accounting treatment of investment accounts.⁴¹ In addition, Islamic banks were divided on the accounting

³⁹ See, for example, Articles 16(4); 19(1)(b); 24(1)(b).

⁴⁰ A special law was enacted for the first Islamic bank established in Egypt and Jordan. The other Islamic banks in these two countries that were established later are regulated by the general banking law.

⁴¹ According to AAOIFI (1993), unrestricted investment accounts should be treated on balance sheet, while restricted investment accounts should be treated off balance sheet.

treatment of investment accounts. It is worth noting that most of the countries in which Islamic banks operate either look directly to IASs as their national standards or develop national standards based primarily on IASs.⁴²

As outlined in the section that deals with banking regulation of Islamic banks, there seem to be three approaches adopted by supervisory authorities to regulate Islamic banking. These are depicted in Fig. 1. The first approach is characterization of a group of countries that sought specifically to cover Islamic banking in their national legislation. The financial statements prepared by the Islamic banks (e.g., Kuwait Turkish Evkaf Finance House-Turkey, Bank Islam Berhad Malaysia, Faisal Islamic Bank-Sudan, Dubai Islamic Bank, Tadamon Islamic Bank-Yemen) that operate in these countries show that these banks have treated investment accounts as an on-balance sheet item and classified these accounts as a liability. This treatment, which is similar to that of deposits in commercial banks, is not unexpected since the laws that govern these banks were either framed mainly from a commercial banking perspective or made only brief reference in their laws to investment banking.

The second approach is represented by a group of countries (e.g., Bahrain, Qatar, Saudi Arabia, Egypt, and Jordan) that have subjected Islamic banks to the general law that governs all banks without specifying how investment accounts should be reported. This leaves open the accounting treatment of investment accounts within this group, so that it falls into two categories (see Fig. 1). The first category of Islamic banks have treated investment accounts as an on-balance sheet item, while those in the second category (e.g., Faysal Islamic Bank of Bahrain, Arab Islamic Bank-Bahrain, and Al Rajhi Banking and Investment-Saudi Arabia) have treated investment accounts as an off-balance sheet item. Some Islamic banks (e.g., Bahrain Islamic Bank, Qatar Islamic Bank, Jordan Islamic Bank, Faisal Islamic Bank in Egypt) in the first category that have treated investment accounts on the balance sheet have reported them as a liability, while others (Arab Banking Corporation Islamic Bank in Bahrain) have treated these accounts as part of equity.

The third approach represents a group of countries (e.g., Lebanon) that subjected Islamic banks to their “fiduciary” (i.e., investor protection) law. Islamic banks (e.g., Al-Baraka Bank-Lebanon) are required by law to treat investment accounts as an off-balance sheet item, similar to managed mutual funds (the presumed model).

Islamic banks that have treated investment accounts as a liability item would justify such a treatment on the grounds that investment accounts are more akin to deposits in a commercial bank. Such a justification is not entirely unfounded. As noted in the Section 4, in the

⁴² The International Accounting Standards Committee newsletter, *Insight* (October 1997), reported the following:

A preliminary IASC staff analysis of the responses to a 1996 survey conducted for IASC has found that 56 of 67 countries either look directly to IAS as their national standards or develop national standards based primarily on IAS (p.15).

The following countries in which Islamic banks operate are reported in the IASC survey: Kuwait, Pakistan, Malaysia, Jordan, Sudan, Iran, Tunisia, and Turkey. Although not mentioned in the IASC survey, the following countries also look directly to IASs as their national standards or develop national standards based primarily on IASs: Bahrain, Saudi Arabia, UAE, Qatar, Lebanon, and Egypt.

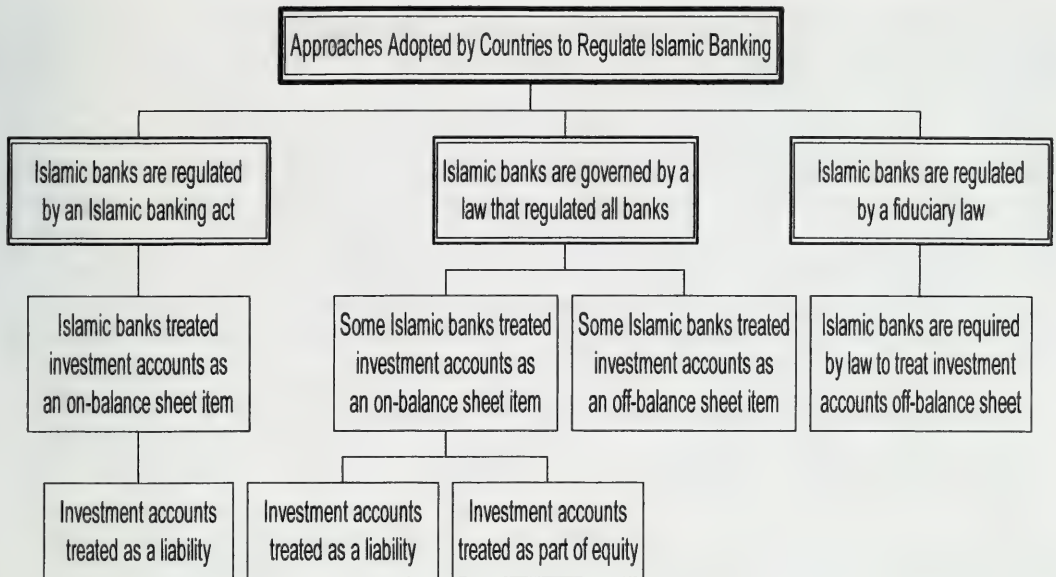


Fig. 1. Regulatory framework of Islamic banking.

Malaysian Islamic Banking Act investment accounts are referred to as “investment account liabilities.” Although the Islamic bank is not contractually liable to absorb losses, it would be under commercial pressure to meet IAH’s expectations and compensate holders of these accounts in order to maintain the bank’s reputation and goodwill.⁴³ These Islamic banks (and by implication their auditors)⁴⁴ would argue that they were accounting for the economic substance of the transaction rather than the legal form of the *mudaraba* contract.⁴⁵

Such a treatment of investment accounts would tend to satisfy the features that IASs require to be considered when deciding whether an item qualifies to be treated as a liability. According to the IASC *Framework for the Preparation and Presentation of Financial Statements*: “In assessing whether an item meets the definition of an asset, liability or equity, attention needs to be given to its underlying substance and economic reality and not merely its legal form” (IASC, 1989, paragraph 51).

⁴³ AAOIFI’s *Statement on the Purpose and Calculation of the Capital Adequacy Ratio for Islamic Banks* (AAOIFI, 1999a) takes into consideration what it terms “displaced commercial risk.” The Statement states that “An Islamic bank is liable to find itself under commercial pressure to pay a rate of return to its PSIA-holders [profit sharing investment account holders] which is sufficient to induce those investors to maintain their funds with the bank, rather than withdrawing them and investing them elsewhere” (p. 7). Furthermore, AAOIFI’s *Financial Accounting Standard No. 11: Provisions and Reserves* (AAOIFI, 1999b) requires Islamic banks to disclose any amounts paid by the Islamic bank from its *mudarib* share to investment account holders in order to increase the latter’s rate of return.

⁴⁴ A cursory examination of the annual reports of Islamic banks indicates that the “Big Five” accounting firms audit most of these banks.

⁴⁵ It is worth noting that unlike the IASC *Framework for the Preparation and Presentation of Financial Statements* (1989), AAOIFI (1993) makes no reference to the concept of substance over form.

However, the above analysis raises the fundamental issue of whether the separation between the economic substance of a transaction and its legal form is valid in the case of transactions governed by Islamic *Shari'a*. Compliance with *Shari'a* precepts is not simply a matter of form, but affects the substance of the transaction. For example, *murabaha* and *ijarah muntahia bittamleek* are distinguished from their conventional equivalents (asset-based loans and capital or finance leases) not merely by the absence of interest, but in the assumption of asset risk by the financier. In the case of *murabaha*, the financier bears the asset risk until delivery and passage of title to the customer.⁴⁶

As stated earlier in the paper, Islamic banks are driven by *Shari'a* approved contracts because they have to comply with Islamic *Shari'a* rules and principles in all their transactions:

Islamic banks were developed on a foundation that does not permit the separation between temporal and religious matters. That foundation requires compliance with *Shari'a* as a basis for all aspects of life. This covers not only religious worship but also business transactions which should comply with *Shari'a* precepts (AAOIFI, paragraph 8).

Islamic banks that have treated investment accounts as part of equity on the balance sheet have classified these accounts as participating shares or what is known as class “B” shares. According to these banks, both investment accounts and participating shares are financial instruments that are used to mobilize funds. Moreover, the economic substance of both instruments is the same, namely their return is based on that of the underlying assets. Hence, this group of Islamic banks and their auditors who have supported this treatment of investment accounts on the balance sheet would justify it on the basis of their interpretation of IAS 32, which states in the section relating to the presentation of liabilities and equity that “the issuer of a financial instrument should classify the instrument, or its component parts, as a liability or as equity in accordance with the substance of the contractual arrangement on initial recognition and the definitions of a financial liability and on an equity instrument” (IASB, 1995, paragraph 18).

Islamic banks in the above two groups that treated investment accounts on the balance sheet recorded the application of the funds of investment accounts as assets. This does not satisfy the definition of an asset under IASs. According to the IASB *Framework for the Preparation and Presentation of Financial Statements*, “an asset is a resource controlled by the enterprise as a result of past events and from which future economic benefits are expected to flow to the enterprise” (IASB, 1989, paragraph 49(a)). However, the control and use of assets represented by investment accounts result in a flow of future economic benefits to the Islamic bank only in the form of the *mudarib* share, which may have a lower bound of zero.

Islamic banks that have treated investment accounts as an off-balance sheet item would argue that the nature of these accounts is similar to that of funds under management. Put another way, these Islamic banks would suggest that investment accounts should be accounted for from the perspective of the investment management function performed by Islamic banks. These Islamic banks would support their argument by claiming that their

⁴⁶ For *ijarah muntahia bittamleek* see footnote 48.

accounting treatment of these accounts was based on their (and by implication their auditors') interpretation of IAS 30. According to IAS 30, if a bank acts in a fiduciary capacity that results in the holding or placing of assets on behalf of individuals, then these assets are not the assets of the bank and, therefore, are not included in its balance sheet.⁴⁷ This reasoning is applied not just to restricted investment accounts, but also to unrestricted investment accounts.

However, informed market players would question such a treatment of unrestricted investment accounts, thereby casting doubt on both the relevance of IASs for Islamic banks and the auditors' opinion on the financial statements of these banks. For example, the 1995, 1996, and 1997 financial statements of Faysal Islamic Bank-Bahrain (FIBB) are audited by Price Waterhouse who has issued an unqualified opinion and stated that the accounts are in accordance with IASs. Yet, in December 1996 Capital Intelligence, one of the few rating agencies that rate a number of Islamic banks, qualified its rating of FIBB. Capital Intelligence (1997) states that its qualification of FIBB was "due to the large degree of uncertainty concerning the effect the transfer of off-balance sheet unrestricted investment accounts to the balance sheet (in compliance with the introduction of [AAOIFI's] Islamic Financial Accounting Standard (IFAS) No 1), would have on the Bank's liquidity and capital adequacy ratios" (p. 3).

Capital Intelligence (1998) further claims that in its opinion, "the supplementary information [presented by FIBB based on AAOIFI's standards] enables one to form a more accurate picture of the financial health of FIBB. For example, under the new accounting treatment (including unrestricted investment accounts on balance sheet)...profitability ratios such as return on average assets become more meaningful (2.06% as opposed to 6.4% using IAS)... Thus in analyzing the composition of FIBB's asset structure, we have assumed unrestricted investments to be part of the Bank's balance sheet, since they have a direct effect on the Bank's liquidity and profitability and give a more accurate reflection of the magnitude of business operations" (p. 3).

On the other hand, since IASs do not provide specific guidelines for the accounting treatment of investment accounts (as well as other Islamic financial instruments),⁴⁸ they may have provided Islamic banks with an opportunity to choose the accounting treatment that satisfies their objectives. For example, the treatment of investment accounts as an off-balance

⁴⁷ IAS 30, paragraph 55.

⁴⁸ For example, *ijarah muntahia bittamleek* (a lease contract that ends up with the transfer of ownership of leased assets to the lessee). Prior to the promulgation of AAOIFI's Financial Accounting Standard No. 8: *Ijarah and Ijarah Muntahia Bittamleek*, most Islamic banks that used IASs accounted for this financial instrument as a finance lease. However, contrary to the requirements of IASs, the *Shari'a* precepts that govern this financial instrument do not allow for the substantial transfer of all significant risks and rewards from the Islamic banks as lessors to the lessee. Some Islamic banks presented the assets of this financial instrument on their balance sheet as leased assets while other Islamic banks presented them as receivables. However, Islamic banks that presented these assets as leased assets did not deduct any amount for their depreciation possibly based on the Islamic banks' interpretation of IAS 16: *Property, Plant and Equipment* (revised 1993), thereby overstating their reported profit. On the other hand, the accounting treatment of this financial instrument as receivables may benefit the Islamic bank if the provision for doubtful debts would be less than the amount that would be provided for depreciation if they were treated as leased assets.

sheet item would appeal to the Islamic banks that considered it was not in their interest to have these accounts included in the calculation of their capital adequacy ratio in order not to be asked to increase their equity capital.⁴⁹ Another possible reason that would make this treatment appealing to these banks is that it enables them to hide negative information relating to investment accounts, especially losses due to misconduct or negligence. In this respect it should be noted that IASs are silent on the disclosure of losses incurred in the investment portfolio funded by investment accounts.

The external auditors of these Islamic banks would also have a vested interest in supporting the off-balance sheet treatment of these accounts. Since external auditors may not be directly responsible for making a full audit of off-balance sheet items, this treatment would reduce the risk of legal liability to which they would be exposed. Hence, losses due to misconduct or negligence, which according to the *mudaraba* contract should not be borne by IAHs, may go undetected.

Given that, in the majority of Islamic banks, investment accounts represent a very high percentage of the total balance sheet funding, Islamic banks that have treated investment accounts on the balance sheet may have given more consideration to the size of their balance sheet totals. However, since the balance sheet model based on IASs and other accounting standards assumes that funds can only be mobilized through debt and/or equity, this group of Islamic banks had no choice but to treat investment accounts either as a liability or as equity depending on whether they treated these accounts as deposits or as an unsecuritized equity or, in rare cases, securitized financial instrument, respectively.

The theme emerging from the preceding analysis suggests that although the three different accounting treatments of investment accounts tended to be based on each group's interpretation of the IAS that was believed to be relevant to the *mudaraba* contract, these treatments rendered the financial statements of Islamic banks noncomparable. This draws attention to the fact that IASs are insufficient to cater for the unique characteristics of the financial instruments used by Islamic banks. Karim (1996a) gives support to this proposition by arguing why accounting standards (e.g., IASs) developed for secular business organizations are of limited applicability to Islamic banks.

The above implies that the use of IASs as a vehicle for achieving international harmonization of financial reporting will not be effective in making financial reporting by Islamic banks more comparable, and may have the opposite effect because of the "slack" resulting from the inadequate "fit" of IASs to Islamic transactions. It also provides a case for regulating the financial reporting by Islamic banks by reference to accounting standards that cater to the unique characteristics of the financial instruments used by Islamic banks, in order to make the financial statements of these banks more comparable.⁵⁰ This lends support to the theoretical proposition that the factor of culture, namely religion, would influence the international harmonization of accounting and financial reporting.

⁴⁹ In some of the largest Islamic banks the shareholdings are concentrated in a few hands, for example, Dar-Al-Mal Group, Dalla Albaraka Group, and Al Rajhi Corporation for Banking and Investment.

⁵⁰ See Karim (1996a) for other attributes of the *mudaraba* contract, namely economic consequences which are a central feature that is embodied in the rules of this contract, but are not recognized in the conceptual framework of the IASC.

6. Concluding remarks

Islamic banks are established with a mandate to adhere to Islamic *Shari'a* rules and principles in all their transactions. The majority of Islamic banks perform both commercial and investment banking services. However, unlike conventional commercial and investment banks, Islamic banks do not establish firewalls to separate legally, financially, and managerially these two services. Rather, the majority of Islamic banks commingle their own funds with those of IAHs, invest both funds under the bank's management in the same investment portfolio, and report these investments and their results in the bank's balance sheet and income statement.

Supervisory authorities in countries in which Islamic banks operate have taken various approaches to regulate Islamic banking. These include promulgating Islamic banking acts to regulate Islamic banks, subjecting Islamic banks to existing fiduciary laws, and regulating Islamic banks by the laws that govern all banks. The paper suggests that the perspective adopted by the supervisory authorities to regulate Islamic banking tended to influence the accounting treatment of investment accounts adopted by Islamic banks, although most of the countries in which these banks operate either look directly to IASs as their national standards or develop national standards based primarily on IASs. This has rendered the financial statements of Islamic banks noncomparable.

The above implies that the calls to use IASs as a vehicle to achieving international harmonization of financial reporting must not go unchallenged, so far as Islamic banks are concerned. Rather, the case of Islamic banks casts light on the need to develop and implement accounting standards that specifically cater for the unique characteristics of the contracts that govern the operations of these banks.

In fact, Islamic banks have gone a long way towards achieving this objective. In 1990, AAOIFI was established to prepare and promulgate accounting, (and recently) auditing and governance standards. To date, AAOIFI has issued 14 accounting standards, including two statements that represent a conceptual framework that guides the preparation of its standards. In addition to market pressures for compliance coming from international credit rating agencies, the supervisory authorities in both Sudan and Bahrain have required Islamic financial institutions to comply with AAOIFI's standards. Efforts are underway in other countries (e.g., Malaysia, Qatar) that may result in adherence to standards based primarily on AAOIFI's standards. Some Islamic banks (e.g., Bank Islam Berhad Malaysia, Islamic Development Bank) have also started to voluntarily use AAOIFI's accounting standards to prepare their financial statements.

However, there seem to be several factors that have contributed to the low implementation of AAOIFI's standards in the countries in which Islamic banks operate. These include, among others, the lack of appreciation by the relevant agencies that are responsible for enforcing accounting standards of the benefits that can be gained by implementing AAOIFI's standards, namely (a) rendering the financial statements of Islamic banks comparable and transparent; and (b) providing relevant and reliable information to users of financial statements of Islamic banks. This would require AAOIFI to exert more efforts to have its standards recognized by an increasing number of countries.

The broad acceptance for AAOIFI's standards will tend to challenge the call for worldwide adherence to IASs to achieve international harmonization in financial reporting regardless of cultural differences. They also raise the issue of what collaborative relationship could productively be established between specialized regulatory bodies such as AAOIFI, and "general purpose" regulatory bodies such as the IASC, IOSCO, and the Basle Committee on Banking Supervision.

Acknowledgments

The author would like to acknowledge the helpful comments of Simon Archer and two anonymous referees on an earlier draft. The usual caveats apply.

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Pergamon

The International Journal of Accounting
36 (2001) 195–222

**The
International
Journal of
Accounting**

A six-country comparison of the use of graphs in annual reports

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Abstract

This study contributes to each of knowledge of comparative international reporting practices by exploring an aspect of the annual report package not previously researched from a transnational perspective. The financial graphs in the corporate annual reports of 50 companies in Australia, France, Germany, The Netherlands, the UK, and the US are investigated using an established methodology. We conclude that companies in different countries adopt significantly different graphical practices, with German graphical practice being especially different. Findings with regard to selected graphical reporting dimensions are not generally consistent with predictions based on the macro/micro-orientation of countries. © 2001 University of Illinois. All rights reserved.

Keywords: Annual reports; Comparative international accounting; Financial graphs

1. Introduction

The globalization of international markets, with the concomitant increase in the importance of international investment, necessitates further research to enhance our understanding of comparative international financial reporting practices. These practices concern measurement, disclosure, and presentational issues. At the national level, the different accounting environments caused by divergent factors have been studied extensively. Nobes (1983), for example, classifies national accounting environments into two broad hierarchical divisions: macro-continental accounting practices (e.g., France and Germany) and micro-Anglo Saxon practices (e.g., the US, the UK, and the Netherlands). More recently, Salter and Niswander

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(1995) test Gray's (1988) theory that cultural factors determine different patterns of accounting in different parts of the world. Much less attention, however, has been paid to the financial reporting practices of individual companies in a comparative international context. Consequently, very little evidence exists as to whether the actual practices followed by companies confirm their national classification.

This neglect of transnational research into the reporting practices of individual companies is particularly true in the area of voluntary reporting practices that reveal transnational managerial preferences for reporting financial information. Further research into voluntary reporting practices will enable a better understanding and appreciation of different managerial cultures across countries. This article focuses upon one particular aspect of voluntary reporting, financial graphs.

Financial graphs offer companies an alternative method of presenting financial information to the traditional alphanumeric table and continuous narrative text formats. Financial graphs are particularly attractive to management as presentational formats, since they have several important advantages. First, graphs, by their very nature, attract the reader's attention. Much of the presentation of information in an annual report is dictated by regulatory requirements, such as those from the Securities and Exchange Commission (SEC) in the US and the London Stock Exchange in the UK. Graphs, however, are a voluntary presentational medium that may be used either to summarize or to present mandatory or voluntary information. Graphs often repeat, in an attractive and accessible format, information that is presented elsewhere in the annual report in tabular form. Such redundancy reflects the importance placed by management upon these messages (Lothian, 1976). Moreover, differences in visually perceptible properties, such as length of column or color, are readily detected (Kosslyn, 1994). Graphs, which are not regulated, can be used to add color, interest, and originality to an otherwise tightly controlled financial document. In short, they can enliven the presentation of the corporate annual report.

Second, graphs are memorable. Pictorial and graphical representations are remembered more easily and accurately than numbers (Leivian, 1980). As Kosslyn (1989) and Lewandowsky and Spence (1989) observe, graphs effectively exploit the natural perceptual, cognitive, and memory capacities of individual readers. Third, graphs are very effective at communicating financial information. In effect, they summarize and distil data trends and identify numerical relationships. As Pinker (1990, p. 73) comments, "[a] striking fact about human cognition is that we like to process information in graphic form." Typically, corporate annual reports are primarily concerned with a company's performance over time. Graphs, especially column graphs, are able to portray this information simply and effectively. Patterns, trends, relationships, and anomalies become more apparent, facilitating comparisons and projections (Harris, 1996). For the unsophisticated reader, in particular, they may permit easier understanding than the traditional financial statements. Fourth, graphs are able to capture the essence of a company's performance by highlighting a few key financial indicators such as sales, earnings, earnings per share (EPS), dividends per share (DPS), cash flow, and return on capital employed (ROCE).

These communication advantages of graphical presentation are being appreciated increasingly by corporate management worldwide. In addition, financial graphs, being voluntary, potentially allow management partially to control the disclosure process. As management

realize this and exploit the annual report's potential as both a major public relations and promotional opportunity as well as a regulated document (Hopwood, 1996), there is a concomitant growth in the incidence of companies using graphs. A substantial majority of large US and UK companies now use graphs and present them prominently in their annual reports (e.g., Beattie & Jones, 1997; Steinbart, 1989). In an international context, graphs are particularly useful since they constitute a readily understood, largely language-independent, communication medium.

Despite the popularity of graphical usage, academic research into the use of graphs in corporate annual reports is still in its infancy. We know of only eight systematic, empirical published studies, with each study typically relating to only one country. This lack of research, especially at the transnational level, is disappointing, since the study of graphs may provide potentially rich insights into managerial preferences for information disclosure.

In this study, we document for the first time the graphical reporting practices of companies in six selected major countries of key importance to the study of international accounting. We summarize the findings of a systematic study of 300 annual reports, comprising the top 50 companies for six important countries worldwide: Australia, France, Germany, The Netherlands, the UK, and the US. General graphical information (for example, the frequency of graph use, the variables selected, and the graphical formats chosen) is collected.

We conduct our research in two stages. In the first stage, we identify significant transnational variations in graphical practice. Then, in the second stage, we investigate whether these differences can be explained by differences in national accounting environments. To do this, we looked at two broad theories of differences used previously by international accounting researchers: micro/macroclassification theory (Nobes, 1983) and the cultural influence theory (Gray, 1988). Hypotheses, based on the macro/microcountry classification, are developed and tested.

The remainder of this paper is presented in four sections followed by a conclusion. Section 2 reviews two distinctly different, but pertinent, literatures: the previous single-country studies into financial graphs and the theories of international accounting differences. On the basis of these literatures, a series of five parallel hypotheses are developed concerning the existence and nature of intercountry differences in graphical formatting choices. In Section 3, we outline the methods used in this study. Section 4 presents our results. Having first established that there are differences between countries, we attempt to explain them using the micro/macroaccounting classificational framework. A discussion follows in Section 5. Finally, Section 6 summarizes and concludes.

2. Prior literature and hypotheses

2.1. Single-country financial graphs studies

We are aware of only one previous international comparison of financial information using graphs (Beattie & Jones, 1997). This study is significant in that it compares more than one country: the UK and the US. However, these countries have similar accounting systems,

resulting in little diversity of practice. There are, in addition to Beattie and Jones (1997), seven single-country, empirical studies of graphical formatting choices in corporate annual reports (in the US, Johnson, Rice, & Roemmich, 1980; Steinbart, 1989; in the UK, Beattie & Jones, 1992a, 1992b; in Ireland, Green, Kirk, & Rankin, 1992; in Canada, Canadian Institute of Chartered Accountants, 1993; and in Australia, Beattie & Jones, 1999; Mather, Ramsay, & Serry, 1996). We provide a summary of the key features of these studies in Table 1.

As Table 1 shows, there is much commonality in the findings of the seven studies. All focused in general upon large listed companies. Graph usage for these companies was consistently high, except in Ireland where only 54% of semistate and public limited companies used graphs. Across Australia, Canada, the UK, and the US, graph usage ranged from 73% in Australia (Mather et al., 1996) to 92% in the US (Beattie & Jones, 1997). Clearly, management tends to see graphs as a standard component of their annual financial reporting package.

The mean number of graphs used also indicates that graphs are widely used. Except, for the very high mean usage found by Beattie and Jones (1997) in the US, the mean number of graphs used ranged from 5.9 in the UK (Beattie & Jones, 1992a,b) to 9.4 in Australia (Beattie & Jones, 1999).

Finally, turning to the most frequently graphed variables, there is again a broad consistency, especially for Australia, UK, and the US. All are financial measures. Income

Table 1
Summary of key features of financial graphs literature

	Country	Companies studied	Graph usage (%)	Mean number of graphs	Most frequently graphed variables
Johnson et al. (1980)	US	125 graphs from 50 Fortune 500 annual reports for 1977 and 1978	Not reported	8.5	Not given
Steinbart (1989)	US	319 Fortune 500 annual reports for 1986	79	8.0	Sales; net income; dividends
Beattie and Jones (1992a,b)	UK	240 large companies in 1989	79	5.9	Sales; earnings before tax; EPS; DPS
Green et al. (1992)	Republic of Ireland	117 semistate sector and public limited companies (year not given)	54	6.0	Not given
Canadian Institute of Chartered Accountants (1993)	Canada	200 companies in 1991	83	8.4	Sales earnings; shareholders' equity; assets
Mather et al. (1996)	Australia	(a) 43 top Australian listed and (b) 44 not-for-profit entities for 1991 and 1992	a, 83; b, 73	Not given	Sales; earnings; EPS; dividends
Beattie and Jones (1997)	UK/US	176 leading companies, 1990 annual reports	UK, 80; US 92	UK, 7.7; US, 13.0	Sales earnings; EPS; DPS
Beattie and Jones (1999)	Australia	89 leading Australian listed companies	89	9.4	Sales earnings; EPS; DPS

statement measures, such as sales, earnings (net income and EPS), and dividends (DPS) predominate. In Canada, however, two balance sheet measures (shareholders' equity and assets) are also important (Canadian Institute of Chartered Accountants, 1993).

Overall, therefore, our summary of the findings of the prior studies suggests that there is a high degree of conformity in graph usage across important developed countries. In particular, graphs are widely used and numerous with the emphasis being on sales, earnings, and dividends graphs.

2.2. Theories of international accounting differences

The prior literature on international accounting indicates that there are different patterns of accounting internationally (see, for example, Gray, 1988; Wallace & Gernon, 1991). Unfortunately, the prior literature throws little light upon the reasons for observed differences. To identify a framework within which to investigate this issue, we explored both Nobes' (1983) judgmental classification of international accounting systems into micro-Anglo Saxon practices and macrocontinental accounting practices and Gray's (1988) theory of cultural influence in accounting.

Nobes (1983) builds on earlier attempts (for example, Mueller, 1967, 1968; Seidler, 1967) to classify accounting systems based on intuitive examination. In particular, Nobes (1983) criticized work by Nair and Frank (1980) and others who attempted to analyze statistically financial reporting practices using data originally compiled by Price Waterhouse International (1973, 1975, 1979). Nobes attempted to build a hierarchical classification of accounting systems based on expert knowledge. His solution proposed a broad twofold classification comprising micro- and macroaccounting practices.

Microbased accounting practices are generally characterized by comparatively weak governmental influence on accounting, relatively strong accounting professions, and comparatively active equity markets. The focus is on measuring the net worth and earnings of the firm for the benefit of the external stakeholders. In contrast, macroaccounting practices are generally characterized by comparatively strong governmental influence on accounting, relatively weak accounting professions, and comparatively inactive equity markets. Accounting practices are legalistic and tax-based, tending to be uniform and inflexible. Mueller, Gernon, and Meek (1991) refer to countries with macrobased accounting systems as 'code law countries.' Based on this classification, four of the countries covered in the present study have a microorientation (Australia, the Netherlands, the US, and the UK) while two have a macroorientation (France and Germany; Nobes, 1983). Nobes' classification is reinforced by Zysman's (1983) research into credit and capital market-based systems. Moreover, Doupnik and Salter (1993, 1995) and Salter and Doupnik (1992) find empirical support for a two-cluster solution that corresponds broadly to Nobes' classification. Australia, the Netherlands, the UK, and the US are all microcountries, while France and Germany are macrocountries.

Gray's (1988) theory of cultural influence in accounting is based on Hofstede's (1980) generic cross-cultural research, which explored four societal values (termed Individualism, Power Distance, Uncertainty Avoidance, and Masculinity) across 40 countries. In short, Gray seeks to explore and explain accounting values and systems using cultural constructs. Perera

and Hector (1989) provide a useful review of both studies. In an invited keynote paper presented at the 1986 American Accounting Association, Hofstede states that Power Distance and Uncertainty Avoidance are the two societal values “most relevant for the functioning of organizations” (p. 7). In particular, “from a cultural point of view, accounting systems in organizations are best understood as uncertainty reducing rituals, fulfilling a cultural need for certainty, simplicity, and truth in a confusing world regardless of whether this truth has any objective basis” (p. 4).

Gray (1988) uses Hofstede’s (1980) work to set four accounting values: two related to authority and enforcement (Professionalism and Uniformity) and two related to measurement and disclosure (Conservatism and Secrecy). The latter two dimensions, particularly secrecy, are most relevant to this particular study, with secrecy relating principally to disclosure and conservatism relating principally to measurement. A preference for secrecy is consistent with strong uncertainty avoidance following from a need to restrict information disclosures so as to avoid conflict and competition and to preserve security (Gray, 1988, p. 11). Thus, one might expect ‘secretive countries’ to display less graphs, particularly of key financial information.

In both Gray (1988) and Hofstede (1986), the dimensions are represented graphically along two axes and individual countries are plotted (Hofstede: Power Distance vs. Uncertainty Avoidance; Gray: Conservatism vs. Secrecy). In both cases, Australia, The Netherlands, the UK, and US (the four microcountries considered in the present study) are plotted close together in one quadrant. By contrast, France and Germany (the two macrocountries considered in the present study) are grouped together in one quadrant by Hofstede and in two different quadrants by Gray. Thus, as with the Nobes’ classification, the microgrouping appears more homogeneous than the macrogrouping.

Salter and Niswander (1995) test Gray’s (1988) theory using data from 29 countries. The theory is best at explaining actual financial reporting practices rather than professional and regulatory structures. Gray’s four accounting values were generally significantly related to only one of Hofstede’s (1986) constructs (Uncertainty Avoidance), with a particularly strong association to Secrecy. This suggests that Hofstede was right in describing Uncertainty Avoidance as a key dimension for accounting.

Collectively, these studies do, however, confirm that, from a cultural perspective, Nobes’ macro/microclassification does have broad validity. Interestingly, the countries in the micro-group are once again found clustered more tightly than those in the macrogroups (Doupnik & Salter, 1993, 1995), indicating that their accounting practices are likely to be more homogeneous. At the most detailed nine-cluster solution, Australia, the Netherlands, and the UK are all still clustered together in the same group. Meanwhile, the macrogroup splits into seven groups.

2.3. Hypotheses

A set of exploratory research hypotheses was developed from our consideration of the accounting graphics and theory of differences literatures. We first explore whether differences exist (Hypotheses 1a, 1b, 1c, 1d, and 1e). In the second stage, we investigate the extent to which the macro/microclassification is able to explain observed differences. These hypotheses (stated in alternative form) reflect our prior expectation that different countries’ patterns of graph usage

will reflect persistent differences. Our research is thus congruent with the wide sweep of international accounting research that focuses on cross-national similarities and differences (Gernon & Wallace, 1995). The existence of these differences is explored over a range of graphical reporting dimensions (presence of graphs, presence of key performance variable (KPV) graphs, choice of topics, prominence of graphs, and length of time series graphed). We classify any time-series performance-related variable graphed by over 25% of companies in a country as a KPV. We state our five hypotheses (Hypotheses 1a, 1b, 1c, 1d, and 1e) below:

Hypothesis 1a: The degree to which graphs are used or not used by companies will vary between countries both in terms of (i) any financial or nonfinancial variable and (ii) at least one KPV graph.

Hypothesis 1b: The degree to which companies graph specific KPVs will vary between countries.

Hypothesis 1c: The choice of topics graphed by companies will vary between countries.

Hypothesis 1d: The degree to which graphs are displayed prominently will vary between countries.

Hypothesis 1e: The length of the time series graphed by companies will vary between countries.

We next address the issue of *why* companies in different countries would be expected, a priori, to use graphs in systematically different ways. As a broad framework, we use the macro/microclassification. Overall, we predict that companies in microbased countries will exhibit different patterns of graph usage from companies in macrobased countries, with these differences in financial presentational practices arising, at least partially, from the same factors that result in different accounting measurement and disclosure practices. In particular, we refer to Douppnik and Salter (1993, 1995) who compare the disclosure practices of companies in macro- and microcountries. Douppnik and Salter (1993) find that across 41 disclosures, microcompanies tended to disclose more than macrocompanies. Therefore, we expect that the extent of graphical reporting in microcountries, in general, will be greater than that in macrocountries.

More specifically, external financial reporting is likely to be geared towards the needs of ‘outsiders’ rather than ‘insiders’ (Nobes, 1998). In microbased countries, accounting is thus likely to be geared towards the needs of outsider stockholders. In macrobased countries, insider lenders dominate. They are thus less likely to demand extensive levels of financial information.

In microbased countries, accounting is also likely to be geared towards the needs of stockholders, whereas in macrobased countries, the needs of other external users (such as banks and creditors) are likely to dominate. These other external users have more extensive alternative channels of financial communication to the corporate annual report. Thus,

Hypothesis 2a: Graphs of (i) any financial or nonfinancial variable and (ii) at least one KPV graph are more likely to be included in the corporate annual reports of companies in microbased countries than in those in macrobased countries.

Companies in microbased countries are also likely to be keener than those in macrobased countries to communicate performance data to enable stockholders to assess more fully the financial performance of the company. In addition, external financial reporting in microbased countries is particularly focused on the external investor and upon the needs of the equity market. Thus,

Hypothesis 2b: Graphs of KPVs are more likely to be included in the corporate annual reports of companies in microbased countries than in those in macrobased countries.

The priorities of management in microbased countries will differ from those in macrobased countries, resulting in a different set of topics being graphed. In particular, companies in microcountries will be more likely to communicate financial investor-oriented information than companies in macrocountries. By contrast, companies in macrocountries will be more likely to communicate nonfinancial data (social, employee, and environmental), which are of less interest to stockholders. Thus, we develop 2c, 2ci, and 2cii.

Hypothesis 2c: There will be differences in the choice of topics graphed between companies in microbased countries and those in macrobased companies.

In particular,

Hypothesis 2ci: Companies in microbased countries will be more likely than companies in macrobased countries to include graphs of financial information.

Hypothesis 2cii: Companies in macrobased countries will be more likely than companies in microbased countries to include graphs of nonfinancial graphs, particularly on social, employee, and environmental data.

Companies in microbased countries will be keener to emphasize their performance data by locating KPV graphs more prominently within the annual report than companies in macrobased countries. In addition, this conforms to the cultural tenet of Secrecy, whereby the microcountries scored higher in Uncertainty Avoidance and thus would be expected to be more up-front in their presentation of key data. Thus,

Hypothesis 2d: KPV graphs in the annual reports of companies in microbased countries will be presented more prominently than those in macrobased countries.

Microbased countries' financial reporting is geared towards equity investors who are generally considered to be interested in short-term financial performance rather than long-term gain. Thus,

Hypothesis 2e: The annual reports of companies in microbased countries are likely to contain KPV graphs displaying relatively shorter time series than those in macrobased countries.

In summary, we expect the annual reports of companies in microbased countries to be more likely to include (1) graphs per se, (2) KPV graphs, and (3) graphs of other financial

variables and (4) to display their graphs more prominently and (5) to include graphs covering a shorter time period. However, they will be less likely to graph nonfinancial variables (such as social, employee, and environmental graphs).

3. Methods

The six countries selected as the basis for this study were Australia, France, Germany, the Netherlands, the UK, and the US. These countries were chosen because of their importance in any consideration of international accounting. Five of these six countries (France, Germany, the Netherlands, the UK, and the US) have long been recognized, on the basis of economic and accounting factors, as being vital countries' for the study of comparative international accounting (Mason, 1978, p. 40; Nobes & Parker, 1998, p. 13). In addition, Australia was included because of its international economic importance and because of the emerging importance of the Pacific Rim countries (Cooke & Parker, 1994). Our country selection thus includes representatives of the two major international taxonomical groups: macro (France and Germany) and micro (Australia, the Netherlands, the UK, and the US).

Extel Financial identified the top (by market capitalization) 100 domestically listed-only enterprises in 1993 for five of the countries: France, Germany, the Netherlands, the UK, and the US. We requested that Extel exclude cooperatives, nationalized industries, and financial companies, such as banks and building societies, since a previous study of graphical practices (Beattie & Jones, 1992a) demonstrates that such companies have different graphical reporting practices to nonfinancial, independently operated companies. In addition, we requested that Extel exclude companies with external debt listings on foreign exchanges, as we felt that having an external debt listing might make a company more inclined to adapt its annual report for a foreign audience and we wished to focus on those companies most likely to adopt distinctive national reporting practices. In essence, therefore, our aim was to focus on important domestic, nongovernmental enterprises in order to highlight transnational graphical differences. This distinguishes our study from other comparative international studies of voluntary disclosure which have focused upon multinational companies (for example, Meek & Gray, 1989; Roberts, 1990). We concentrated upon the 'top' enterprises because of their economic significance and because we believe that these companies are market leaders in corporate communication. The Australian companies were drawn from the top (by market capitalization) listed 100 Australian companies as of 31 December 1992 (Australian Stock Exchange, 1992).¹

Companies were requested to supply a copy of both their 1992 report published for domestic users and the supporting English translation (where appropriate and available). To secure an effective sample size of 50 companies for each country, we selected the top 50

¹ Once again, we focused on industrial, nonfinancial companies. However, strict comparability with the Extel listings was not achieved, since we *did not* sample domestically listed-only companies and our Australian sample consisted of 1991, not 1992, annual reports. These minor differences in our sampling frame must be borne in mind when interpreting our results. Australia was substituted for the country of our original choice, Japan, as we encountered data collection problems for the Japanese companies.

qualifying enterprises, which responded to our request.² For Australia, a sample of 89 out of the top 100 annual reports for 1991, collected by Beattie and Jones (1999), was used from which we selected the top 50 nonfinancial companies.

To ensure the relevance and completeness of the data checklist, the authors designed it with reference to the prior statistical graphics literature (especially Cleveland, 1985; Kosslyn, 1989, 1994; Schmid 1983; Schmid & Schmid, 1979; Tufte 1983) as well as with reference to prior empirical studies of financial graphs (especially Beattie & Jones, 1992a,b). The checklist was pilot-tested initially on 10 companies' annual reports to check for clarity and lack of ambiguity and then revised. A two-stage data collection process was conducted in order to identify the KPVs in each country. The study initially focused upon the four KPVs (sales, earnings, EPS, and DPS) that were found by Beattie and Jones (1992a,b) to be important in the UK context. However, after data relating to the incidence with which all topics were graphed had been collected, the checklist was amended to collect additional data on any time-series performance variable graphed by over 25% of companies (i.e., 13 or more) in each country.³ Two additional KPVs were identified: ROCE for the US and cash flow for France and The Netherlands. We do not provide explicit definitions of these variables as we simply adopted the terms used by the companies themselves to label the graphs. Various categories of data were extracted from the 300 annual reports by a research assistant (a professionally qualified accountant) and entered into the data checklist: company details, the number of graphs, the topics graphed. In addition, for KPVs, the graph type used, the time period graphed, and their location within the corporate annual report were entered. The data checklists were then checked for completeness and accuracy, coded, and analyzed by one of the authors.

We tested our hypotheses in two stages. First, we conducted chi-square (χ^2) tests on our data to establish whether observed country differences were statistically significant (Hypotheses 1a, 1b, 1c, 1d, and 1e).⁴ Second Hypotheses 2a, 2b, 2c, 2d, and 2e, which make specific predictions concerning the nature of transnational differences, were tested using both χ^2 for

² Each company's annual report was scrutinized to ensure that the company satisfied our sample requirements and that the annual report was the original domestically produced report for nonfinancial, nonholding companies. In addition, we attempted to eliminate companies which were known subsidiaries of foreign and domestic companies. The only country for which this proved difficult was France. Many of the listed companies on the French Bourse are subsidiaries of larger French companies and prepare accounts for their minority shareholders. In order to maintain the French sample size at 50, we retained three of these subsidiary companies.

³ Although the generic form of the variables remains the same, the precise definition varies from country to country. Thus, for example, profit before tax is most commonly graphed earnings variable in the UK, while in the US, net income/earnings (profit after tax) dominates.

⁴ The degrees of freedom [*df*] for the χ^2 on individual variables is 5. For Tables 2 and 3, the individual variables' χ^2 statistics were based on equal sample sizes with uniform expected values for each country. This is the most logical assumption, given that the initial sample sizes of 50 companies per country were the same. For Tables 4 and 5, given unequal sample sizes, the expected values for individual variables were nonuniform. If the expected value of more than 20% of cells was less than 3 or any of the cells' expected values was less than one, then the tables were collapsed. This is broadly in line with Siegel and Castellan (1988, p. 123). However, following Silver (1992), we use Lawal's (1980) recommendation that tables should be collapsed when the critical value of cells is 3 rather than Siegel and Castellan's very conservative 5.

the whole data set and the two-sample proportion *t* test for individual variables (macro and micro, representing the two sample groups; Clarke & Cooke, 1983).

4. Results

4.1. Graph use

Across the six countries, 263 (88%) of the companies studied included graphs in their annual reports. In total, there were 2364 graphs, including 515 KPV graphs across 196 companies. The incidence of graph use (any financial or nonfinancial variable) in the annual reports for each country was consistently very high, ranging from 92% of companies in Australia to 82% in the UK (see Table 2 and Fig. 1). The three countries with the highest percentage of companies using graphs were Australia, The Netherlands, and the US. This overall consistency led to a lack of significant association between graph usage and individual countries (Hypothesis 1ai) and between graph usage and the macro/microclassification (Hypothesis 2ai). Across the whole sample, 65% of companies used *at least one* KPV. French and Dutch companies were the highest users of KPVs (80%), while German companies used the least (28%), reflecting wide intercountry variation. Evidence was found of a statistical

Table 2
Incidence of graph use in the annual reports of 50 large listed companies in six countries

Variables graphed ^a	Australia (%)	France (%)	Germany (%)	Netherlands (%)	UK (%)	US (%)	Country effect and 1b; χ^2 ^b (two-tailed)	Micro/macroeffect (Hypotheses 2a and 2b; <i>t</i> ^c (one-tailed))
Any financial or nonfinancial variable	92	88	84	90	82	90	0.43	0.62
At least one KPV graph	76	80	28	80	50	78	17.85**	2.92**
Specific KPV graphs								
Cash flow	14	54	16	44	2	18	40.16***	-2.94**
DPS	34	32	6	20	34	48	17.76**	2.70**
EPS	40	34	2	34	32	54	22.24***	3.83***
Earnings	66	68	8	70	44	50	27.20***	3.18***
ROCE	24	4	0	20	6	34	30.46***	4.39***
Sales	38	68	28	64	40	54	12.87*	0.16

^a KPVs are those graphed by at least 25% (13 or more) of companies in a given country. However, to aid interpretation of the data, all instances of any of these variables are recorded here even when under 25%.

^b Cramer's *V* ranged from 0.13 to 0.37 for the significant variables.

^c These are the results using the two-sample proportion *t* test. A negative sign indicates that the proportion of macrocountries graphing these topics was greater than the comparable proportion of microcountries and vice versa.

* Significant at .05 level.

** Significant at .01 level.

*** Significant at .001 level.

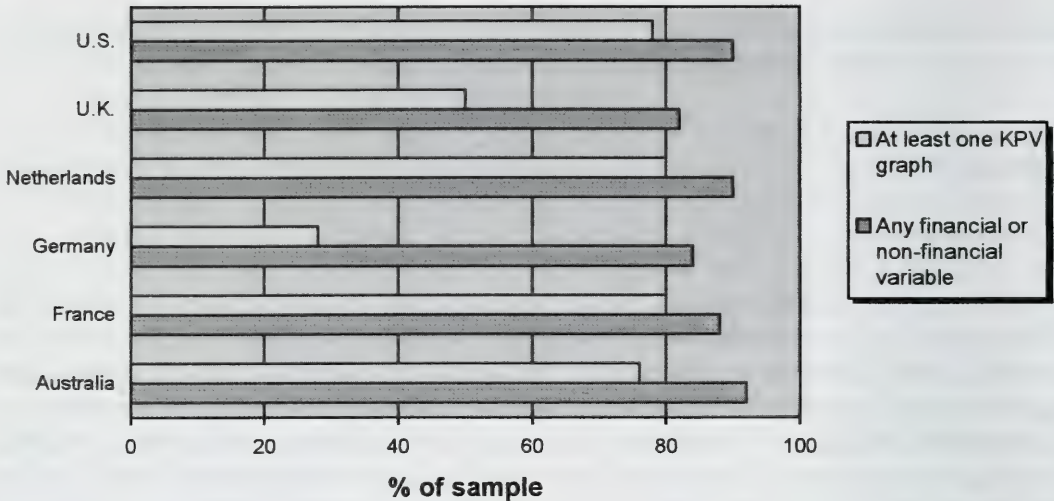


Fig. 1. Incidence of graph use in the annual reports of 50 large listed companies in six countries.

association between individual countries and the use of *at least one* KPV ($\chi^2=17.85$; significant at the .01 level) and between the macro/microclassification and the use of *at least one* KPV ($t=2.92$; significant at the .01 level). Hypotheses 1a_{ii} and 2a_{ii} are supported.

Turning to individual KPV graphs, sales was the only performance variable to be classed as a KPV in every country studied. Earnings and EPS, however, were KPVs in all countries except Germany. Cash flow was a KPV in only two countries, being graphed by 54% and 44% of French and Dutch companies, respectively. The US was the only country where ROCE was classed as a KPV. The US and France were the only countries where companies graphed five out of the six KPVs. German companies, however, graphed only one KPV, sales. In only three instances were specific KPVs graphed by over two-thirds of a national sample: earnings in The Netherlands and sales and earnings in France.

Testing the statistical significance of this variation, an overall association was found between specific KPV graph usage and country across the set of six KPV graphs ($\chi^2=77.36$, $P_{.001}=52.62$, $df=25$). Moreover, each of the six individual KPVs was significant at the .05 level or above (see Table 2, second last column), with cash flow, EPS, earnings, and ROCE all significant at the .001 level. Hypothesis 1b was, therefore, supported.

In addition, we found a significant association between KPV graph usage and the macro/microclassification across the set of six KPV graphs ($\chi^2=34.82$, $P_{.001}=20.52$, $df=5$). Five of the individual macro/microspecific KPV comparisons proved significant at the .01 level or above using the two-sample proportion t test (see Table 2, final column). Companies in microcountries used significantly more DPS, EPS, earnings, and ROCE graphs and significantly more companies in these countries graphed *at least one* KPV graph. On the other hand, significantly fewer companies in microcountries used cash flow graphs. These results are driven, in particular, by the exceedingly low level of usage of KPVs by German companies. Apart from cash flow, these results support Hypothesis 2b.

4.2. Topics graphed

In Table 3, we report the 26 topics totaling 10 or more graphs for any country.⁵ The topics are shown in descending order of total frequency across the six countries. The rank order of graph usage was France (551 graphs), Australia (447 graphs), the US (439 graphs), Germany (342 graphs), The Netherlands (326 graphs), and the UK (259 graphs). Thus, French companies use, on average, 11.0 graphs in each annual report, while UK companies use only 5.2 graphs in each report. When adjusted to include only those companies using graphs, this becomes 12.5 graphs for each French company and 6.3 graphs for each UK company. Thus, the total number of graphs shows distinctive national patterns.

The four most frequently graphed topics across the six countries are segmented sales, earnings, sales, and segmented earnings, demonstrating the importance of sales and earnings across our sample.⁶ French and Dutch companies include the greatest number of these four topics: 205.7 and 150.7 graphs, respectively. However, when expressed as a percentage of the total number of graphs used in individual countries, The Netherlands and the UK were the countries, which most favored these topics, constituting 46.2% and 40.2% of all graphs, respectively.⁷ Only Germany failed to include more than 10 earnings graphs, with only three earnings graphs (including segmented earnings) in total.

Two other topics constitute over 100 graphs across the six countries: capital expenditure and employees. France included the greatest number of capital expenditure graphs (28.3), with the US, the UK, and Germany all including approximately 19 graphs each. Interestingly (and perhaps defensively), given the UK's often lamented record on capital investment, the UK included the highest proportion of capital expenditure graphs. For employee graphs, France and Germany showed the highest absolute frequency, presenting 43.5 and 31.0 graphs, respectively. These two countries also showed the highest relative proportion of such graphs. There was a virtual absence of employee graphs from corporate annual reports in Australia, the UK, and the US.⁸

Reviewing the other topics graphed, distinctive national graphical reporting preferences become apparent. Australian companies were keen to report raw material prices (39 graphs) and raw material products (25 graphs), reflecting the extractive nature of much of their business. French companies were particularly forthcoming about stock market information (37.2 graphs related to share price, while 25.5 related to market indices)

⁵ Where a company presented two variables on the same graph (for example, EPS and DPS), this would count as 0.5 of a graph for both EPS and DPS.

⁶ We distinguish between *aggregate* sales and *aggregate* earnings (defined as KPVs) and *segmental* sales and *segmental* earnings. Where segmental information (for example, African sales) is further divided into individual countries (such as Botswana and Nigeria), we classify this as *secondary segmental* information.

⁷ Our sample sizes are constant. We, therefore, discuss both the absolute number of graphs of a particular topic in each country and their percentage of the overall total number. The absolute number of graphs indicates the overall importance of a topic to managers in a particular country. The percentages show the relative importance of each topic.

⁸ It should be recognized that our study is confined to corporate annual report and account documents and does not extend to special employee reports, which may be issued by companies.

Table 3
Analysis of all graphs by topic

Topic ^a	Australia		France		Germany		Netherlands		UK		US		Total		Country effect [Hypothesis 1c; χ^2_b (two-tailed)]	Macro/ microeffect [Hypothesis 2c; f^c (one-tailed)]
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Segmented sales	34.0	7.6	88.5	16.1	53.5	15.6	63.5	19.5	34.2	13.2	45.7	10.4	319.4	13.5	40.21***	-2.65**
Earnings	37.3	8.4	47.2	8.6	2.5	0.7	39.9	12.2	23.3	9.0	29.0	6.6	179.2	7.6	41.75***	2.89**
Sales	17.5	3.9	36.0	6.5	11.7	3.4	28.3	8.7	19.3	7.5	28.0	6.4	140.8	6.0	16.75**	0.99
Segmented earnings	22.0	4.9	34.0	6.2	0.5	0.2	19.0	5.8	27.2	10.5	30.3	6.9	133.0	5.6	32.09***	2.89**
Capital expenditure	8.5	1.9	28.3	5.1	18.8	5.5	14.2	4.3	19.0	7.4	20.2	4.6	109.0	4.6	11.91*	-1.20
Employee	8.0	1.8	43.5	7.9	31.0	9.1	14.8	4.6	5.0	1.9	2.0	0.5	104.3	4.4	77.76***	-7.25***
EPS	14.3	3.2	15.0	2.7	0.3	0.1	13.0	4.0	19.5	7.5	23.0	5.2	85.1	3.6	21.11***	3.83***
Share price	12.5	2.8	37.2	6.7	8.0	2.3	7.2	2.2	4.0	1.5	10.0	2.3	78.9	3.3	55.75***	-3.63***
Operating information	5.0	1.1	5.0	0.9	27.7	8.1	16.0	4.9	6.0	2.3	19.0	4.3	78.7	3.3	33.34***	-0.70
DPS	12.2	2.7	13.0	2.4	1.3	0.4	6.8	2.1	17.5	6.8	19.5	4.4	70.3	3.0	19.43**	3.05**
Cash flow	6.0	1.4	24.0	4.3	4.9	1.4	11.3	3.5	1.0	0.4	9.3	2.1	56.5	2.4	33.84***	-2.09*
Market indices	14.5	3.2	25.5	4.6	1.0	0.3	1.5	0.5	-	-	8.5	1.9	51.0	2.2	59.17***	-2.11*
Shareholder funds	8.3	1.9	17.0	3.1	3.0	0.9	10.3	3.2	4.5	1.7	6.0	1.4	49.1	2.1	15.57**	-0.43
Unit sales	12.0	2.7	2.0	0.4	9.0	2.6	5.0	1.5	-	-	21.0	4.8	49.0	2.1	36.10***	2.24*
Raw material prices	39.0	8.7	1.0	0.2	1.0	0.3	1.0	0.3	1.0	0.4	2.0	0.5	45.0	1.9	158.87***	4.66***
Balance sheet analysis	-	-	10.0	1.8	31.0	9.1	2.0	0.6	-	-	-	-	43.0	1.8	105.60***	-7.86***
Secondary segmental	-	-	11.0	2.0	8.0	2.3	7.0	2.1	14.0	5.4	3.0	0.7	43.0	1.8	18.26**	-0.87
ROCE	11.0	2.5	1.5	0.3	-	-	11.0	3.4	4.0	1.5	14.9	3.4	42.4	1.8	25.73***	4.63***

Raw material products	25.0	5.6	-	-	5.0	1.5	1.0	0.3	1.0	0.4	10.0	2.3	42.0	1.8	65.43***	3.49***
Financial gearing	13.0	2.9	6.0	1.1	-	-	8.0	2.4	5.0	1.9	9.0	2.0	41.0	1.7	13.88*	3.08**
Assets (various)	22.4	5.0	6.2	1.1	-	-	6.5	2.0	1.0	0.4	3.0	0.7	39.1	1.6	51.33***	2.83**
National economic statistics	15.0	3.4	-	-	11.0	3.2	1.0	0.3	-	-	1.0	0.2	28.0	1.2	46.57***	-0.16
Return on sales	0.5	0.1	10.5	1.9	1.0	0.3	4.0	1.2	-	-	9.3	2.1	25.3	1.1	25.49***	-0.80
Dividends (other than KPV)	10.5	2.3	6.4	1.2	0.9	0.3	1.2	0.4	-	-	4.8	1.1	23.8	1.0	20.93*** ^d	0.73
Source and application of funds analysis	1.0	0.2	1.0	0.2	13.0	3.8	-	-	-	-	-	-	15.0	0.6	53.40*** ^d	-4.45***
Other graphs	97.5	21.8	81.2	14.7	97.9	28.6	32.5	10.0	52.5	20.3	110.5	25.2	472.1	20.0	57.96***	-0.08
Total no. of graphs	447.0	100.0	551.0	100.0	342.0	100.0	326.0	100.0	259.0	100.0	439.0	100.0	2364.0	100.0	139.69***	
Mean number of graphs																
(a) Per company	8.9	11.0			6.8		6.5		5.2		8.8		7.9			
(b) Per graph using company	9.7	12.5			8.1		7.2		6.3		9.8		9.0			

^a The frequencies reported in this table are the number of times a variable is graphed and not the number of companies graphing a variable. The data in Tables 2 and 3 do not, therefore, necessarily reconcile.

^b Cramer's *V* ranged from 0.16 to 0.84 for the significant variables.

^c A negative sign indicates that the proportion of macrocountries graphing these topics was greater than the comparable proportion of microcountries and vice versa.

^d The validity of this result is eroded as the expected values for the cells were 2.50 (Lawal, 1980; Silver, 1992).

* Significant at .05 level.

** Significant at .01 level.

*** Significant at .001 level.

and cash flow (24 graphs). In Germany, companies frequently provided operating information (27.7 graphs) and balance sheet analysis (31 graphs).⁹ Dutch companies, in addition to providing operating information (16 graphs), also focused on cash flow (11.3 graphs). In the UK, performance measures were more in evidence, with 19.5 EPS graphs and 17.5 DPS graphs. Finally, in the US, EPS (23 graphs), unit sales (21 graphs), and DPS (19.5) graphs were particularly important. However, in the case of EPS graphs, although the US is the greatest user in absolute terms, UK managers consider them to be relatively more important (7.5% vs. 5.2%).

The data in Table 3 are used to test 1c, 2c, 2ci, and 2cii. Hypothesis 1c was significant across the set of 26 topics ($\chi^2=990.05$, $P_{.001}=149.4$ when $df > 100$). Moreover, significant results were obtained (at the .05 level or greater) for each of the 26 individual topics and for the total number of graphs (see Table 3, second last column). Raw material prices ($\chi^2=158.87$), total number of graphs ($\chi^2=139.69$), balance sheet analyses ($\chi^2=105.60$), and employees ($\chi^2=77.76$) were most significant. The results for raw material prices appeared to be driven by Australia, those for balance sheet analysis by Germany and those for employees by France and Germany. Overall, when comparing the observed individual cell frequencies with the expected values (not reported here), in the contingency tables for the 26 variables tested, France (9 out of 26 topics) and Germany (7 out of 26 topics) were the countries, which had the greatest deviations from the expected the most number of times. These two macrocountries' patterns of reporting were, therefore, distinctively different from those in microcountries. By contrast, The Netherlands (8 out of 26 topics) and the US (5 out of 26 topics) deviated the least from the expected cell frequencies the most often. Hypothesis 1c is supported.

For the set of 26 topics, there was an association between the macro/microclassification and the particular topics graphed ($\chi^2=278.24$, $P_{.001}=52.62$, $df=25$). Moreover, 17 out of 26 individual paired macro/microcomparisons were significant at the .05 level or greater (using the two-sample *t* test; see Table 3, final column). In particular, eight comparisons were significant at the .001 level: in four cases, the microproportion was greater than the macroproportion (EPS, raw material products, raw material prices, and ROCE), and in another four cases, the macroproportion was greater than the microproportion (employees, share price, balance sheet analysis, and source and application of funds). Hypothesis 2c is broadly supported. Further examination of the individual cell frequencies (not reported here) in the contingency tables shows that, across the 26 topics, these results are driven especially by German graphical practices. For three out of the eight results significant at the .001 level (balance sheet analysis, source and application of funds statement, and EPS), Germany's observed results deviated the most (out of the six countries) from the expected results. For the first two variables, the number of German graphs was significantly *more* than expected, while Germany graphed significantly less EPS variables than expected. German results were, therefore, the most distinctively different of the six countries.

⁹ A 'balance sheet analysis' graph is a graph that subdivides the company's capital employed into the principal asset categories.

The more specific hypotheses (Hypotheses 2ci and 2cii) were partially supported. Only 12 of the 23 individual *financial* variables were used proportionately more (10 at the .05 significance level or greater) by microcountries rather than macrocountries (as expected) and the two *nonfinancial* variables (employees and national economic statistics) were used more (employees at the .001 significance level) by macro- than microcountries (as expected). In addition, an overall association between macro/microclassification and use of the set of financial/nonfinancial variables was confirmed, supporting Hypotheses 2ci and 2cii ($\chi^2=43.75$, $P_{.001}=10.83$, $df=1$).

4.3. Location of KPVs

From this point on, our analysis focuses exclusively on the KPV graphs. Table 4 reports the prominence given to these graphs within the annual report. We term the KPV graphs, together with those graphs grouped and displayed with them, as ‘highlighted’ graphs. Based on a review of the structure typically found in annual reports and the typical locations of the financial graphs, we allocated these highlighted graphs into three principal categories: front (first five pages of report), middle, and back (last five pages of report). The first five pages of annual reports typically include the financial highlights section, the President’s letter, and the operations review. Subsequent sections include the Management Discussion and Analysis (MDA) and the financial statements. Following this, there are typically few pages (average 5), which might contain stockholder information and an historical summary, in varying order. Most often, graphs of the KPVs tend to be included, as a group, within the highlights section or the historical summary.¹⁰ In some cases, a company’s KPV graphs were located in more than one category (e.g., front and middle). Across the six countries, 40% of highlighted graphs were grouped prominently at the front of the report. There was, however, substantial variation: the majority of UK and Australian companies placed these graphs at the front of the report, whereas the majority of German and Dutch companies placed them in the middle. US companies’ highlighted graphs were found mostly in either the front or middle of the report. Finally, French companies’ highlighted graphs were dispersed widely throughout the report. French graphs (as Fig. 2 shows) occupied three times as many pages as Australian, UK, and French KPV graphs.

Table 4 provides the data to test Hypotheses 1d and 2d. The table rows were collapsed (due to the number of empty cells) for the χ^2 testing into two categories: (1) those graphs located in the ‘front’ and ‘front and middle’ (first two rows of Table 4) and (2) those graphs located in the ‘middle,’ ‘middle and back,’ ‘back,’ or ‘front and back’ (next four rows of Table 4). When Hypothesis 1d was tested, the overall χ^2 was 53.84 (significant at the .001 level, $P_{.001}=20.52$, $df=5$). An association was, therefore, found between country

¹⁰ Behaviorally, many users tend to read annual reports very briefly. Indeed, Squiers (1989) reports that 40% read them for only a few minutes. In such circumstances, we reason that only material at the front (or perhaps the back) will be noticed. It is known that many people, somewhat perversely, read magazine-style the documents, from the back to the front! In this context, the magazine-type qualities of the modern annual report are documented by Graves, Flesher, and Jordan (1996).

Table 4
Location of KPV graphs by number of companies

Location	Australia		France		Germany		Netherlands		UK		US		Total		Country effect [Hypothesis 1d; χ^2_{2a} (two-tailed)]	Macro/micro effect [Hypothesis 2d; F^b (one-tailed)]	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Front	23	61	18	45	2	14	3	7.5	18	14	72	14	35	78	40	26.37***	0.49
Front and middle	3	8	6	15	–	–	–	–	1	4	4	12	31	22	11		0.03
Middle	10	26	2	5	12	86	37	92.5	3	12	11	28	75	38	27.47***	2.19*	
Middle and back	–	–	10	25	–	–	–	–	–	–	–	1	3	11	6		–4.84***
Back	2	5	2	5	–	–	–	–	2	8	–	–	–	6	3		–0.32
Front and back	–	–	2	5	–	–	–	–	1	4	1	3	4	2			–1.02
Total	38	100	40	100	14	100	40	100.0	25	100	39	100	196	100			
Mean number of pages occupied	0.54		1.72		1.0		0.91		0.65		0.58		0.9				

^a Cramer's V varied from 0.51 to 0.53 for significant variables.

^b A negative sign indicates that the proportion of companies in macrocountries locating their graphs in this section of the annual report was greater than the comparable proportion of companies in microcountries and vice versa.

* Significant at .05 level.

*** Significant at .001 level.

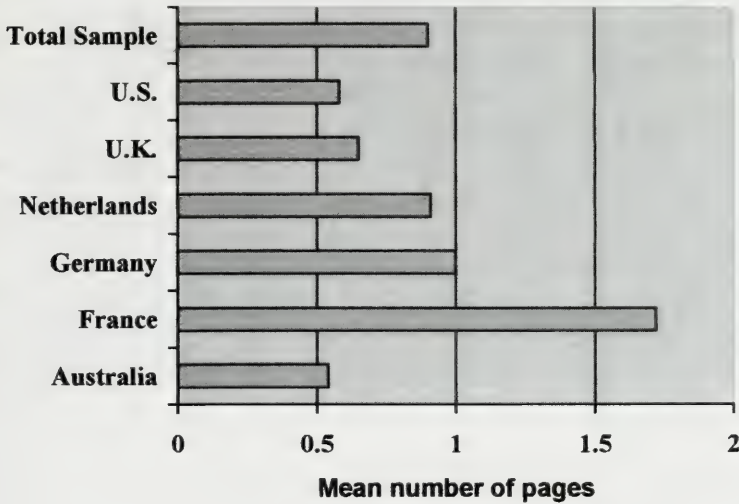


Fig. 2. Mean number of pages occupied by KPV graphs.

and location of the graphs, supporting Hypothesis 1d. When the individual cells of the contingency table (not reported here) were examined, The Netherlands was found to be the country, which was driving the overall χ^2 statistic (contributing 30.32 to the overall χ^2 of 53.84). In particular, The Netherlands had a very small number of graphs at the front of the annual report (7.5%).

The relationship between graph location and the macro/microclassification was tested on the set of location categories and on the individual categories. The overall association across the set of six location categories was nonsignificant ($\chi^2=0.25$, $P_{.05}=3.84$, $df=1$). Furthermore, only one of the six individual t tests was significant at the .001 level (middle and back category). This result was driven by the large number of French graphs (25%), which fell into this category. Although this one individual result was in line with our hypothesis, mainly we found Hypothesis 2d to be unsupported (i.e., graphs in microcountries were not generally presented more prominently than those in macrocountries).

4.4. Time series graphed

We report the number of years graphed for the KPVs in Table 5 and Fig. 3. Across the six countries, 5 years was the most popular (59.1%), followed by 10 years (12.2%) and then by 3 years (8.5%). Five-year trends were particularly popular for Dutch (75%) and Australian (71%) KPV graphs. Short time trends of 5 years or less were used for the KPV graphs of 81% of Dutch companies, for 82% of Australian companies, for 83% of German companies, and for 87% of French companies. By comparison, a sizeable minority of UK and US companies graphed time series of longer than 5 years. In particular, 19% of UK and 26% of US KPV graphs were for 10 years.

Table 5
Length of time series graphed — KPVP graphs

Years	Australia		France		Germany		Netherlands		UK		US		Total		Country effect [Hypothesis 1e; χ^2_{α} (two-tailed)]	Macro/microeffect [Hypothesis 2e; t^b (one-tailed)]
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
2	—	—	3.5	2	—	—	1.0	1	5.0	6	—	—	9.5	1.8	21.33***	-0.57
3	9.0	11	17.8	13	1.0	9	—	—	3.7	5	12.0	10	43.5	8.5	—	-2.25*
4	—	—	16.7	12	1.0	9	4.8	5	3.0	4	1.0	1	26.5	5.2	—	-4.46***
5	57.5	71	81.2	60	7.7	65	69.4	75	41.0	51	47.5	41	304.3	59.1	12.64*	-0.41
6	4.5	6	—	—	—	—	7.3	8	3.0	4	8.0	7	22.8	4.4	36.71***	3.09**
7	3.5	4	7.5	6	—	—	—	—	—	—	3.0	3	14.0	2.7	—	-2.10*
8	—	—	1.0	1	—	—	—	—	—	—	—	—	1.0	0.2	—	-1.58
9	4.0	5	2.5	2	—	—	—	—	5.0	6	—	—	11.5	2.2	—	0.51
10	2.8	3	4.0	3	2.0	17	9.0	10	15.0	19	29.8	26	62.6	12.2	—	3.54***
11	—	—	1.0	1	—	—	1.0	1	3.0	4	9.5	8	14.5	2.8	—	1.85*
12	—	—	—	—	—	—	—	—	—	—	3.0	3	3.0	0.6	—	1.35 ^c
20	—	—	—	—	—	—	—	—	—	—	0.5	1	0.5	0.1	—	—
22	—	—	—	—	—	—	—	—	1.0	1	—	—	1.0	0.2	—	—
Total	81.3	100	135.2	100	11.7	100	92.5	100	79.7	100	114.3	100	514.7	100.0	—	—

^a Cramer's V varied from 0.11 to 0.26 for significant variables.

^b A negative sign indicates that the proportion of KPVP graphs in macrocountries graphing this length of time series was greater than the comparable proportion of KPVP graphs in microcountries and vice versa.

^c Represents over 12 category.

* Significant at .05 level.

** Significant at .01 level.

*** Significant at .001 level.

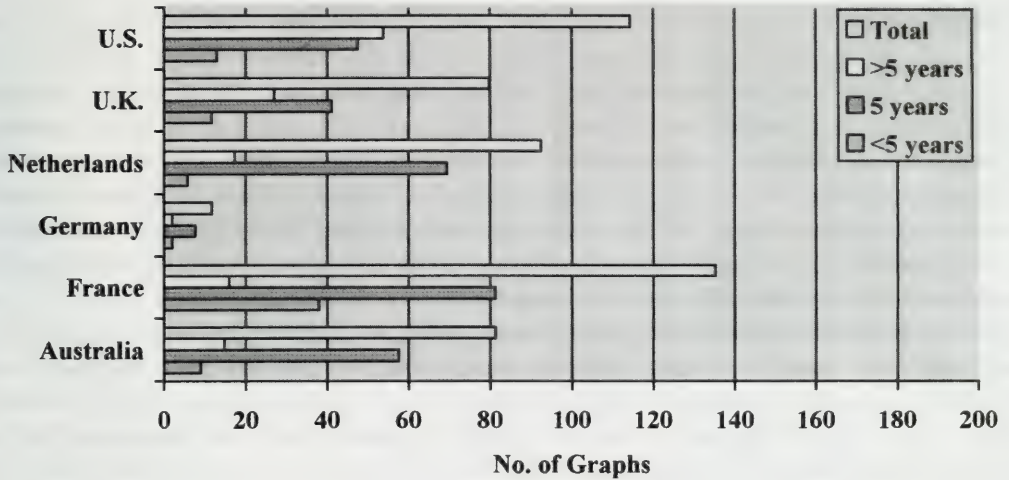


Fig. 3. Length of time series graphed in KPV graphs by 50 large listed companies.

Table 5 provides data, which allow testing of Hypotheses 1e and 2e. The table rows were collapsed due to the number of empty cells into a 3×6 (less than 5 years, 5 years, and more than 5 years \times six countries) contingency table for the χ^2 testing. When Hypothesis 1e was tested, the overall χ^2 was 70.67 ($P_{.001} = 29.59$, $df = 10$). The three individual χ^2 statistics on the collapsed table were also significant (see Table 5, second last column). In particular, both the less than five and greater than five categories were significant at the .001 level. An association therefore exists between country and length of time series graphed. Hypothesis 1e is supported.

The effect of the macro/microclassification was tested using χ^2 on the set of time series length categories and the two-sample proportion t test on individual categories. The overall χ^2 across the set of three collapsed time series length categories was 32.62 ($P_{.001} = 13.82$, $df = 2$). Turning to individual years, 4 ($t = -4.46$) and 10 years ($t = 3.54$) were significant at the .001 level. With three collapsed categories (t results not shown in table), both the less than 5 years ($t = -4.68$) and greater than 5 years ($t = 4.34$) categories were associated with the macro/microclassification. In particular, macrocountries are significantly more likely to graph shorter time trends than microcountries, while microcountries are significantly more likely to graph longer time series than macrocountries. This was counter to Hypothesis 2e. An examination of the individual cells of the contingency table shows this result to be driven by France and the US.¹¹ Hypothesis 2e is not supported.

¹¹ French companies deviated most from the expected cell frequencies (contributing 14.0 to the overall χ^2 of 21.3) for the less than 5-year category. However, US companies deviated most from both the 5 year (contributing 6.0 to the overall χ^2 of 12.6) and greater than 5 year categories (contributing 21.0 to the overall χ^2 of 36.7).

5. Discussion

Results show that the extent of intercountry variation in reporting practices was itself variable across the graphical issues examined. There was little variation in the proportion of companies using graphs. By contrast, there was considerable variation in (1) the proportion of companies graphing KPVs, (2) the topics graphed, (3) the locational prominence of KPV graphs, and (4) the length of time series graphed. Certain distinctive national reporting patterns emerge, and we highlight in this discussion the key features of each country in turn, considering first the group of macrocountries (France and Germany).

French companies used the greatest number of graphs (551 graphs, 11.0 graphs per company) with over two-thirds graphing sales and earnings. French companies also produced (in both absolute and relative terms) the greatest number of stock market information, cash flow, and employee graphs. Although we had expected the high frequency of employee graphs, the incidence of the other performance-orientated graphs in a macrooriented country was unexpected. Perhaps, French companies are more equity shareholder-oriented than is normally appreciated. Results for Germany, by contrast, were more in line with our expectations. Sales was the only performance variable graphed by more than 25% of German companies. The other topics graphed by German companies differed markedly from the other countries studied, with little emphasis being placed on earnings, DPS, or EPS but more attention being paid to employee information, operating information, and the balance sheet. The majority of German KPV graphs was located in the middle of the annual report. France and Germany, surprisingly, were most likely to present short time series of 5 years or less.

Turning now to the four microcountries (Australia, The Netherlands, the UK, and the US), Australian companies (92%) were found to be the most likely to use graphs and were the only companies to graph, in any great numbers, raw material product and price information. This reflects the mining and extractive nature of many of the Australian companies sampled. KPV graphs were generally presented prominently at the front of the annual report. The Netherlands (along with France) was the only country where cash flow was graphed by more than 25% of companies. In addition, The Netherlands (along with Germany) was the only country where DPS failed to count as a KPV. Dutch companies focused on segmental sales graphs, with Dutch KPV graphs being typically found in the middle of the report. Perhaps surprisingly, UK companies were the least likely to use graphs (259 graphs in total, 5.2 per company). They were, however, the most likely to place them at the front of the annual report (72%). Together with US companies, UK companies graphed the longest time trends. Finally, the US was the only country (apart from France) where we found five KPVs. Particularly interesting was the graphing of return on average capital employed by 17 US companies. US companies also graphed the longest time trends, with 38% of US KPVs being graphed for 10 or more years.

Our results broadly confirm the pattern of usage demonstrated by the prior financial graphs literature by showing that many companies use graphs and present them in material numbers. Indeed, for all countries, we found graph usage above 80%. This is in

line with the frequencies presented in Table 1. Mean graph usage ranged from 5.2 (UK) to 11.0 (France). This confirms the rather parsimonious use of graphs by UK companies found by Beattie and Jones (1992a,b). Overall, this result is also in line with the prior literature for Australia, the UK, and the US, except for Beattie and Jones (1997). Finally, we also find, as did the prior literature, earnings, sales, and EPS to be important graphed variables.

Hypotheses 1a, 1b, 1c, 1d, and 1e concerned the existence of intercountry variation in graphical reporting practices. We found mixed support for Hypothesis 1a that the use of graphs was associated with different countries (supported for Hypothesis 1a_{ii}: *at least one* KPV; not supported for Hypothesis 1a_i: *any* financial or nonfinancial variable). Statistical testing, mainly, supported Hypotheses 1b, 1c, 1d, 1e, and i.e., there were significant intercountry differences in the use of individual KPV graphs, the individual topics graphed, graph location, and the length of the time series graphed.

Hypotheses 2a, 2b, 2c, 2d, and 2e concerned the existence of differences between the graphical reporting practices of macro- and microcountries. These hypotheses were, in general, only partially supported. There was mixed support for Hypothesis 2a that suggests that the annual reports of microbased companies would contain more graphs than the annual reports of macrobased companies. This hypothesis was supported in respect of *at least one* KPV but not supported in respect of *any* financial or nonfinancial variable. We found distinctive predictable differences between macro- and microcountries with respect to the use of individual KPV graphs (Hypothesis 2b). In particular, as expected, companies in microcountries were more likely than companies in macrocountries to use specific KPV graphs. This is consistent with the proposition expressed by disclosure researchers that, on average, microbased countries disclose more than macrobased countries. However, within the macrogroup, we found clear differences between Germany and France. Germany, as expected, was a very low user of KPV graphs. However, France was a surprisingly high user in line with levels found in microcountries. In the case of France, the use of graphs appears to diverge from disclosure practices.

We also found differences between macro- and microcountries with respect to the topics graphed (Hypothesis 2c; significant for 17 out of 26 topics). In 12 out of 23 cases, financial variables were graphed more by microcompanies than by macrocompanies (as expected, but a marginal result). However, 10 out of the 12 results were significant (Hypothesis 2c_i). Of the 11 results that were counter to expectations, five were insignificant. However, six variables were graphed significantly more by macrocompanies (segmented sales, share price, market indices, cash flow, balance sheet analysis, and source and application of funds analysis).¹² For the first four significant variables, the result is driven by France, whereas Germany drives the last two. We speculate that the focus on sales, cash flow, balance sheets, and source and applications may reinforce the view that macrocountries are

¹² Cash flow statements and sources and application of funds statements are broadly similar yet differ in certain key respects. While both present changes in liquidity, the sources and applications of funds statements focus on changes in balance sheet structure, whereas cash flow statements focus more directly on cash flow. We have, therefore, treated them as distinct variables in this study.

relatively more interested in growth and stability than in earnings performance. By contrast, the focus by French companies, in particular on graphs of share price and market indices is much more surprising. Macrocountries were not predicted to be so capital market driven. Further research is needed to establish why France is so capital market-driven. Hypothesis 2cii was also supported. In particular, French and German companies were significantly more likely to include employee graphs in their annual reports than were companies in the microcountries. We found no support for Hypothesis 2d of an association between macro/microclassification and graph location. For Hypothesis 2e, we did find distinctive differences between the length of time series graphed in macro- and microcountries. In particular, macrocountries graphed shorter time trends than microcountries (contrary to expectations). This counter-intuitive finding may indicate that the microbased countries are seeking to provide their users with more meaningful performance-based data and/or may reflect the relatively less sophisticated and established nature of corporate reporting in France and Germany. In these two countries, consolidated accounts are comparatively new, and thus, the historical records for past time series may just not be available.¹³

It is interesting to speculate on why Germany, but not France, appears to have a distinctly different pattern of graphical reporting to the microcountries. Germany does emerge as a reporting outlier within our six countries. This result is not predicted by the prior literature (Doupnik & Salter, 1993, 1995; Gray, 1988; Nair & Frank, 1980; Nobes, 1983). Prior research broadly indicates that France and Germany are macrocountries at the class level. Although, there is some evidence that they may be different when countries are analyzed into more refined subgroups (Doupnik & Salter, 1993, p. 53). However, in general, the prior literature provides little indication that Germany, rather than for example France, is a reporting outlier.

We speculate that this difference between France and Germany may lie in recent developments in international business. Both France and Germany are increasingly seeking international listings and adopting Anglo Saxon accounting practices. Consolidated accounts in both countries can now be drawn up in accordance with international principles. However, this trend towards the adoption of international accounting principles is more evident in France than in Germany. In January 1998, 32 French companies, but only 10 German companies, referred to International Accounting Standards in their accounts (Roberts, Weetman, & Gordon, 1998). Meanwhile, 15 French companies, but only 9 German companies, were listed on the New York Stock Exchange in February 1999 (New York Stock Exchange, 1999).

Our study may reflect these wider trends in financial reporting. It is possible that the presentation of financial graphs, being voluntary, magnifies underlying trends in reporting. Financial graphs may be used as a signal by management to external investors. The greater use of KPV graphs and other financial performance graphs by French companies in 1992 may signal their greater willingness to adopt Anglo-American accounting. By contrast, it may also signal German reticence to adopt international principles.

¹³ We are grateful to Professor Stuart McLeay for this point.

6. Conclusions

This study has examined an aspect of voluntary corporate reporting practices not previously explored from a transnational perspective. The graphical reporting practices of 50 companies in each of six important countries worldwide (Australia, France, Germany, The Netherlands, the UK, and the US) are documented. Five issues are analyzed: existence of graphs, existence of KPV graphs, topics graphed, prominence of presentation, and length of time series graphed. There is little variation in the percentage of companies using graphs. Six KPVs, graphed by over 25% of companies in any country, are identified: sales, earnings, DPS, EPS, ROCE, and cash flow. Particular intercountry differences in terms of KPVs are that only French and Dutch companies graph cash flow, only US companies graph ROCE, while German companies graph *only* sales. Although companies in all countries, except Germany, graph an earnings variable, the exact definition of earnings varies from country to country. For example, UK companies graph profit before taxation while US companies graph net income (i.e., profit after tax). Statistically significant intercountry differences in practice were found in terms of KPVs graphed, topics graphed, location of KPVs, and length of time series graphed. German companies' graphical practices appeared to be most at variance with those of the other countries. Some evidence was discovered that graphical practices in the microbased countries (Australia, the Netherlands, the UK, and the US) were significantly different from those in the macrobased countries (France and Germany). However, these results were driven more by Germany than France. This casts some doubt on the ability of this simple dichotomous classification to explain fully companies' voluntary reporting practices.

The results of this study broadly confirm that the microreporting group is more homogeneous than the macrogroup (as demonstrated by Douppnik & Salter, 1993, 1995). In particular, France and Germany's graphical reporting practices are extremely different, especially in terms of KPVs. Whereas German companies are parsimonious users of graphs, French companies are keen users. On a country level, this research, therefore, indicates that French accounting practices may not be as distinctive from microbased countries' practices as prior literature suggests. Of our results, Germany emerged as a graphical reporting outlier. These differences between France and Germany within the macrogrouping are consistent with the nine-cluster solution of Douppnik and Salter (1993, 1995).

To date, research into international accounting practices has focused on measurement and disclosure issues. In fact, graphs are an indirect product of these practices and form part of the financial reporting process generally. Our findings provide preliminary evidence that graphical reporting practices are not well explained by the broad macro/microclassification. Further research is, therefore, required to identify and investigate the factors that drive the range of graphical reporting practices.

Our research also has wider implications for future work into country studies and for international voluntary reporting practices. First, more work is necessary on the nature of the relationship between the three different aspects of reporting practices (i.e., measurement, disclosure, and presentation) and between mandatory and voluntary disclosure. For example, do conservative measurement and/or disclosure practices carry over to presentational

reporting practices? Second, further research would be useful, on a bilateral basis, to establish the similarities and differences between the accounting practices of France and Germany. This would establish whether it is justifiable to class them together as macrocountries or as a Continental European group. Third, it would be useful to review accounting practices in both France and Germany in the light of recent developments concerning the International Accounting Standards Board. Given that France and Germany are both macrocountries, the potential adoption of a core set of accounting standards based essentially on microaccounting philosophy may cause particular difficulties for these countries.

Acknowledgments

We are grateful to the Institute of Chartered Accountants in England and Wales for funding this research and to Terry Cooke for his helpful suggestions on an earlier draft. Mike Bailey's help in coding the data was much appreciated. The advice of David Butler, Peter Morgan, and Mick Silver has also improved this paper. Previous versions of this paper were presented at the 1995 British Accounting Association Conference at Bristol and the 1997 Gregynog Colloquium. The statistical testing reported in this paper is based, in part, upon descriptive data presented in the authors' much more general research study (*Financial Graphs in Corporate Annual Reports: A Review of Practice in Six Countries*, ICAEW, London, 1996).

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Pergamon

The International Journal of Accounting
36 (2001) 223–249

The
International
Journal of
Accounting

The intellectual structure of international accounting in the early 1990s

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Abstract

This paper derives an intellectual structure of the international accounting literature using co-citation analysis. The structure is found to be fragmented, with a number of areas needing further research to integrate them. The paper identifies the 10 most frequently cited documents. These are predominantly books and standards. It appears that books written by key researchers provide a foundation for the development of related research. The paper also identifies a core literature in international accounting, which focuses on the areas of comparative systems, classification studies, foreign currency, and inflation. By examining the structure and nature of international accounting research in the early 1990s, this study provides insights into the antecedents to contemporary international research. This is useful in assessing how this area of research has developed since then as it creates a benchmark for comparison. The study also contributes to defining the boundaries of the area. Finally, the paper provides a measure of the degree of fragmentation of the international accounting literature and identifies areas that may be integrated through further research. © 2001 University of Illinois. All rights reserved.

Keywords: Intellectual structure; Fragmentation; International accounting literature; Citation analysis; International accounting research

1. Introduction

An overall view of the intellectual structure of a field is useful for researchers, teachers, and students (Borokhovich, Bricker, & Simkins, 1994). It provides a means for researchers to “locate” their research within the field and identify potential new directions. Teachers may use the intellectual structure to inform the way they address the international accounting literature

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and to check that key literature is covered. Students benefit from the broad view of the literature as a starting point for more detailed study. In the case of international accounting, these benefits are particularly important given the eclectic nature of the area and the lack of a clear definition or guiding methodology (American Accounting Association, 1993; Locke, 1992).

International accounting has emerged as a specialty area for teaching and research (Bindon & Gernon, 1987; Evans, Taylor, & Holzmann, 1985; Samuels & Piper, 1985; Wallace, 1987), although there is still uncertainty about its boundaries and what role it should have in the accounting curriculum (e.g., Agami, 1991; Cohen, Pant, & Sharp, 1991; Fleming, Shooshtari, & Wallwork, 1993; Gray & Roberts, 1984; McClure, 1988; Mintz, 1980; Mueller & Zimmerman, 1968; Seidler, 1967; Sherman, 1987; Stout & Schweikart, 1989; Stout, Wygal, & Volpi, 1988). As an area emerges and develops, it is important that researchers and teachers have an overview of the specialty and its direction. These understandings are fostered by traditional review articles and bibliographies of international accounting that have provided classifications and descriptions of international accounting research (Agami & Kollaritsch, 1983; American Accounting Association, 1993; Berry, 1990; Bindon & Gernon, 1987; Gernon & Wallace, 1995; Kubin & Mueller, 1973; Needles, 1997; Prather & Rueschhoff, 1996; Prather-Kinsey & Rueschhoff, 1999; Wallace, 1987).

The purpose of this study is to derive empirically an intellectual structure for international accounting for the period 1977–1993 using co-citation analysis. An understanding of the antecedent literature informs research directions today and may be a basis for understanding developments since the 1990s. Co-citation analysis is a technique that uses citations to map communication networks providing information about the patterns of communication among researchers and the level of integration of the literature (that is, the effectiveness of the communication).

A view of the intellectual structure of a disciplinary area using co-citation analysis provides additional perspectives to traditional reviews because: (1) it allows a large portion of the researchers active in the area to “unselfconsciously” provide the data for the analysis, (2) it does not depend on the reviewers’ knowledge of the literature, and (3) it allows a more extensive overview of the literature than is possible otherwise (Bricker, 1987, 1989).

This paper is structured as follows. Section 2 briefly describes the co-citation technique. Section 3 describes the data and includes a description of the most highly cited documents. The nature of fragmentation and its impact on the development of literature in a specialty is described and evidence about fragmentation in international accounting is provided in Section 4. Section 5 describes the intellectual structure of international accounting based on the co-citation analysis. Section 6 provides a summary and conclusions regarding areas of fragmentation in international accounting, international accounting curriculum design, and the state of development of the literature.

2. Co-citation analysis

The specific co-citation technique used in this paper was developed by Bricker (1987) to derive an intellectual structure for the accounting discipline and to identify the level of

fragmentation present. Similar techniques have also been used in accounting by Gamble, O'Doherty, and Hyman (1987) and McRae (1974), and extensively in other fields (e.g., Bayer, Smart, & McLaughlin, 1990; Braam, Moed, & van Raan, 1988, 1991; Crawford & Crawford, 1980; McCain, 1983, 1991; Small, 1977; White & Griffith, 1981). In conjunction with other citation measures, it is able to provide a representation of the way ideas have been interrelated in a research area, the pattern of development of ideas in the field and identify the core literature. Co-citation analysis provides only one view, but it is a view derived from the interconnections between ideas as represented by citations by a large section of publishing researchers in the area and as such avoids the limitations of individual reviews.

Co-citation analysis was originally developed by Small and Griffith (1974) to investigate two central hypotheses: first, that “science is made up of a structure of specialties that can be defined by objective means” and second that a “particular citation measure of the common intellectual interest between two documents was a practical way of defining the structure” (Garfield, 1979, p. 99). Co-citation analysis has subsequently been refined and widely used (Bricker, 1989, p. 250; Garfield, 1979, p. 135).

The first step in the analysis is to identify a sample of source documents. These should be drawn from the field of interest, in this case international accounting. Each source document will include citations to previous work that the author perceived as linked to his or her research. By identifying two or more previous works as related to their current research, the author also identifies a link between those previous works by citing them together. Co-citation analysis focuses on the links created between the cited works as a result of their being co-cited by a source author.

Once the sample of source documents has been selected, every work cited in a source document is paired¹ to form co-citation pairs. The co-citation procedure seeks to identify unique pairs of documents. For this reason, it is the combinations of pairs and not the permutations that are of interest.

The pairing process is repeated for all source documents and then the frequency of occurrence of each unique pair is computed. The more times a co-citation pair occurs (i.e., the greater the number of source documents that cite both the documents together) the stronger the link between the pair of papers. This frequency of co-citation, called co-citation strength, shows how many times the ideas contained in the two previously published documents were linked in later documents, and thus reflects the degree of consensus within an area about the link between the two documents in a co-cited pair. Braam, Moed, and van Raan (1991, p. 248) explain that while it may be shown that “source publications do share a focus on the *most recent* earlier literature, but consensus about *what* most recent earlier literature is important (and should be ‘cited’) only exists among the publications citing co-citation clusters.” The higher the co-citation strength of a pair of documents, the greater the consensus among citing authors that the documents should be cited and that there is an intellectual link between them.

One approach to mapping patterns of linked ideas is to use co-citation pairs to seed co-citation clusters of a given minimum co-citation strength. The clustering sequentially links all

¹ The “co” in co-citation analysis refers to this pairing. Tri-citation analysis has been considered and ruled out because the number of repeated citations of triples of papers is very low (Small, 1980).

pairs of documents that have one paper in common. Once all the documents that have any link with the original pair have been included in the cluster, the cluster is complete. Thus, each cluster will include documents that are linked, either directly or indirectly, with documents already included in the cluster. When the first cluster is complete, a pair from any of the remaining pairs is used to seed the next cluster and so on until all the pairs are clustered or shown to be isolated as clusters of only one pair.

The extension of the method to include sequential co-citation threshold stepping is a useful advance in the method's application (Bricker, 1987). This method applies citation threshold levels (CTLs) stepping through from a minimum to a maximum and plotting the resultant clusters on a dendrogram. Thus, if the threshold is three, each co-cited pair to be included for clustering must have been cited together at least three times. As the threshold is raised, fewer documents of more general application are included. The highly co-cited documents included at high CTLs are naturally also included at lower CTLs, so in general, any document included in a level higher than the current CTL must also be included in the current CTL.

A dendrogram is a way of representing this nesting of the clusters across threshold levels. As more pairs are included in the clusters, some clusters are likely to merge as additional pairs create links to bring the clusters together. It is this relationship between the clusters that is reflected in the dendrogram. Each branch represents a cluster and they are shown to merge in the nesting structure as the lines meet in the dendrogram.

Stepping through the threshold levels thus provides a nested structure of the research area (Bricker, 1989, p. 250; Garfield, 1979, p. 102). The benefit of sequential co-citation threshold stepping is that it allows the focus of the structure to be expressed from very narrow on the right hand side of a dendrogram to very broad on the left. That is, it reveals the levels of nesting within clusters.

The combined characteristics of capturing the intellectual exchange of ideas through citations, the dynamic nature of the co-citation analysis, and the ability to describe the structure of the research area make co-citation analysis an appropriate technique to provide a description of the subject matter of international accounting.

2.1. Strengths and limitations of co-citation analysis

The main strength of co-citation analysis is its objectivity and the availability of the data. An alternative technique for identifying the structure of a discipline is to survey researchers in the area about relationships among topical areas. In a discipline with an extensive range of literature, it may be very difficult for researchers to formulate a "big picture" view of the structure, and when asked to do so, they may necessarily weight their response towards the areas in which they are involved — not necessarily because of a deliberate bias, but because of their greater familiarity with that area. It is also difficult to "average" responses to survey questions on patterns of relationships in a field. Co-citation analysis uses data produced unselfconsciously by researchers and provides a means of transforming such data into a map of the discipline or specialty.

Studies that have sought to verify a co-citation structure by comparing it to one produced by experts in the field have in the majority of cases, found that the experts concur with the

relationships identified by the technique (Braam et al., 1991, p. 241; Garfield, 1979, pp. 72–73; McCain, 1986; Small, 1977; White & Griffith, 1981). In the case of accounting, Bricker (1987) validates the results of the co-citation analysis by using multiple discriminant analysis on the articles classified in Brown and Vasarhelyi's (1985) *Accounting Research Directory*. The test is designed to confirm that the multiple discriminant analysis technique classifies the articles into the same groups as the co-citation cluster analysis (Bricker, 1987, p. 100). This validation technique confirms the representational structure generated by the co-citation analysis (pp. 143–148).

Co-citation analysis also has certain limitations. There is the assumption that a citation by the source author of a previous study represents an intellectual connection. That is, the author has read the earlier work and has concluded that it is relevant to the point he or she is currently making. When a source author cites two earlier works co-citation analysis is premised on the idea that the source author identified and has created an intellectual link between those two papers.

Other features of citing behaviour have been raised as impacting on citation studies (Baird & Oppenheim, 1994; Liu, 1993). The tendency to over-cite in order to “demonstrate” a knowledge of the literature (Baird & Oppenheim, 1994; Moravcsik & Murugesan, 1975; Subotnik, 1991) and the potential to inflate the importance of the author's own work by extensive self-citation (Baird & Oppenheim, 1994; Liu, 1993; Moravcsik & Murugesan, 1975) are two commonly discussed problems. Another concern is the appropriate treatment of a negative citation, that is, a reference to an early work that disagrees with its methods or findings (Downing & Stafford, 1981). Under-citing may also be a problem, but since researchers are sensitive to the unacknowledged use of their work this practice has a social pressure to reduce its occurrence. One type of under-citing is through the phenomenon of obliteration by incorporation (Garfield, 1979, 1980; Merton, 1965). This occurs as a theory or finding becomes so well known that it is no longer referenced to its original publication. While it may represent the ultimate compliment for a researcher's work to attain such a status, it also means that the use of citation techniques will not reflect the continuing use of the idea.

3. Data

The relevant data for this study are the citations from published work in the international accounting area. Journal articles are the most commonly used source of citations in citation studies. The citations are obtained either directly from the journals or indirectly through indexing services such as the Social Sciences Citation Index (SSCI). In the case of international accounting, the SSCI does not cover journals that regularly publish international articles (American Accounting Association, 1993; Social Sciences Citation Index Guide and Journal Lists, 1993). The use of an existing database also means that the difficulties associated with errors in mass data input are unavoidable (Beattie & Ryan, 1989; Brown & Gardner, 1985). For this study, the source articles in the *International Journal of Accounting* (IJA) were used to create the database of citations manually. The IJA was selected as a well-respected journal in the international accounting field. It was cited most frequently (146 times) out of all the periodicals

included in Agami and Kollaritsch's (1983) *Annotated International Accounting Bibliography* (The Bibliography). It has also been highly ranked in journal ranking studies (Benjamin & Brenner, 1974; Houghton & Bell, 1984; Howard & Nikolai, 1983; Hull & Wright, 1990; Nobes, 1985; Reeve & Hutchinson, 1988). It is also recognized within the international field as an important journal and as having a long and consistent publication history, having retained the same editor for a substantial period of the journal's life (Leung, 1988, p. 60; Mintz, 1980, p. 140). Needles (1994) describes why he selected the IJA for his study:

...because it has the longest continuous history of published research in international accounting and for most of this time period was, in fact, the only outlet for this type of research in the United States. (p. 75, see also Needles, 1997)

Westin, Roy, and Kim (1994) make a similar choice and explain it as follows:

An argument can be made for the use of several journals to represent a discipline. It is the opinion of these authors, however, that the use of a single, well selected, core journal is better suited for the methodology employed here. Since this method considers all citations stemming from the journal and makes comparisons across time periods, it is believed that the consistency provided by a single journal is preferable. (p. 27, see also Gustafson & Kuehl, 1974)

By selecting the IJA for this study, we were able to include a longer period of citations to allow a time series analysis of the development of the knowledge base as part of further research.

There are two potential disadvantages of this approach. First, it effectively relies on the judgement of the editorial board of the IJA to select articles relevant to international accounting research for publication. It also means that the particular preference by the editorial board of the journal for (or against) a certain type of research may bias the sample. As mentioned above, however, a review of *The Bibliography* (Agami & Kollaritsch, 1983) indicated that the IJA was represented across a wide cross-section of subject areas. Also, since it was the most highly cited journal in *The Bibliography*, it appears that the editorial board is successfully selecting international accounting articles of significant interest to key researchers in the area. Second, the strength of the American bias likely to be present in the authorship of the articles is a disadvantage. This is a difficult problem to avoid, since many of the highly ranked journals are based in the United States and it is difficult to justify using less well-respected journals in preference. However, as Prather-Kinsey and Rueschhoff (1999) show, the most frequently published authors in those journals are not always from the United States. In summary, the IJA offers a consistent, well-respected, and comprehensive reflection of the literature over the period of the study.

3.1. Database

The citations from all articles in the IJA were entered for the period 1977–1993 inclusive (17 years) except for the last issue in 1993.² All citations from these source articles are

² The length of period analysed ensures that the intellectual structure identified is representative of the base structure of the area. Additional years' data are not likely to significantly impact the structure.

included in the study except for references to case law. The body of citations that form the data for analysis includes books, conference papers, working papers, official pronouncements, foreign language documents, and all from any year before (and potentially including) the last source article year.³

The references from each article were entered in a database and carefully checked for accuracy. For the 16 volumes (42 issues⁴) entered as the sample there were 348 source articles referencing 4502 unique documents. The total citations were 5787, an average of 16.63 citations per source article.⁵ The source articles in Bricker's (1987) study had an average of 25.6 citations per article. Gustafson and Kuehl (1974) report the average citations per article for one journal from each of the discipline areas of finance, management, and marketing. In each case, the average increased over the period of the study. The authors suggest that the average rate of citation may be an indirect measure of the growth in the literature of a discipline. In 1971, the latest year included in their sample, the average rate for finance was 13.7 per article, for management, 18.7 per article, and for marketing, 13.1 per article (p. 447). This suggests that the average citation rate per article for international accounting is at a similar level to finance and marketing some 25 years ago, when their literatures were less developed. The higher rate for accounting as a whole may well be similar to the current rates for these other business discipline areas. Apart from a potential link with the growth of the literature, the lower average citation rate per article may have implications for the levels of citation frequency for documents that are discussed next.

Of the unique documents, 680 were cited more than once, with the maximum number of citations being 36 for Choi and Mueller's (1978) *An Introduction to Multinational Accounting*. There were 420 references only cited twice. Fig. 1 shows the number of unique documents cited at each citation level.

The lack of depth in the citation patterns is reflected in the fact that only 15% of the unique documents cited were cited more than once, and further, over 60% of the documents cited more than once were only cited twice. This suggests that within the literature there is a low level of consensus regarding the important documents (Cole & Zuckerman, 1975). This may be a function of the relative youth of the subdiscipline or its rate of growth (Menard, 1971, p. 21). A related finding is Heck, Jensen, and Cooley's (1991) analysis of the authorship of the IJA. They found that it was unusual for an author to publish more than one article in the IJA, "with only 21 (8.75%) out of 240 contributors having an adjusted frequency greater than 1.00" (p. 11). The large number of different authors would contribute to a low level of multiple citations in a field lacking in a strong underlying theory or having low consensus. Whether the high level of author "turnover" is a function of the low productivity of international accounting researchers (perhaps related to difficulties in access to data) or is a

³ The source articles are all drawn from the IJA, the data from the citations, however, covers the broad range of materials from many journals, books, conference papers etc. . . that authors cited.

⁴ Note that the IJA changed its system of issuing journals from two per year up until 1988 to four issues per year thereafter.

⁵ Note this is a similar number to the manual processing undertaken by Üsdiken and Pasedeos (1995). Bricker (1987) used the SSCI and had 428 source articles generating 10,911 useable citations.

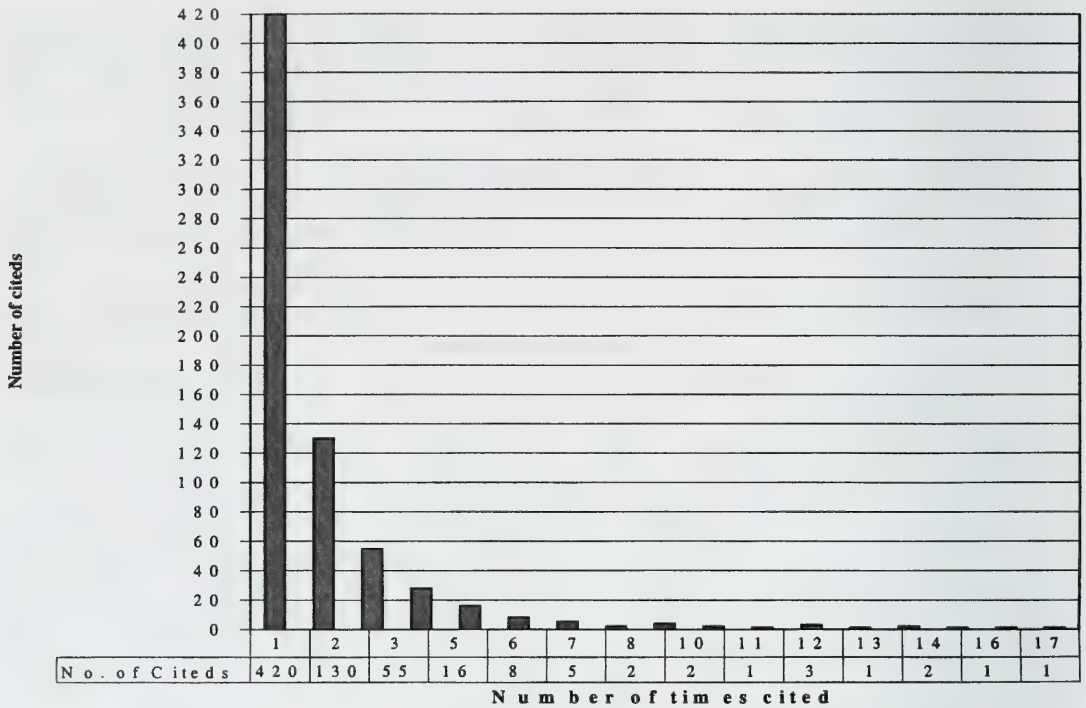


Fig. 1. Frequency of multiple citations.

characteristic of the subject area or the journal cannot be established in this study. It is clear, however, that there is a low level of consensus between the source authors regarding the important work in the international accounting area, since a high level of consensus would generate high citation rates even with many different authors. Another related factor introduced earlier is the lower rate of citation per source article for international accounting. This may be a factor in the lower levels of citation or may be another characteristic of the same underlying feature, the relative newness of the subject as a field. The lack of depth in the citation pattern is also reflected in the co-citation pairing of documents.

3.2. *Highly cited documents and their characteristics*

The 10 most frequently cited documents over the period 1977–1993 are shown in Table 1.⁶ The dominance of books and standards in the most highly cited literature is interesting in the context of Beattie and Ryan's (1991) argument (following Mullins, 1973) that "the publication of a book is indicative of the fact that a theory group within a discipline has reached an

⁶ The database was analysed for self-citations by any of the three source authors recorded for each source and cited document. There were 83 self-citations to 64 unique documents. This is very close to 1.42% of the base figure in both cases. The low percentage of self-citations suggests that this is not a particularly strong tendency in the literature.

Table 1
Top 10 highly cited documents

Citations	Author	Title	Type	Year	Reference
36	Choi, F. D. S. & Mueller, G. G.	An introduction to multinational accounting	B	1978	Englewood Cliffs, NJ: Prentice-Hall
20	FASB	Statement of Financial Accounting Standards No. 52, Foreign Currency Translation	S	1981	Stamford, CT: Author
18	Frank, W. G.	An empirical analysis of international accounting principles	J	1979	JAR, Autumn, 593–605
16	Mueller, G. G.	International accounting	B	1967	London: Collier-Macmillan
16	Nair, R. D. & Frank, W. G.	The impact of disclosure and measurement practices on international accounting classifications	J	1980	AR, July, 426–450
14	FASB	Statement of Financial Accounting Standards No. 8, Accounting for the translation of foreign currency transactions and foreign	S	1975	Author: Stamford, CT
13	Arpan, Jeffery S. & Radebaugh, Lee H.	International accounting and multinational enterprises	B	1981	NY: Wiley
13	FASB	Statement of Financial Accounting Concepts No. 1: Objectives of financial reporting by business enterprises	S	1978	Stamford, CT: Author
13	FASB	Statement of Financial Accounting Standards No. 33: Financial reporting and changing prices	S	1979	Stamford, CT: Author
12	Nobes, Christopher W. & Parker, R. H.	Comparative international accounting	EB	1981	Oxford England: Phillip Allan

Key: B=book, S=standard, EB=edited book, J=journal article.

advanced stage of development” (p. 33). They also analysed the accounting and finance literature to identify the extent and disciplinary source of cited books. They found that book citations represent 17.9% of all cited items (p. 36), and that references to professional and governmental publications were 4.9% of total citations (p. 46). The degree of citation of government and professional publications was seen as an indication of the existence of a gap, widely asserted to exist, between research and practice (p. 33). A difficulty with this type of approach is that there is no way of determining what is a high enough citation rate to suggest a close relationship or a highly formalized theoretical body. However, it is interesting to compare Beattie and Ryan’s results with those of the current study to see how international accounting fares relative to the broader accounting discipline.

In this vein, it is noteworthy that the 10 most highly cited documents consist of four standards, four books, and two journal articles. The books are all specifically international accounting books suitable for use as texts. The earliest of these is Mueller’s (1967) book, which was the precursor of Choi and Mueller (1978). Mueller describes the purpose of the book as providing useful material to a broad range of students and practitioners (p. ix). He

also suggests that it may have a role to play in helping to establish clearer boundaries for the emerging specialty area (p. x). Choi and Mueller state that multinational accounting had come of age and that their book “is the first comprehensive text book in the field” (p. xi). This suggests an interesting progression in the state of knowledge in the area as perceived by these seminal writers. While the first book was intended to assist in the formalization of the area, the second book eleven years later reflects a sense of having attained that goal. Arpan and Radebaugh (1981) suggest that in comparison with other areas of accounting, international accounting lacked courses, books, and articles (p. xiv). They also suggest that their work may be useful to encourage further work in the area. Nobes and Parker (1981) identified the need for a textbook to specifically deal with comparative accounting issues, formalizing, and “refocusing” some of the extant literature (p. x).

This deliberate use of books to try and stimulate the development of an area is contrary to Beattie and Ryan’s (1991, p. 34) premise that the use of textbooks is an indication of the achievement of a level of formalization and “routinization” in the literature. In this view, books are produced in order to maintain the “group’s theoretical perspective” (p. 34). The four seminal books in international accounting have had a pivotal role in providing a base for development of the area, but not through the development of a theory base as suggested by Beattie and Ryan. Rather the emphasis was on descriptive material and classification as a foundation for teaching and further development. It is also interesting that no book from another discipline plays a significant role in the core literature of international accounting.

The standards are all issued by the FASB and suggest the strength of the American influence on international accounting literature as captured through this sample. Two of the standards relate to foreign currency translation and reflect the importance of this topic in the international accounting literature. The other two standards relate to more theoretical issues, and it is interesting to see the significance of measurement issues in accounting reflected in the high citation rates for SFAS 33. The journal articles are closely related, international classification papers that have Professor Werner Frank as a common author. The use of rigorous statistical techniques in these articles in an attempt to address such a broad issue of basic importance to international accounting research attracted significant attention within the specialty.

4. Fragmentation

Fragmentation in the context of a discipline is the state of research when the specialized areas within the discipline become isolated and disconnected. When a specialty area like international accounting becomes fragmented, literature from one area of the specialty is not communicated to other areas and it begins to disintegrate into incommensurate areas of interest. This results in a lack of efficiency in research outputs or even the disintegration of the specialty (Entman, 1993). Fragmentation of the research literature has been identified as a problem in accounting (Bricker, 1987; Manicas, 1993; Mattessich, 1972, 1995). Co-citation provides a basis for assessing the level of fragmentation in international accounting through an analysis of the co-citation pairs generated.

The 5787 cited documents formed 11,377 co-citation pairs of which 1217 were cited more than once (i.e., 10.6% of the total co-citation pairs). There were 9981 unique pairs giving an average co-citation strength of 1.15. The large reduction in the number of documents included in the further analysis suggests that there are low levels of consensus among the source authors regarding the appropriate ideas to link (Braam et al., 1991). Small and Griffith's (1974) calculation of a measure of connection provides insight into the impact of this reduction. The number of unique documents included in the co-citation pairs is identified, and the theoretically possible number of pairs that could be formed from that many documents is then calculated. The measure of connection (c) of the actual pairs achieved is obtained by dividing the number of actual pairs by the theoretically possible pairs, given the number of unique documents included in the pairs:

where a = actual number of co – citation pairs formed and
 n = the number of documents.

The result of applying this formula is presented in Table 2.

The measures of connection are not similar to a measure of significance in that there is no theoretically "correct" level to be attained. The measure is purely descriptive of the degree of connection between the documents in a sample. While the levels of connection reported for the international accounting literature are higher than the minimum possible, they are very much lower than 100%. This suggests that a large number of documents are cited by different source articles and so are never paired. This indicates that the authors of source documents in the literature base perceive a great variation in the documents from which they draw ideas for adding to the body of knowledge.

While there is no benchmark level for connection, it may be compared with the levels found in other studies. Small and Griffith (1974) found that the level of connectedness for the whole Science Citation Index citations for the first quarter of 1972 to be 1.2%. They suggest that this indicates that the structure is loose (p. 22); however, the effect of including multiple disciplines in the calculation is not clear. Bricker (1987) does not provide a calculation of the connectedness of the accounting literature, but there is sufficient detail provided to calculate the percentage at CTL 3, which is Bricker's lowest CTL level. There were 1513 pairs

Table 2
 Connection of pairs

	1977–1993	1977–1981	1982–1986	1987–1991	1992–1993
Actual unique pairs (a)	9981	1194	3796	3045	1744
Unique documents (n)	680	238	390	322	252
Theoretical maximum no. of pairs (t)	230,860	28,203	75,855	51,681	31,626
Actual connection ($a/t\%$)	4.32%	4.23%	5.00%	5.89%	5.51%
Minimum possible connection ($(n-1)/t\%$)	0.29%	0.84%	0.51%	0.62%	0.79%

Note that the number of years included in the last column is smaller than for the others, so the figures for a and n are not comparable with the other 5-year time periods. The connection figure as a percentage is comparable, however.

Table 3
Frequency of co-cited pairs at each co-citation level

Co-citation level	Number of pairs
2	1042
3	128
4	26
5	9
6	4
7	4
8	3
10	1
	1217

including 443 unique documents, giving a connectedness measure of 1.5%. These comparisons suggest that a 4.32% level of connection represents a greater tendency by citing authors to include a wide range of documents.⁷ In the case of international accounting, however, there is also a low level of co-citation frequency. This is directly related to the low levels of individual document citation discussed in an earlier section. The structure of the data with respect to the frequency of pairs at each co-citation level is shown in Table 3.

The underlying lack of consensus and potential for unnecessary fragmentation that the lack of depth in citing indicates are factors relating to the low levels of co-citation.

In summary, the pairs have a relatively high level of connectedness effectively at the cost of a low level of citation frequency. That is, as the pairs formed are summed across all the source documents, because the co-citation frequency is low, there are more unique pairs. Thus, while the cited documents are more connected by the generation of a greater number of connections in the form of pairs, the level of connection between the citing documents lacks depth because they do not frequently cite the same pairs of documents.

5. Intellectual structure

The intellectual structure of the international accounting literature is derived by clustering the co-citation pairs using single link agglomerative co-citation clustering (Bricker, 1987; Garfield, 1979; Small, 1993). This clustering procedure was performed over the co-citation pairs cited more than once (CTL 2). Omitting pairs only co-cited by one source article is a minimal requirement to reduce self-citation and spurious citation problems. The clustering procedure was carried out over each CTL from two to five.⁸ Clustering at higher levels was not useful because of the small number of documents eligible for inclusion and the resulting

⁷ It seems reasonable to conjecture, however, that the connectedness measure is likely to be higher at higher levels of co-citation since only more highly cited papers are included in the calculation. This is also an area that has not received much attention in the literature.

⁸ Note that the CTL is a minimum co-citation strength, so at CTL 5 all pairs co-cited five times or more are included.

small number of clusters generated. At CTL 2, all 1217 pairs formed 42 clusters, while at CTL 5, 21 pairs formed four clusters.

The description of the clusters is based on a content analysis of the titles of the cited documents included in the cluster. Where the title was insufficient to identify the subject area or theme of the document, the abstract or complete document was consulted. In some cases, the source articles citing the clustered documents were checked to ensure that the cluster theme related sensibly to the subject of those articles.

A dendrogram of the clusters formed at each of the CTLs is shown as Fig. 2. Each cluster is given a descriptive title, a number, and the number of unique documents included in it is shown.

To facilitate the process of understanding the intellectual structure represented by the dendrogram from its core outwards, the clusters are described beginning with the highest CTL, which may be described as the core literature.⁹ Areas in which further research may help reduce fragmentation are identified.

5.1. Clusters at CTL 5

At CTL 5, Cluster 1 dominates the structure. It contains most of the documents and includes 6 out of the 10 most highly cited documents. It is the only cluster at this level to contain books of the type, which act to coalesce a discipline area and may be used as textbooks. These include Arpan and Radebaugh (1981), Choi and Mueller (1978), Lafferty (1972), Mueller (1967), and Nobes and Parker (1981). This cluster also includes the key classification studies by Frank (1979) and Nair and Frank (1980), as well as Da Costa, Bourgeois, and Lawson (1977–1978). Cluster 1 has a strong comparative and international accounting classification theme, and this result shows that these works are perceived by citing authors to constitute the heart of the international accounting subdiscipline. Cluster 2 also has a comparative theme, but it contains the survey type studies, which, along with Fitzgerald, Stickler, and Watts (1979) grouped in Cluster 1, were widely used as data for later studies. Professional body standards and reports dominate Clusters 3 and 4. Cluster 3 contains two FASB statements on foreign currency translation. It is interesting that there is such a strong influence from these standards. It suggests both an American dominance in this sample of the literature and also the lack of a major theoretical or empirical research analysis of the issue such as was present in the Comparative/classification literature.

While the professional bodies also dominate the third cluster, the input comes from both the UK and the USA, suggesting a broader influence on the literature. The Sandilands report (Inflation Accounting Committee, 1975) is included in this cluster and may also be seen as incorporating an overview of available theoretical approaches and as such perhaps some theoretical basis is captured in this document.

⁹ Details of all the individual documents included in each cluster are available from the authors.

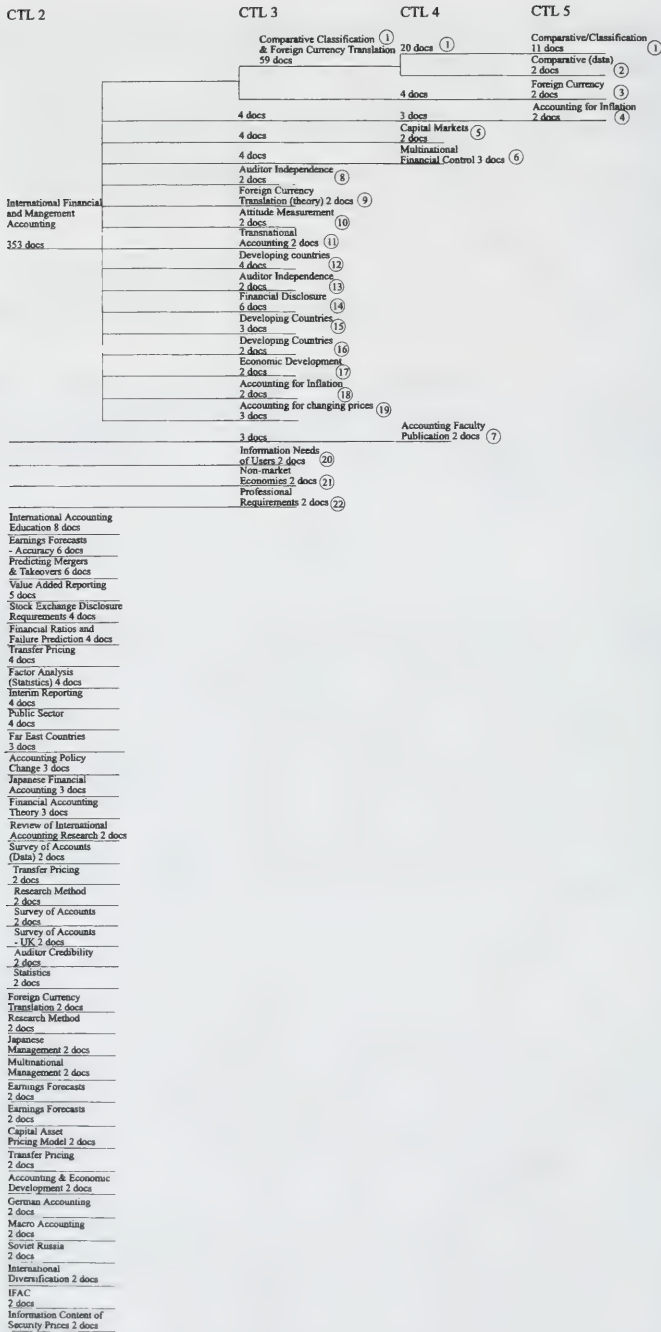


Fig. 2. Dendrogram of the intellectual structure of internal accounting.

5.2. Clusters at CTL 4

Not surprisingly, the comparative survey data documents of Cluster 2 at the previous level merge into Cluster 1 — Comparative/classification cluster at this level, and the Price Waterhouse (1975) survey is added. The comparative theme is continued with the addition of Barrett (1976) and Mueller (1968). The interest in the empirical approaches to classification is also reinforced in the cluster at this level by the introduction of Nobes (1981) “An empirical analysis of international accounting principles: A comment.” Harmonization and the effects of culture appear for the first time in McComb (1979).

The theoretical level of argument in the foreign currency translation cluster emerges at this level with the inclusion of a book by Hepworth (1956) titled, *Reporting Foreign Operations*. The age of this contribution to the area is interesting and suggests that theory development has not progressed substantially from the 1950s. The Accounting Review article by Aliber and Stickney (1975) is similarly reasonably old for a journal contribution to the area to be a highly cited document on the topic.

Cluster 4, Accounting for Inflation, continues to have a strong input from the professional bodies with the only addition being another standard.

An interesting new cluster to emerge at this level has been characterized as Capital Markets (Cluster 5). It includes Ball and Brown (1968) and Beaver (1968). Both documents are seminal works in the area of the relationship between earnings figures and capital markets. These are the first methodological documents without a specific “international” focus to cluster. The application of this approach to many countries with stock exchanges is an obvious extension of the original work and of potential interest to international accounting researchers.

Cluster 6 is derived from a broader business literature and has as its focus the management of multinational businesses. This cluster is the first representative of a management perspective in the international accounting literature, which at the previous CTL was dominated by external financial reporting perspectives.

The final cluster at CTL 4, Accounting Faculty Publication (Cluster 7), is a self-reflective academic type grouping about journal rankings. It has an international flavor, including the “International variations in perceptions of accounting journals,” by Nobes (1985), and appears to reflect an interest in academic publication and a review of international research in the IJA. As would be expected, this cluster does not merge with the main international Comparative/classification cluster at any CTL.

Overall, this CTL reflects an expansion in the types of topic areas clustering and is significant in the emergence of the capital markets cluster, which is so influential in the accounting discipline as a whole (Bricker, 1987).

5.3. Clusters at CTL 3

This cluster run with $CTL > 2$ required for documents to be eligible resulted in 20 clusters. The foreign currency translation cluster merges with the dominant Comparative/classification grouping. Culture is included for the first time at this level in the form of Hofstede’s (1980) *Cultures Consequences*, Hofstede (1987), and Gray (1988). Foreign currency translation

draws in several new documents and a new topic area, cash flow accounting, emerges in the form of SFAS 95. Reflection on international accounting as a research area is evident in the inclusion of Scott and Troburg's (1980) *Eighty-eight International Accounting Problems in Rank Order of Importance* and Choi's (1981) *Multinational Accounting: A Research Framework for the Eighties*. It is interesting that both these works appear as books. This suggests a greater degree of formalisation of the issue of what direction international accounting should take than would publication as journal articles.

The comparative and classification topic areas in this cluster were boosted by the addition of a further 11 documents. Harmonization and uniformity begin to emerge as an issue with the inclusion of three additional documents. A new element emerging in Cluster 1 at this level is the subject of financial accounting theory with five documents added to the cluster, including the FASB's (1978) *Statement of Accounting Concepts No. 1*, which was one of the 10 most highly cited documents. Although this cluster has been described as Comparative/classification and Foreign Currency, it is clearly diversifying into a range of external financial reporting perspectives with the addition of harmonization and financial accounting theory documents.

Cluster 8 is a new cluster at this level. It has an audit focus, and it appears from the source documents that cite the documents in the cluster that interest is particularly in the role of the accounting professional and independence. It is not integrated with Cluster 13, which has a similar focus, but is based in accounting research literature rather than regulatory or professional bodies' publications.

The emergence of a separate foreign currency translation cluster is indicative of a lack of integration of this material in the literature. The two documents that group to form Cluster 9, appear to differ from the other translation documents in their emphasis on a review or theoretical perspective.

Cluster 4 maintained its clear focus on accounting for changing prices and also remained solely constituted by professional body publications. It added to its international flavor with the New Zealand Society of Accountants' (1982) exposure draft on current cost accounting. It is isolated from Cluster 19, which is also a profession-based, international view of reporting for changing prices. It is surprising that these clusters do not merge given that the Australian and Canadian professional bodies are quite commonly linked with the New Zealand body in discussions of accounting standard setting. This is especially true in the light of the Closer Economic Relations Agreement between Australia and New Zealand. Another inflation cluster that does not merge with the others is Cluster 18. This grouping is a little different in character from the other two in that it is made up of books written by accounting academics rather than publications of professional bodies. It has a more theoretical bias, and it is interesting that this cluster and the professional pronouncements cluster are not integrated in the literature.

The Capital Markets cluster, 5, begins to show its international character at this CTL with both the documents added dealing with stock exchanges outside the United States.

Cluster 10 is a methodological grouping dealing with attitude measurement. These documents are both drawn from an edited book titled *Readings in Attitude Theory and Measurement* by Fishbein (1972).

The 11th cluster is made up of documents produced by multinational regulatory bodies, the United Nations, and the Organisation for Economic Cooperation and Development. The focus is on financial reporting to facilitate international investment.

Clusters 12, 15, and 16 all share a common theme in exploring the role of accounting in developing countries. There is no apparent systematic difference between the different clusters, and once again, it appears to be a topic area which is specifically international in character, but which has not been integrated in the literature. Cluster 17 is also related to the developing country theme and includes two documents by the same authors, Charles K. Wilber¹⁰ and Kenneth P. Jameson. The subject area is economic development.

Multinational Financial Control (Cluster 6) increases by only one document and so the dominance of external financial reporting issues remains unchallenged at this level.

Clusters 14 and 20 have an external reporting emphasis. Cluster 20 focuses on the use of financial reports and does not have an international character. Cluster 14 emerges immediately as a relatively large cluster about financial reporting disclosure issues. While overall this cluster is not particularly international in character either by topic or publication venue, Choi's (1973) article, "Financial disclosure and entry to the European capital market" is an exception.

Cluster 21, which is a new one at this level, contains only two documents and is clearly focussed on accounting in countries with nonmarket economies. Both articles were published in the *IJA* and this is a cluster with an international perspective.

The remaining cluster at this level, Cluster 22, is characterized as dealing with professional requirements. Both publications are by the American Institute of Certified Public Accountants, and discuss education and experience requirements for accounting professionals. The specific inclusion of this cluster reinforces the perceived importance of professional issues in the international accounting literature.

At this level, the international flavor of many of the clusters is clear, but there are a number that appear to link directly into the accounting literature as a whole. The lack of integration in some key topic areas for international accounting, such as developing countries, is indicative either of the early stage of development of this topic area or of a lack of awareness of the literature by some authors or potentially there is a distinction being drawn by the citing authors which is not clear. The first possibility seems unlikely given the age of the journal articles included in these clusters, so exploring the other two options would be a useful strategy for writers in the area.

Table 4 shows the most frequently cited documents in each cluster from CTL 3 to 5.

5.4. Clusters at CTL 2

At CTL 2, the chances of spurious citing by the same author or of less reliable linkages is a significant concern. It does, however, serve the useful purpose of indicating the patterns of nesting for clusters formed at higher levels, as shown in the dendogram discussed in Section 6. At CTL 2, 42 clusters were generated. Out of the 42 clusters, 37 appear for the first time at

¹⁰ Citing authors varied in the spelling of this name, sometimes using Wilbur.

Table 4
Most frequently cited documents organised by cluster at CTL 3 to CTL 5

Cluster no. at CTL		Title	Year	Reference	First author name	Citation count
3	4 5					
<i>Comparative classification</i>						
1	1 1	1	1978	Englewood Cliffs, NJ: Prentice-Hall	Choi, F. D. S.	36
<i>Comparative (data)</i>						
1	1 2	2	1972	Champaign, IL: Stipes	Zeff, S.	10
<i>Forging accounting principles in five countries: A history and analysis of trends</i>						
<i>Foreign currency</i>						
1	3 3	3	1975	Stamford, CT: Author	Financial Accounting Standards Board	14
<i>Statement of Financial Accounting Standards No. 8, Accounting for the translation of foreign currency transactions and foreign...</i>						
<i>Accounting for inflation</i>						
4	4 4	4	1979	Stamford, CT: Author	Financial Accounting Standards Board	13
<i>Statement of Financial Accounting Standards No. 33: Financial reporting and changing prices</i>						
<i>Capital markets</i>						
5	5	–	1968	JAR, Autumn, 159–178	Ball, Ray	9
<i>An empirical evaluation of accounting income numbers</i>						
<i>Multinational financial control</i>						
6	6	–	1973	Harvard Business Review, Sept.–Oct., 80–88	Robbins, S. M.	7
<i>The bent measuring stick for foreign subsidiaries</i>						

Accounting faculty publication							
7	7	-	Attitude measurement and perceptions of accounting faculty publication outlets	1983	AR, Oct., 765-776	Howard, T. P.	4
7	7	-	International variations in perceptions of accounting journals	1985	AR, Oct., 702-705	Nobes, C. W.	4
Auditor independence							
8	-	-	Commission on auditors' responsibilities: report, conclusions and recommendations	1978	New York: Author	American Institute of Certified Public Accountants	6
Foreign currency translation							
9	-	-	The state of the art in translation theory	1977	FBFA, Autumn, 311-325	Patz, D. H.	4
Attitude measurement							
10	-	-	The method of constructing an attitude scale	1972	in <i>Readings in Attitude Theory and Measurement</i> ; M. Fishbein; NY: Wiley	Likert, R.	3
10	-	-	Attitudes can be measured	1972	in <i>Readings in Attitude Theory and Measurement</i> ; M. Fishbein; NY: Wiley	Thurstone, L. L.	3
Transnational accounting							
11	-	-	International standards of accounting and reporting for transnational corporations	1977	NY, UN Center on Transnational Corporations, ST/CTC/5	United Nations	8
Developing countries							
12	-	-	The evolution of accounting in developing countries	1978	IJAER, Fall, 105-120	Briston, R. J.	11

(continued on next page)

Table 4 (continued)

Cluster no. at CTL	Title			Year	Reference	First author name	Citation count
	3	4	5				
<i>Auditor independence</i>							
13	-	-	The effect of gifts, discounts and client size on perceived auditor independence	1980	AR, Jan., 50-61	Pany, K.	3
13	-	-	Perceptions of the independence of the auditor	1976	AR, Jan., 41-50	Lavin, D.	3
<i>Financial disclosure</i>							
14	-	-	Financial disclosure and entry to the European capital market	1973	JAR, Autumn, 159-175	Choi, F. D. S.	5
<i>Developing countries</i>							
15	-	-	<i>The function of accounting in economic development — Turkey as a case study</i>	1967	London: Frederick and Prager Publishers	Seidler, L. J.	6
16	-	-	Private enterprise accounting in developing nations	1968	IJA, Fall, 51-66	Scott, George M.	5
<i>Economic development</i>							
17	-	-	<i>Directions in economic development</i>	1979	Notre Dame, Ind., Uni of Notre Dame Press	Wilber, Charles K.	3
17	-	-	Paradigms of economic development and beyond	1979	<i>Directions in economic development</i> ; C. Wilber; Notre Dame Ind., Uni of N-D; 1-41	Wilber, Charles K.	3
<i>Accounting for inflation</i>							
18	-	-	<i>Asset appreciation, business income and price level accounting: 1918-1935</i>	1976	NY: Arno Press	Zeff, S.	4

Accounting for changing prices						
19	-	-	1984	Stamford, CT: Author, Dec.	Financial Accounting Standards Board	3
19	-	-	1982	Accounting Research Committee, Toronto: Author Authors	Canadian Institute of Chartered Accountants Australian Society of Accountants	3
19	-	-	1982			3
Information needs of users						
20	-	-	1973	JOA, Nov., 64-69	Baker, H. K.	6
Nonmarket economies						
21	-	-	1973	IJAER, No. 1, 135	Gorelik, G.	3
21	-	-	1982	IJA, No.1, 185	Berry, Maureen	3
Professional requirements						
22	-	-	1969	AICPA	Roy, Robert H.	5

this level and the majority of these new clusters contain only two documents. This once again reflects the lack of depth in the citation patterns discussed earlier, and it is important not to draw strong conclusions from the nature of the small clusters emerging at this level.

Of more interest is the nesting of all but one cluster existing at CTL 3 into the large first cluster characterized as International Financial and Management Accounting. This cluster has a strongly international flavor and is clearly the major group of co-citations for the international accounting literature. It includes four more general areas, three of which are drawn directly from the accounting literature, while the attitude measurement cluster is drawn from psychology. The more general accounting areas are auditor independence, capital markets, and accounting for inflation. The other major cluster grouping, Accounting Faculty Publication, which includes 18 documents at CTL 2, remains separate from the major international group suggesting that it has been clearly distinguished by citing authors. Although the cluster does include significant management oriented clusters, especially if the macro accounting approach adopted in the developing countries studies is considered to be more management in style, the financial accounting emphasis is dominant.

The two other significant clusters, formed at CTL 3, which do not merge into Cluster 1 are Information Needs of Users and Nonmarket Economies. The exclusion of the latter cluster is surprising given that it adds four documents at CTL 2 and still does not merge into the main group.

The fragmentation of topic areas is evident in the clusters that form at CTL 2. Multiple small clusters form for the areas of survey of accounts, research methods, and transfer pricing.

International accounting education forms as a relatively large cluster of eight documents for the first time at this level. It includes four books, one by the American Assembly of Collegiate Schools of Business dealing with “internationalizing” the business school curriculum.

Earnings Forecasts is a fragmented area that forms two two-document clusters and a six-document cluster at this level. Overall, the documents in these clusters reflect broader accounting issues, with the exception of the Ferris and Hayes’ (1976–1977) study specifically relating to the United Kingdom and Mak’s (1989) article on the New Zealand situation.

Predicting Takeovers and Mergers forms a large cluster for the first time at this level. This cluster is strongly influenced by the finance discipline with three of the six documents being from finance journals and two of the remaining being from the *Journal of Business Finance and Accounting*. The only potential for an international view in the cluster is a study specifically relating to the United Kingdom (Barnes, 1990).

In summary, the dendrogram shows that significant clusters at higher CTLs do form a large cluster, International Financial and Management Accounting at CTL 2. This forms the core literature for the international accounting specialty. The nature of the literature included in the core is distinctively international and so suggests that the literature of the area is more suited to specialist courses rather than absorption into the traditional areas of teaching in accounting.

The Comparative/classification grouping is the strongest in this cluster, followed by Accounting for Inflation, Capital Markets, and Multinational Financial Control, which are not large but have a greater depth of citing. Financial Disclosure is a relatively large cluster that nests into the major group, but it only forms at CTL 3 before merging. The Developing

Countries cluster all group into the main cluster and could be more significant were it not for fragmentation into many clusters. There remain quite a large number of clusters that are isolated, however, and this suggests that, along with the lack of integration in particular topic areas discussed above, the literature is fragmented. The financial perspective dominates the literature.

6. Summary and conclusions

The analysis of this study suggests that there is a lack of consensus among researchers in international accounting in citing previous work. This may be the result of the area's relative youth or a further reflection of the extent that researchers in the area have differing views about what is important research. The dominance of books and accounting standards in the 10 most highly cited documents is interesting in that it appears that "cutting edge" research in the form of journal articles had yet to make a significant impact on the field, with Frank (1979) and Nair and Frank (1980) being the notable exceptions.

Detailed analysis of the co-citation clusters shows areas of research with common subjects were isolated from one another. This is a basic form of fragmentation in the literature. Areas particularly affected were auditing, foreign currency translation, accounting for changing prices, and accounting in developing countries. While this source of fragmentation is present and is also reflected in the low level of homogeneity measured in the citations, the literature is very cohesive in terms of its reliance on accounting as a reference discipline. This finding suggests that Gernon and Wallace's (1995) call for increased interdisciplinary approaches should not substantially increase the fragmentation of the literature and that a focus on the specific topics identified as fragmented could lead to increased integration in the area.

The dendrogram of the intellectual structure of international accounting literature suggests that there is a core for a distinctive specialty that could form the basis of separate courses in international accounting. While this does not preclude the approach of integration with functional areas in the curriculum, the dendrogram may be used to pinpoint those areas that will not fit into traditional accounting courses.

Finally, this study through the co-citation analysis and dendrogram provides a view of the topics that researchers in international accounting were pursuing and had linked into the field in the period up to the early 1990s. This can form the basis for devising future directions for the area and as a benchmark for further investigation. Further research to extend the analysis to cover more journals and subsequent years will allow an analysis of the nature of developments in the structure of international accounting research since the 1990s.

Acknowledgments

The authors wish to thank Professor Philip Dewe, Andrew Rowatt, two anonymous referees, and the many other colleagues who have offered constructive comments on this paper. The Massey University Research Fund provided resources to support this study.

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Capsule commentaries

GAAP 2000: A Survey of National Accounting Rules in 53 Countries edited by Christopher W. Nobes, *PricewaterhouseCoopers, London, 2000, 126 pp.*

This useful report is based on a questionnaire survey of large accountancy firms in 53 countries. The firms were asked to benchmark their local written rules in force for financial reporting periods ending December 31, 2000 against 62 salient accounting variables in the International Accounting Standards (IASs). The editor was assisted by the Big Five firms plus Grant Thornton and BDO.

Of the 53 countries, 25 are European (including all of the EU countries), 15 are from Asia Pacific, 8 come from the Americas, 3 are from the Middle East, and 2 are from Africa.

The report succinctly summarizes the reported variations, which are keyed to specific IASs and usually even to paragraph numbers. For each country, the variations from IASs are organized into three groupings: the absence of specific local rules, the absence of specific local disclosure requirements, and inconsistencies between local rules and the analogous IASs. Each country is covered in one to three pages.

The editor discusses a number of methodological issues and has reproduced the survey questionnaire.

Copies of the report may be downloaded from the PricewaterhouseCoopers website: <http://www.pwcglobal.com/corporatereporting/>.

UK/US GAAP Comparison: A Comparison Between UK and US Accounting Principles by David Cook and Larissa Connor, *Ernst & Young, London, fourth edition, 2000, xxvii+686 pp. (£49)*

This is a handy, detailed correlation between the authoritative literatures in the US and the UK. Facing pages show the UK position on the left and the US position on the right, all keyed to the relevant statement and paragraph numbers. Two appendices enumerate the authoritative statements in both countries, and the initial chapter summarizes the regulatory settings of UK and US financial reporting. The principal differences between the two countries' GAAP are usefully summarized in a concluding chapter.

Students and academics may purchase copies at 50% off: £24.50, including postage, by writing to the following address: Financial Reporting Group, Attention: Emma Drysdale, Ernst & Young, 7 Rolls Buildings, Fetter Lane, London EC4A 1NH England, UK.

IAS/US GAAP Comparison: A Comparison Between IAS and US Accounting Principles by the Financial Reporting Group of Ernst & Young, London, 2000, xxvii+691 pp. (£49 UK/Europe; £53 (US\$82) rest of world)

The format of this volume parallels that of Ernst & Young's *UK/US GAAP Comparison*: facing pages show the IAS position on the left and the US position on the right, all keyed to the relevant statement and paragraph numbers. Two appendices enumerate the authoritative US statements and those of the IASC, and the initial chapter summarizes the regulatory setting of IAS and US financial reporting. Like the UK/US volume, this is a valuable synoptic comparison between two standard-setting regimes.

The principal differences between the IASs and US GAAP are usefully summarized in a concluding chapter.

Copies of this volume, as well as one entitled *IAS/UK GAAP Comparison*, may be ordered from the IASC's Webstore (see: <http://www.iasc.org.uk>, and click Publications/Other Publications).

Accounting Update compiled by Chris D. Knoops, Erasmus Universiteit Rotterdam, revised monthly

This is an electronic service, furnished without charge, which tracks developments in international accounting and auditing, including pronouncements and other publications emanating from the IASC, IFAC, OECD, FEE, and other international organizations, as well as from the US, UK, and Canada. *Accounting Update* was launched in September 2000 and is provided every month. Hyperlinks are provided to facilitate downloading from the original sources. Interested readers should access the following website: <http://www.eur.nl/topics/accounting/info/au310101.htm>.

Accounting Standard Setting in Europe Fédération des Experts Comptables Européens, Bruxelles, 2000, 44 pp. (free)

This is a useful compilation of data about the accounting standard-setting bodies and enforcement agencies in the EU countries (other than Greece), Norway, Switzerland, the Czech Republic, Hungary, Romania, and Slovenia. Factual information is given about their membership and roles, and addresses are provided. Tables show the membership composition of the bodies, the organizations that may appoint members to the bodies, and how the bodies are funded.

A nice addition would have been a bibliography of articles and books that give more extensive information on the programs in the several countries.

Readers may download this publication at the following address: <http://www.fee.be/publications/main.htm>.

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Book Review Section

The book review section is interested in works published in any language, as long as they are comparative or international in character. The author or publisher of such works should furnish the book review editor with two (2) copies of the work, including information about its price and the address where readers may write for copies. Reviews will be assigned by the book review editor. No unsolicited reviews will be accepted. Suggestions of works that might be reviewed are welcomed.

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Book review

International accounting and comparative financial reporting: selected essays of Christopher Nobes by Christopher W. Nobes, Edward Elgar, Cheltenham, Glos UK, Northampton, MA, USA, 1999, xvi+240 pp. (US\$90).

This book is a carefully edited selection of previously published work by Christopher Nobes, written over a period of 20 years on comparative international financial reporting. It is meant to improve access to an important body of literature published in a wide array of journals. The essays, consisting of papers as well as comments, contain discussions on a wide range of topics organized into five sections by subject matter.

The first section deals with the International Origins of double-entry bookkeeping. The initial paper is entitled “The Gallerani Account Book of 1305–1308” (*The Accounting Review*, 1982) and deals with perhaps the oldest surviving double-entry records in England. By analyzing the treatment of different items such as cash entries, opening and closing procedures, etc., the author concludes that these features “may justify a claim that this account book was part of a double-entry system” (p. 3).

The second paper, “The Pre-Pacioli Indian Double-Entry System of Bookkeeping: A Comment” (*Abacus*, 1987), is a comment on the paper by Lall Nigam (1986) in which he claims the invention of double-entry by the Indians in the 4th century BC. Nobes demonstrates that this claim is merely of a speculative nature.

The second section of the book deals with “Causes of International Differences and Classification of Systems.” It consists of seven papers and comments, and it covers a period of 20 years of fundamental research in the field of comparative international financial reporting.

In the first paper in this section, “A Judgemental International Classification of Financial Reporting Practices” (*Journal of Business Finance and Accounting*, 1983), Nobes proposed an alternative approach for classifying financial reporting practices, combining judgmental elements with rigorous statistical analysis. The second paper, “An Empirical Analysis of International Accounting Principles: A Comment” (*Journal of Accounting Research*, 1981), illustrates this alternative approach.

The impact of these papers on international accounting textbooks was significant, but others have criticized it (e.g., Cairns, 1997; Feige, 1997; Shoenthal, 1989). The next three chapters contain small contributions to the classification literature in the form of comments or replies to the abovementioned criticisms.

The next paper (with M. Lamb and A. Roberts) on “International Variations in the Connections Between Tax and Financial Reporting” (*Accounting and Business Research*,

1998) clearly points out that the interrelationship between tax rules and financial reporting is a very important but rather complex one. This paper “constructs a method for assessing the degree of connection between tax rules and practices and financial reporting rules and practices” (p. 57) and is applied to four countries.

The last paper of this section, “Towards a General Model of the Reasons for International Differences in Financial Reporting” (*Abacus*, 1998), investigates which factors finally cause differences in international financial reporting. Nobes presents his model based essentially on two factors: the strength of the equity markets and the degree of cultural (not “colonial”) influence. An important conclusion is that accounting practice systems, rather than countries, should be classified.

The third section consists of three papers on International Differences and Their Effects. The first paper, “A Review of the Translation Debate” (*Accounting and Business Research*, 1980), analyzes the discussions about the different foreign currency translation methods in the US and the UK. Although this paper is more than 20 years old, it has not lost its relevance, as the FASB’s Statement of Financial Accounting Standards 52 and the UK’s Statement of Standard Accounting Practice 20 are still in force.

The next paper (with J. Norton), “Effects of Alternative Goodwill Treatments on Merger Premia: A Comment” (*Journal of International Financial Management and Accounting*, 1997), is a comment on Lee and Choi (1992) dealing with international differences in accounting for goodwill and its impact on international acquisitions.

The last paper in this section (with S. Miles), “The Use of Foreign Accounting Data in UK Financial Institutions” (*Journal of Business Finance and Accounting*, 1998), investigates how foreign accounting data are used by analysts and fund managers. The technique used is that of interviews with 17 London-based international analysts and fund managers. One of the important findings is that fund managers relied on analysts to restate accounting data, but “a large majority of the analyst interviewees (and all the fund managers) did not restate accounting data to a benchmark, and most did not use available reconciliation data” (p. 132).

Section 4 introduces European harmonization issues and contains six papers that are to be read in the context of the European accounting harmonization through the different Directives (2nd, 4th, 7th and 8th). The first paper, “The Evolution of the Harmonising Provisions of the 1980 and 1981 Companies Acts” (*Accounting and Business Research*, 1983), traces the incorporation of various European (particularly German) ideas into UK legislation.

The second paper (with L. Evans), “Some Mysteries Relating to The Prudence Principle in the Fourth Directive and in German and British Law” (*The European Accounting Review*, 1996), examines the issue of prudence as well as British and German influences on the Fourth Directive and its implementation in British and German law.

The following paper deals with the “true and fair view” (TFV) provisions, under the title “The True and Fair View Requirement: Impact on and of the Fourth Directive” (*Accounting and Business Research*, 1993). The concept of TFV first appeared in the British Companies Acts of 1947/1948, and it was later exported through the 4th Directive into the legislation of the European Union (EU) countries. Nobes analyzes the concept of TFV in different European languages, and he divides European countries into several groups with respect to the effects of having this concept in law.

In the next paper (with G. Diggle), “European Rule-making in Accounting: The Seventh Directive as a Case Study” (*Accounting and Business Research*, 1994), EU rule-making is analyzed using the 7th Directive as a case study. Different key players are identified, as well as the degree of influence they have exerted.

In a paper published in *The European Accounting Review*, Hoarau (1995) defended the idea of mutual recognition with benchmarks, rather than American hegemony in international accounting harmonization. In the following paper, “International Accounting Harmonization: A Commentary” (*The European Accounting Review*, 1995), Nobes briefly reacted, pointing out that “the regretted changes brought about in France from the late 1980s... have resulted from the *choices* made by the French when implementing the Seventh Directive” (p. 195).

The last paper in this section, “Harmonization of the Structure of Audit Firms: Incorporation in the UK and Germany” (*The European Accounting Review*, 1998), with L. Evans, addresses the harmonization of audit regulations (the 8th EU Directive) between the UK and Germany.

Finally, Section 5 contains two papers on IASC harmonization. The first article was published in *The British Accounting Review* (1990), and is entitled “Compliance by US Corporations with IASC Standards.” It tries to identify the potential effects of IASC Standards on listed US corporations, and concludes that “differential requirements of IASs are not obeyed by most listed companies” (p. 233).

A short commentary concludes this section. In “An Empirical Investigation of the Observance of IASC Standards in Western Europe: A Comment” (*Management International Review*, 1987), Nobes disputes the assertions of Douppnik and Taylor (1985), who purported to examine compliance with IASC standards on financial reporting over time and across regions, based on a Price Waterhouse (PW) survey of 1979 and the authors’ own questionnaire sent in 1983 to PW offices, resulting in 50 country responses.

As section 5 contains only material published prior to 1992, when the IASC was beginning to improve its standards and increase its profile, Nobes warns the reader that “Current empirical work would probably show major effects in several Commonwealth countries and on some large continental European companies” (p. xiii).

This book presents a fair overview of the impressive work done by Christopher Nobes. It illustrates his important contributions in the area of international financial reporting.

It is somewhat surprising to find as many as eight comments, together with the 12 articles, in the different sections of the book. Although Nobes advises the reader that “of course, ‘comments’ can only be fully understood and assessed in the context of the original papers and any replies” (p. ix), they are sufficiently intelligible by themselves and have perhaps the advantage of being brief and to the point in illustrating the arguments at stake. They are important as clarifications of arguments.

While the book has many strengths, it will, however, be obvious to the reader that the last section on IASC harmonization was published before the “comparability” efforts of the IASC and the subsequent developments. Although the conclusions in this section were valid at that time, they are, to me, not so relevant nowadays. This part could have been omitted without damaging the content and the purpose of the book.

In summary, Nobes provides a very interesting look at international financial reporting, and I am certain that academic researchers and scholars will appreciate the book as an important and welcome addition to the existing literature.

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Pergamon

The International Journal of Accounting
36 (2001) 259–261

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International
Journal of
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Book review

Principles of Auditing: An International Perspective

by Rick Hayes and Arnold Schilder with Roger Dassen and Philip Wallage. McGraw-Hill, London, 1999, xxi+522 pp.

This book has a distinguished authorship of three Dutchmen and an American. The authors have an exceptional range of experience, including audit practice, academe and central banking, all at the highest level. It might be expected that if there are to be four authors of an international textbook, then a wider cross section of nationalities could be helpful. The Dutch, however, do have a strong international and European outlook. In any case, the textbook does not purport to be a comparative analysis of different national approaches or requirements, but a distillation of what is common around the world, using international standards as the guide. This is timely given the growing influence of international standards on national standards and practice. By way of an introduction, the book is given an enthusiastic welcome by Robert Roussey, Chair of the International Auditing Practices Committee.

The approach therefore has much to commend it, but there are risks:

Does the focus on (international) standards as being the legitimate source of international auditing knowledge cause the text to be “dry”?

I did not find the textbook overly dominated by standards. Indeed, it avoids constant reference to standards, and, by concentrating on their application, ends up being not that dissimilar from established textbooks that focus on the application of a national set of standards! After all, national standards are consistent with the international, and so at the practical level this text is not in fact particularly distinctive. One thing that is quite distinctive, however, is the use of interviews with leading practitioners of international standing. Their experiential viewpoints help to enrich the text and contribute to a book that in any case is quite readable.

Is there too little coverage of case law and governance arrangements rooted in local laws and custom?

I certainly felt that there was less coverage of case law than you get in some nationally based texts, perhaps because there are few principles that emerge as being of truly international application across all legal jurisdictions. Different governance arrangements and board structures between nations also moderate the development of international standards except at a high level. As with the influence of case law, the influence of governance on auditing is an area for comparative analysis, and perhaps more of this could have been done. For example, the choice of an Anglo Dutch company to illustrate a

corporate governance report is a good one, but perhaps more could be done to discuss the different governance traditions of the two countries. On ethics and independence, there is in Chapter 3 a comparison between countries. Although it is of a somewhat descriptive nature, this chapter does begin to demonstrate some of the difficulties in adopting a "one size fits all" approach to a world with diverse cultures and traditions.

Because standards tend to lag behind practice, is there too little coverage of the new audit methodologies and other comparatively recent developments?

The new audit methodologies have been rolled out around the world by the big audit firms and might therefore be expected to feature strongly in an international textbook. However, the standard setters have not fully caught up with this movement in terms of rethinking, reorienting and rephrasing either the national or international standards. The implications of the new audit methodologies for auditing standards are currently under review by standard setters. Arguably, current standards still tend to have an old-fashioned feel, particularly in relation to understanding the business in its strategic context, the business risks, business style, and their relevance for the selection of appropriate control philosophies. With its focus on standards, this textbook, like most others, does not fully engage with the new audit methodologies or their implications. Much of the text, though clear and well written, has a conventional feel and is given over to well-trodden paths on audit planning, internal control assessment, substantive testing, and audit completion. The emphasis is on the traditional notion of the audit as evidence, rather than the slightly different nuance of audit as knowledge. It is on the audit as a professional and technical process rather than audit as social control.

There is, however, a chapter (Chapter 13) on auditing beyond 2000. This is short but good, as far as it goes. It includes coverage of the IFAC assurance framework, the work of Robert K. Elliott on the future of assurance services, the difficulties of dealing with complex financial instruments, reporting on internal controls, the environment, and risk.

One area where there has been much development in practice is the adoption of enterprise planning and other standardizing, integrative computer systems. Another area is the arrival of the Internet, e-commerce, and the knowledge economy. These are developments driving the global economy and, hence, indirectly the demand for international standards. One impact of these developments is the growing significance of information outside the traditional boundaries of the financial statements. I believe that the coming generation of leading textbooks and e-learning materials ought to provide significant discussion of these issues, and I did not feel that this textbook was altogether convincing in this regard.

Does the focus on (international) standards mean that the many insights of academic research are neglected?

In my opinion, there are very few, if any, textbooks that successfully integrate academic auditing research and professional material. I did not find this book to be an exception. The authors have repeated material from both the professional (mostly) and academic (more occasionally) literatures where they felt it to be of a high standard and not easy to improve upon. This is good. Nevertheless, there is not an effective overview of academic research and whether/how it challenges the current orthodoxies embedded in the standards. Perhaps, given the pedigree of the authorship and the Dutch tradition of practitioner-academics, I

had expected a stronger bibliography. Again, this would not necessarily be a weakness if the book were aimed solely at professionals, but it is a weakness when it is aimed at university students, especially those at postgraduate level.

Drawing these thoughts together, this textbook claims to be the first auditing text to describe and explain International Auditing Standards. I believe this claim is true, and it captures the mood of global standards for a global economy and global capital markets. However, I am unsure of its ultimate significance at either a practical or a theoretical level. Much of this book deals with professional principles and practice, and these are consistent with both national and international standards. Consequently, the book is not radically different, at a detailed content level, from many extant English-language textbooks. It is similar to most of these books in following standards rather than the newer audit methodologies, and in focusing on the traditional financial audit rather than on new assurance services and other topical issues. My criticisms of this particular book are therefore relevant to all current textbooks and ultimately, in my opinion, relate to the overly technical orientation of many university courses in auditing, due largely to the influence of accreditation.

It is, however, a well-written and well-presented textbook, with many good features such as the interviews with international practitioners. In addition, there is a valuable chapter on how to do an audit, with good coverage of the planning process. The authors claim the text contains the latest on governance, internal control, and audit technology. Certainly, these issues get good coverage, but I am a little skeptical as to whether the focus is on the "latest" thinking. It is, in essence, a practical book and is well endowed with checklists, questionnaires, and a good glossary. It resists the temptation to provide the attendant slides, teaching manuals, and computer disks typical of many US texts. These do tend to encourage a systematic but rather unchallenging learning environment.

Overall, this is a thoroughly competent book, highly suitable for the current genre of undergraduate programs, and stands well in comparison to the existing market leaders. However, many undergraduate programs receive accreditation from national professional bodies, and generally such bodies expect a focus on national standards. No doubt, this will change, and, when it does, textbooks that already follow the international standards will be well positioned. Is it even possible that the existence of an international textbook might hasten this change?

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Pergamon

The International Journal of Accounting
36 (2001) 263–265

The
International
Journal of
Accounting

Book review

Financial statement analysis. An international perspective by Peter Walton, Business Press/Thomson Learning, London, 2000, vi+305 pp.

Accounting is a difficult subject for managers without a business or an accounting degree. Nevertheless, every manager needs a minimum knowledge of accounting information in order to understand better the situation and perspectives of the firm. On the other hand, all decisions have economic consequences, which in most cases can be measured using accounting techniques. Because of this, a knowledge of accounting can help the manager to take more rational decisions.

As the Preface states, this book has been conceived as a support for MBA courses whose objective is to provide students with a working understanding of accounting and the meaning of accounting numbers. Financial reports and their understanding are the central issue of this book. It does, however, aim to go beyond that, and it sets out to deal with a wide range of accounting-related issues of interest to the business manager and to provide background knowledge usually absent from a textbook. *Financial Statement Analysis* assumes that the reader has no prior knowledge of accounting, which is the situation of many of students at the beginning of an MBA program.

The book is divided in five parts. Part 1 looks at the environment within which financial reporting takes place and what an accounting department in a company does. In this part, annual financial statements are introduced as well as the uses of these statements and accounting regulation. The author explains how accounting is controlled by governments, the stock exchanges and other institutions. Other areas analyzed in Part 1 relate to accountants and their profession. It also introduces independent accountants, the auditing profession and the external audit.

Part 2 goes deeper into the study of the basic financial statements: the balance sheet and the profit and loss account. The construction of these statements is explained in a manner that can be useful not only for accountants but also for managers who will be users of accounts. This is the reason why bookkeeping techniques are not explained. No doubt this is a sensible option that reduces the unnecessary and more tedious aspects of accounting for managers. The presentation is based on worksheets that show what is happening in the company's accounting database, rather than the formal bookkeeping techniques, which involve debits and credits. This method is very useful when we try to teach accounting to non-accounting people. In this part, the author covers important topics such as measurement concepts, accrual accounting, fixed assets and depreciation. The book aims to go beyond the traditional financial accounting framework. This is the reason why current topics like the limitations of

the present conceptual accounting framework as well as relevant costs, hidden reserves and intellectual capital are introduced in this part.

Part 3 offers an introduction to financial statement analysis. The subjects covered include financial structure, working capital management and performance measurement. The tools presented are the traditional ones: time series analysis, cross-sectional analysis, management performance ratios and financial strength ratios. Cash flow statements are also studied in this part, particularly how to construct and analyze a cash flow statement.

The accounts of multinational companies are explained in Part 4. It covers how group companies prepare consolidated accounts in order to be able to present a worldwide picture of their economic situation. This part studies topics like group accounts, foreign operations, currency translation, translation of subsidiaries, segment reporting, international taxation and auditing and corporate governance. Proof of the international focus of the book is the length of this part, 90 pages, which represents nearly one-third of the book. Furthermore, throughout the book, there are numerous excerpts from pertinent International Accounting Standards. As in the rest of the book, this part includes hot topics such as earnings management and environmental disclosures, which are currently subjects of large debates in academic and business forums.

Part 5 goes back to the analysis of financial statements. It is devoted to the study of more sophisticated techniques, which include strategic ratios, *Z* scores, growth calculations and shareholder value, among others.

Finally, the last chapter in this part provides a few bridges towards further study of financial reporting. Among other things, it points toward some of the next developments in accounting regulations, such as the introduction of fair value in some IASs.

An important feature of the book is that it is not situated in any one national regulatory base, and it is intended to be usable in any national context and applicable to most multinational companies. The technical accounting references are the standards of the International Accounting Standards Committee, which are introduced in the majority of the topics covered, as mentioned before. The examples are drawn from many different countries. This orientation can be very useful for managers with an international focus.

The book is very well executed. The ultimate objective of the book is to enable accounting information to be used effectively. This objective is well achieved overall. The language is rigorous but easy to read. Every chapter has specific objectives and a summary. The book includes many examples from the financial statements of very well known international companies, such as Nestlé, General Electric, Cap Gemini, SAS, Lufthansa, Nokia, Volvo, Roche, Cadbury Schweppes and Bosch, among others. These examples can help to increase the interest of the student in the topic. Another feature of the book is that it includes many worked examples and questions at the end of each chapter, including exercises to be solved by the reader. These questions are powerful tools to practice the concepts explained. It would be valuable if these questions were solved at the end of the book to facilitate self-evaluation by the student. Another suggestion would be to provide a short list of references at the end of each chapter, which could be used by students interested in deepening their knowledge of the subject. In any case, the material provided by the book is sufficient for the needs of an MBA student. Another feature of the book is that it can be read by omitting chapters that are not interesting to a particular reader.

In spite of the stated aim that the book is intended for students and managers with no prior knowledge of accounting, some basic knowledge of accounting is needed in order to understand all of the topics covered in the book.

To conclude, MBA students and business managers will find the main features of this book very helpful: rigorous but easy-to-understand language, an international orientation, strong emphasis on the framework of the International Accounting Standards, insights that go beyond the traditional financial accounting framework, worked examples coming from many countries and end-of-chapter questions. I am sure that many lecturers will adopt this book as the basis for MBA accounting courses, especially if they want to provide an international emphasis to the program.

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Pergamon

The International Journal of Accounting
36 (2001) 267–270

**The
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Book review

The Future of Corporate Governance: insights from the Netherlands by Ian Fraser, William Henry and Philip Wallage; The Institute of Chartered Accountants of Scotland; Edinburgh, Scotland, 2000, xx+ 228 pp.

There are few topics that are more important to the accounting and auditing profession than corporate governance. There are a number of proposals in the US to improve the effectiveness of audit committees and provide oversight of the auditing profession. Corporate governance, however, is a much broader concept, dealing with such issues as who should provide oversight, the nature of that oversight, and reports that should be provided to those performing the oversight activities.

This research monograph provides a European view of corporate governance and is a valuable addition for anyone interested in corporate governance or performing research on corporate governance.

In the preface to the monograph, Curtis Verschoor, the Ledger and Quill Research Professor at DePaul University, states:

Internal auditing has been undergoing considerable re-evaluation and self study. Its potential to provide valuable services has never been greater . . . These proposals [contained in this monograph] should be carefully considered by thought leaders in corporate governance in the US as well as those in the internal auditing profession. (p. ix)

I concur with that recommendation and urge all parties, including external audit thought leaders, to examine this monograph and the basis for the recommendations contained in this research.

1. Major contributions of the research

The monograph does an excellent job of integrating the views on corporate governance across Europe and the US. Some European countries, especially the Netherlands and Germany, have developed the concept of a “supervisory board,” which operates independently of management and of the corporate board. These supervisory boards provide oversight for stakeholders beyond stockholders. In many companies, the supervisory board (or committee) has vast powers, including the authority to change management. The supervisory board exists in companies that also

have audit committees. The monograph enhances our understanding of alternative corporate governance structures.

The book proceeds by:

- Reviewing recommendations made in the *Auditing into the Twenty-first Century* issued in 1993 by the Institute of Chartered Accountants of Scotland.
- Reviewing Anglo-American and Dutch work on corporate governance and the auditor's role in governance processes.
- Developing insights on corporate governance through interviews with executives of three Dutch companies, including the directors of internal auditing.

The researchers examine cultural differences between Scotland (where the recommendations originated) and the Netherlands to see if the recommendations work in a different culture. We often talk about cultural differences, but unfortunately, we spend little time examining the implications for corporate governance. This monograph does a terrific job in bringing cultural differences to our attention. It also focuses our attention on other forms of corporate governance to help us understand whether or not proposals made in our economy would work as effectively elsewhere.

The monograph does an excellent job on the first two points (examining corporate governance and making recommendations for auditing in the 21st century), but it is less effective in the section examining corporate governance in the three Dutch companies. The researchers provide interesting insights that are not often seen in the US literature. It does an excellent job in comparing and contrasting major works on corporate governance such as the Cadbury Report, the McFarlane Report, the Turnbull Report, (all from the UK), the Macdonald Report (Canada), the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (US), as well as others. This is the best single review of the similarities, differences, and implications of these reports that I have seen. The book is worth purchasing just because of the authors' review.

The monograph performs a thorough review of the recommendations made in the *Auditing into the Twenty-first Century* (21st Century) research committee report. Before reviewing these recommendations, I would like to digress briefly to talk about audit committee proposals that have recently been advanced in the US. These proposals push greater responsibility onto audit committees in such areas as reviewing the appropriateness of accounting principles, the adequacy of internal controls, and the independence of the external auditor. These proposals come when audit committee members are increasingly concerned about their legal responsibilities and when there is little evidence that existing audit committee members have the time, expertise, background, or information to perform the activities suggested for them. The research monograph presents another view advanced by the 21st Century committee. That view is that organizations ought to have Financial Reporting and Audit Committees with sufficient time and resources to evaluate the controls over major business processes. Further, the internal audit function ought to report directly to this Financial Reporting and Audit Committee and should provide the committee with sufficient information to properly assess the business controls and the

quality of financial reporting. In addition to this proposal, the 21st Century committee also proposes that the external audit function become "external assessors," and the external assessors should focus on evaluating the work performed by the internal auditors. This is a significant proposal.

The research interestingly reviews the recommendations contained in the 21st Century report developed in Scotland to see whether or not they would work in a different corporate governance culture such as that found in the Netherlands. The proposals are listed below in italics along with a brief comment on the research findings.

Proposal 1: Each company should appoint a strong internal audit team that is capable of providing the Financial Reporting and Audit Committee with sufficient information to fulfill its responsibilities on behalf of the board.

The researchers find support for this proposal and develop recommendations for strengthening the internal audit function in Dutch companies.

Proposal 2: The findings of each investigation by the internal audit function should be reported to the chief executive, the Financial Reporting and Audit Committee, and the external assessors.

This proposal is quite common, although the notion of "investigation" needs to be better defined.

Proposal 3: (an extended proposal). The chief internal auditor should report on the establishment and effectiveness of management information and internal control systems, and on the conformity of financial statements with the accounting records and legal and accounting standards.

The researchers suggest the above requirement be extended to include the identification of significant business risks; the effectiveness of financial, operational, and compliance controls; the quality of management information and the *effectiveness of management* (emphasis added). This recommendation is consistent with the movement of internal auditing on a global basis, with one exception. The reporting on the "effectiveness of management" is new and is consistent with the cultural difference that focuses on a supervisory committee evaluating the effectiveness of all operations, including the effectiveness of management in accomplishing organizational objectives.

Proposal 4: The external auditors should be renamed the external assessors and that, to a considerable extent, the external assessors would carry out their work by assessing the work of a company's internal auditors.

The authors assert that this recommendation is consistent with the cooperation seen between the external and internal auditors in the Dutch system and the movement of external auditing to a strategic systems-based approach.

Proposal 5: An Independent Audit and Review Panel should be established to take responsibility for the supervision of the assessment process on behalf of the primary stakeholders, while being responsive to the needs of the secondary and tertiary stakeholders.

This proposal recognizes (a) the weaknesses in the focus only on audit committees; and (b) the recognized need to serve stakeholders beyond shareholders.

Proposal 6: The Audit and Review Panel should be proactive in supervising the work of the external assessor to make sure it is performed with due rigor, and is to perform a

periodic review of the internal audit function to confirm its effectiveness and independence within the organization.

These are interesting proposals to enhance overall corporate governance, and they suggest interesting changes to the auditing profession. Anyone interested in corporate governance should take the time to read the detailed rationale for these proposals.

2. Weaknesses of the monograph

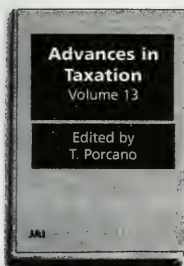
A weakness of the monograph is that the review of the three Dutch companies tends to be repetitious and not very insightful. In addition, I am surprised that a monograph with a 2000 copyright has not been updated to reflect the change in the definition of internal auditing that was approved by the board of directors of the Institute of Internal Auditors in June 1999. It is a major omission in a monograph that focuses as heavily as this one does on internal auditing.

3. Recommendation

Good research should: (a) provide new insights; (b) challenge traditional thinking, help us understand new phenomena or, as in this case, examine the applicability of existing findings to a different cultural setting; and (c) stimulate the reader to think more deeply about fundamental issues. This monograph succeeds on all three of these criteria, but, most importantly for me, it forced me to rethink assumptions and recommendations regarding the effectiveness of audit committees. It suggests a form of corporate governance that might be more effective than existing US proposals. It also suggests ways in which we can include governance input from other major stakeholders. There is a lot to learn in this monograph. It includes an excellent bibliographic reference section and it does not take long to read. I heartily recommend it to anyone interested in corporate governance or internal auditing.

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Advances in Taxation, Volume 13



Edited by:
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Miami University, Oxford, Ohio, USA

2001 176 pages
ISBN 0-7623-0774-9
Hardbound
Publication: June 2001
Price: NLG 168.00 / USD 83.00

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OF ACCOUNTING

ISSN: 0020-7063

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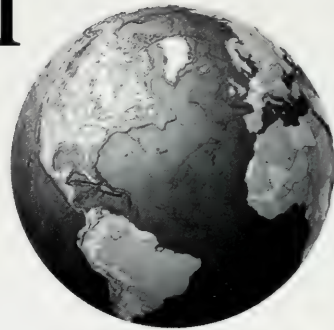
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The International Journal of Accounting



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Name of publication: **THE INTERNATIONAL JOURNAL OF ACCOUNTING** (ISSN:0020-7063)
Office of publication: Elsevier Science Inc.
655 Avenue of the Americas
New York, NY 10010-5107

Published quarterly. Annual institutional subscription rates for 2001: European countries, NLG 565.00 (euro 256.39); all countries except Europe and Japan: US\$289. Associated personal price for 2001: all countries except Europe and Japan: US\$112.

POSTMASTER send address changes to:

Subscription Dept.: Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010-5107.

Editorial Office: Center for International Education & Research in Accounting
320 Wohlers Hall
1206 South Sixth Street
Champaign, IL 61820
217-333-4545; 217-244-6565(fax)
E-Mail: gillham@uiuc.edu

Editor: A. Rashad Abdel-khalik

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0020-7063(2001)36:3;1-K

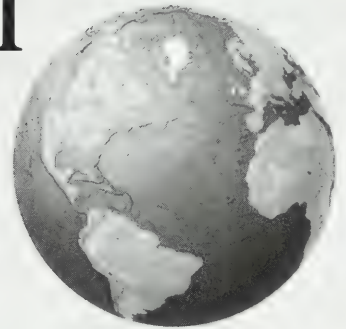
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The International Journal of Accounting
36 (2001) 271–290

The
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The impact of national influence on accounting estimates: Implications for international accounting standard-setters

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Abstract

The results of prior research suggest that national accounting systems are significantly associated with differences in market valuations and various other macromeasures. These results, however, rely heavily on the analysis of archival data or survey evidence directed at national system differences. As Pownall and Schipper [Accounting Horizons (1999) 259] note, archival research necessarily depends on the information in the financial reports and cannot explain the process linking the underlying standards to the reported information. This study examines this process by investigating judgments made by accountants in France, Germany, and the United States. To facilitate a comparison of this process across international boundaries, our experiment presents these accountants with the *same economic facts that are governed by similar financial reporting rules*. Our results indicate that, even given similar facts and rules, judgments among the three nations' accountants vary significantly. They also suggest that national culture interacts with findings accepted as general within behavioral decision research. © 2001 University of Illinois. All rights reserved.

Keywords: International accounting standards; Uniform; Harmonization; De jure; De facto; Financial reporting

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1. Introduction

Previous international financial reporting research has focused on developing an understanding of the different effects that national accounting *systems* have on firm valuation (e.g., Saudagaran & Meek, 1997; Tay & Parker, 1990; van der Tas, 1988). The general conclusion of this research is that different financial reporting systems have diverse effects on firm valuation. The purpose of this paper is to extend the current literature by investigating whether the factors associated with system differences tend to affect differences in individual accounting judgments when the accounting standards across countries are nearly identical. In contrast to the prior literature, our study focuses on the individual judgment of accountants who are faced with similar accounting standards. Thus, our study has the capability of addressing whether uniform accounting standards will result in comparable financial reporting across borders.² Our work is motivated by the decision of the Securities and Exchange Commission (SEC) to consider the implementation of uniform international accounting standards.

Several recent studies question the inferences that can be drawn from the prior literature due to limitations in the research designs employed (Gernon & Wallace, 1995; Pownall & Schipper, 1999; Prather & Rueschhoff, 1996; Saudagaran & Meek, 1997). For example, Pownall and Schipper (1999, p. 261) point out that archival studies necessarily depend on reported information and cannot detect differences that might arise in the process linking countries' standards and reported information. Specifically, they note that "existing research methods cannot in general distinguish the effects of standards from the effects of interpretation/application." Our primary objective is to address the concerns of Pownall and Schipper by investigating whether the financial reporting judgments made by accountants in different nations are consistent when those accountants are faced with the same economic facts and similar financial reporting standards. Thus, our study addresses the issue of the cross-border effects of "interpretation/application" on financial reporting.

² The issue under consideration is whether consistent standards [such as those being considered by the International Accounting Standards Committee (IASC)] are being interpreted consistently across international boundaries. The IASC will develop consistent standards with the objective of achieving comparable financial reporting across countries. This will only be achieved if the standards are applied consistently across countries. While we are not examining the application of an "international accounting standard," we are examining a consistent standard across these countries, which is the objective of the IASC. SFAS 5 (FASB, 1975) governs the accounting for warranty expense in the United States. According to SFAS 5, the estimated amount of warranty expense should be charged to income if the following two conditions are met: (1) on the balance sheet date, it is probable, from information available before the release of the financial reports, that the entity has incurred a liability, and (2) the entity can reasonably estimate the amount of the warrant expense. Afterman (1995) indicates that the accounting rules governing the recognition of contingent losses in France and Germany are similar to those in the United States. That is, all three countries require the accrual of likely (probable) contingent losses. Further, the accounting for contingent losses in all three countries is subject to relatively broad guidance, which is generally characteristic of international accounting standards. Brackner (1985) expresses concern over the diversity that exists in the application of SFAS 5 with respect to the estimation of future events or probabilities. This same issue is addressed by Afterman (p. B10.04) when he indicates that contingent loss accruals are subject to manipulation for the purpose of income smoothing in France and Germany.

Several influential actors in the standard-setting arena have argued in support of international accounting standards as a basis for bringing consistency to financial statements across nations (e.g., Beresford, 1990; Wyatt, 1989). However, Bindon and Gernon (1995) note that the principal benefit of harmonization is to set a floor requirement that leaves a wide elective range for what is actually disclosed. Tay and Parker (1990) and van der Tas (1988) warn that there is a difference between *de jure* and *de facto* accounting where *de jure* accounting represents consistency in form or rules and *de facto* accounting represents consistency in actual application. Contrary to the opinions expressed by Beresford (1990) and Wyatt (1989), Van Hulle (1997) has expressed the view that *de facto* application across nations would not necessarily arise due to *de jure* consistency.³ Thus, there is no clear consensus on the effect of uniform international accounting rules on financial reporting across countries.

Our primary finding is that uniform international accounting standards are not likely to result in *de facto* uniformity among nations, particularly when the standards allow for significant discretion in application. Our study also provides mixed support for propositions rooted in behavioral decision theory. The most interesting result supports the notion advanced by Sharp and Salter (1997) that national cultural characteristics may interact with behavioral propositions. Our results are consistent with the interpretation that experienced accountants from countries high on uncertainty avoidance are more sensitive to framing effects than accountants from low-uncertainty avoidance countries. These results suggest that the phrasing of international accounting standards or the way that accountants interpret those standards may play an unintended role in accounting measurement across nations.

Our findings have important implications for international accounting standard-setters. The international accounting community has undertaken the costly task of reviewing current cross-border accounting standards based on the implicit belief that uniformity will result in consistent financial reporting across countries. Our results question the validity of this assumption, particularly where the underlying economics involve uncertainty and ambiguity. We provide evidence on the cross-border application of extant accounting rules, which may assist accounting regulators in the promulgation of uniform international standards. We believe these results are important to the SEC's assessment of international accounting standards. Specifically, undue latitude in international accounting standards may result in significant differences in reported amounts.⁴

The remainder of the paper is organized as follows. Section 2 provides a discussion of the theory background and hypothesis development. Section 3 outlines the research design and methodologies employed. Section 4 presents the empirical findings and Section 5 provides a brief summary and conclusion.

³ Van Hulle is the principal party responsible for the harmonization of accounting rules with the European Union.

⁴ Some accounting treatments are likely to involve judgment latitude. Accounting estimates represent an example as the recorded amounts depend on an assessment of future events. In such cases, standard setters in accounting and auditing can work together to constrain wanton interpretation and application. Wallace (1993) discusses several issues bearing on this matter.

2. Theoretical background and hypothesis development

Previous accounting research has developed a link between numerous factors and differences in national accounting systems (Saudagaran & Meek, 1997). These factors include legal systems, the relationship between the providers of capital and enterprises, tax systems, inflation patterns, political and economic ties, levels of economic development, and education. Various authors have proposed comprehensive explanatory models incorporating these and other variables (e.g., Gray, 1988; Perera, 1989; Schweikart, 1985). Arguably, Douppnik and Salter (1995) represent the most comprehensive empirical study of these factors. Their study includes environmental, institutional, and cultural variables. We investigate the impact of their most influential variables on judgments made by accountants when faced with the same facts and governed by similar accounting guidelines.

2.1. National differences in accounting systems

Douppnik and Salter (1995) consider work by Gray (1988), Harrison and McKinnon (1986), Robson (1991), and Schweikart (1985) to establish the theoretical underpinning of national accounting development. Schweikart proposes that environmental factors (e.g., economic, educational, political) condition the institutional structure (e.g., corporations, stock exchanges) and the decision-makers (e.g., investors and lenders) across nations. These structures, subject to the cultural idiosyncrasies, contribute to the type and amount of information provided to the public in a particular country. Gray identifies four primary values that distinguish national accounting systems. His accounting values, primarily a function of culture, consist of: *professionalism (versus statutory control)*, the extent to which a nation's accounting system allows for a broad range of personal judgment versus rigid, legalistic control; *uniformity (versus flexibility)*, the degree to which a system allows for the differential handling of idiosyncratic accounting events; *conservatism (versus optimism)*, the extent to which a system prefers a cautious approach to measurement to cope with the uncertainty of future events versus 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. Harrison and McKinnon conclude that accounting system change relies principally on intrusive events, intrasystem activity, transsystem activity, and cultural environment. Robson posits that accounting systems change to provide a vehicle to translate economic needs to other extant systems within the environment.

From this theoretical base, Douppnik and Salter (1995) settle on three principal categories that determine a nation's accounting development — the external environment, cultural values, and the institutional structure. Using this framework, they test environmental measures for: (1) legal system, (2) nature of the relationship between business enterprises and providers of capital, (3) tax laws, (4) inflation levels, (5) level of education, and (6) level of economic development. Relying on Gray's (1988) work, they also include Hofstede's

(1980) four cultural variables: (1) individualism/collectivism, (2) uncertainty avoidance, (3) power distance, and (4) masculinity.⁵

They gather survey responses from 174 experts on 100 accounting practices in 50 countries. Cluster analysis of their survey results conforms closely to Nobes' (1983) micro-based and macro-based accounting system categories. Micro-based systems in this context are characterized by comparatively complex, less conservative measurement practices and generally higher disclosure than macro-based ones. Notably, the United States falls at the extreme end of the micro-based system countries, while France and Germany are included among the macro-based countries (with Germany next to the most extreme).⁶

Doupnik and Salter (1995) perform canonical analysis and other tests that relate the underlying dimensions of accounting practice to their 10 predictor variables.⁷ Their results show that the legal system variable is very important, with code-based countries leaning heavily toward macro-based system indicators. Uncertainty avoidance and reliance on equity capital are the two other very significant variables. Uncertainty avoidance is positively related to macro-based system indicators and reliance on equity capital is negatively related to macro-based systems. These three variables dominated the other predictor variables in the analysis.

Doupnik and Salter (1995) suggest that the legal system is an institutional indicator that influences not only how accounting rules are promulgated but also the content of the rules. For example, code-based systems generally are more rigid and allow for less discretion in application than common-law systems. Radebaugh and Gray (1997, p. 49) identify France and Germany as examples of countries with traditions of code-based law and the United Kingdom and the United States as representative of countries with a common-law heritage.

Doupnik and Salter (1995) report that countries that rely on equity-based financing will generate more sophisticated accounting information, because stakeholders in these countries have limited access to alternative sources of information. That is, in countries where bankers, governments, or families are the primary sources of financing, access to private information reduces the need and desire to develop more open and informative

⁵ In a massive global study of IBM personnel, Hofstede (1980) isolated four cultural dimensions that relate to how societies organize and view the workplace. 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. Later work by Hofstede (1991) and Hofstede and Bond (1988) argue for a fifth dimension, Confucian dynamism — long-term orientation. However, Yeh and Lawrence (1995) cite a data problem in this work, showing that once an outlier is removed, Confucian dynamism disappears and is absorbed by the concept of individualism.

⁶ Nobes (1998) modified his prior accounting classification schemes. In his 1998 work, he proposes a two-way classification using two variables; the strengths of equity markets and the degree of cultural dominance.

⁷ The study includes 11 predictor variables with two included for equity-oriented financing sources: market capitalization as a percentage of GNP and total value of market capitalization.

accounting systems. Radebaugh and Gray (1997, p. 55) indicate that share ownership is much more widespread in the United States than in France and Germany. They also indicate that the government is a major source of financing in France, while in Germany banks are the major source. Radebaugh and Gray also cite evidence from the International Finance Corporation (1993, p. 10) showing that in 1992 the United States had just under one-half of all market capitalization in the world and over 13 times as much as France and Germany.

Doupnik and Salter's (1995) other major predictor was Hofstede's (1980) uncertainty avoidance dimension. We believe that cultural differences play a special role in defining the differences in the development of accounting systems and particularly individual judgments related to accounting measurements and disclosures. Our beliefs are similar to those of Gray (1988), who suggested that cultural values arise over long periods and contribute to the formation of institutions and other environmental elements. Our notion is further supported by the definition of culture offered by Hofstede (p. 25). He defines culture as "a collective programming of the mind which distinguishes one group from another."

In the context of our study, which involves the measurement of warranty expense, conservatism appears to be the most relevant characteristic. Gray (1988, p. 10) supports this contention. He notes that conservatism "would seem to be the most significant accounting value dimension" due to its pervasive role in accounting measurement. The intuition behind this argument lies in the notion that warranty expense relies on future outcomes and accountants surrounded by societal values stressing conservatism are more likely to adopt a more cautionary measure than those in other, less conservative settings.

Table 1 shows Gray's (1988) expected relationships between conservatism and Hofstede's cultural dimensions. In discussing his framework, Gray posits a *strong* positive relationship between conservatism and uncertainty avoidance and a weaker link between individualism and masculinity and then *only where uncertainty avoidance is low*. Table 1 shows that France ranks high on uncertainty avoidance (tied with six other countries in spots 36–41 out of 50 total countries). Germany ranks near the middle (23). Thus, the United States is the only country in our sample that might be viewed as ranking low on uncertainty avoidance (11) and, according to Gray, the most likely of the countries we examine to be affected by individualism and masculinity values. The United States also has the highest individualism measure (50 out of 50) and a relatively high masculinity ranking (36 out of 50). Since these are asserted to have an inverse relationship with conservatism, we expect the United States to exhibit less conservatism than its uncertainty avoidance score alone would suggest.

Our analysis of Gray's (1998) model does not detract from our view that uncertainty avoidance will be the dominant factor in driving estimated warranty amounts. In addition to Gray, numerous other studies have established a link between uncertainty avoidance and differences in national accounting systems.⁸ Salter and Niswander (1995) test Gray's

⁸ Fechner and Kilgore (1994) note that Hofstede has acknowledged that uncertainty avoidance is significantly correlated with the other three cultural dimensions, thus it may mirror the entire set to a degree.

Table 1
Hofstede value indices by country related to Gray's conservatism accounting value and differences from France (rank out of 50 nations; 1 = lowest) [difference from France]

Values	Gray's conservatism ^a	France	Germany	United States
Individualism/Collectivism	–	71 (40–41) [N/A]	67 (36) [4]	91 (50) [–20]
Uncertainty avoidance	+	86 (36–41) [N/A]	65 (23) [21]	46 (11) [40]
Power distance	?	68 (37–38) [N/A]	35 (10–12) [33]	40 (16) [28]
Masculinity	–	43 (17–18) [N/A]	66 (41–42) [–23]	62 (36) [–19]

Sources: Gray (1988) and Perera (1989).

^a + Indicates a positive relationship between Gray's value and the measure of Hofstede's value index; – represents a negative relationship; ? indicates that Gray did not opt for a differential impact.

framework at the systems level and report that uncertainty avoidance is most closely related to Gray's model. Zarzeski (1996) reports that uncertainty avoidance is the most important of Hofstede's variables in explaining differences in disclosure practices. Similarly, Doupnik and Salter (1995) report that uncertainty avoidance is the foremost Hofstede characteristic in explaining the diversity among countries' accounting measurement and disclosure practices.

Table 1 indicates there are large differences in uncertainty avoidance among the three countries in our study. This high degree of variance should provide a fertile setting for testing the impact of uncertainty avoidance and its postulated accounting system characteristic, conservatism, on individual accounting judgments. The values of uncertainty avoidance presented in Table 1 lead to the expectation that French accountants will resolve estimates more conservatively than German accountants who in turn are expected to be more conservative than American accountants. We expect that American accountants will be even more liberal in their judgments due to the very high score on individualism and the relatively high score on masculinity (Gray, 1988). As suggested previously, the findings of Doupnik and Salter (1995) regarding code-based law and the varying reliance on equity financing may also have implications for our tests. Radebaugh and Gray (1997) cite France and Germany as their sole examples of countries with code-based and nonequity-financed systems and the United States as an example of a common-law-based country with predominantly equity financing.

Based on this discussion, we offer the following hypothesis (stated in the alternative form):

Hypothesis 1: Given the same case facts, individual American accountants will resolve warranty estimates at relatively lower dollar magnitudes than individual French and German accountants.

2.2. Cultural effect on decision-making under uncertainty

Kahneman and Tversky (1979) formulated prospect theory, which accounts for many of the anomalous findings from behavioral decision research. Prospect theory posits that decisions turn on the potential for either gain or loss represented by probable outcomes — not on the likely changes in total wealth. When individuals are faced with potential gain, they

tend to *underestimate* it relative to the expected value of the gain. When potential losses are considered, people tend to *overestimate* its actual expected value. Thus, when faced with the task of estimating warranty expense (loss), prospect theory holds that accountants will overestimate the expense.

Prior accounting research has found considerable support for the propositions of prospect theory (Chang, 1984; Chang & Schultz, 1990; Jackson & Jones, 1985; Rutledge & Harrell, 1993). Framing is often used to demonstrate this effect. Framing refers to the way a decision setting is presented to a decision-maker. For example, consider a decision about whether or not to use an experimental vaccine to counter the effects of a mortal disease. The positive frame will state that the use of an experimental vaccine may save 50 percent of the people. The negative frame will state that use of an experimental vaccine will result in 50 percent of the people dying. While both state the same probable outcome, research finds that subjects tend to resist using the vaccine (act more cautiously) when the outcome is framed negatively.

Although prospect theory is aimed at general behavior, Sharp and Salter (1997) posit that cultural values may interact with the effects of this theory. In their study of differences between Asian and Western cultures, they predict that the cultural attribute of uncertainty avoidance and negative (versus positive) framing will interact to accentuate the overweighting attributable merely to negative framing. They hypothesized that Asians (who are higher on uncertainty avoidance than Westerners) would opt for more investment than Westerners when the frame was negative. Sharp and Salter expected an observable outcome of the following pattern:

	Positive frame	Negative frame
Asian	More investment	<i>Much</i> more investment
Western	More investment	<i>Somewhat</i> more investment

They acknowledge that Chow, Harrison, Lindquist, and Wu (1996), in a study testing similar propositions, did *not* report an interactive effect. However, Chow et al. did report that their student sample from Taiwan committed a greater amount than their American student sample as predicted by cultural characteristics. Sharp and Salter's (1997) results are consistent with those of Chow et al. They observe differences between the cultures with Asians committing greater amounts than Westerners, but do *not* find significant differences attributable to the interaction.

We do not explicitly manipulate a framing treatment in this study primarily due to the number of subjects required and the limits on subject time (accessing highly experienced professional accountants is costly). For that same reason, we use a within-subject manipulation for both probability and monetary amount.⁹ We do, however, approximate a negative

⁹ Monetary amount and probability level were manipulated in our experiment to study other potential behavioral effects on judging estimated amounts (see Einhorn & Hogarth, 1985; Hogarth & Einhorn, 1989). These variables had no significant results in our models and are not discussed further.

frame in our low- and high-monetary amount manipulation. That is, when the lower (higher) monetary amount is followed (preceded) by the higher (lower) monetary amount, the higher (lower) amount is likely to be perceived as more (less) serious. Thus, when it appears that the loss is becoming greater (smaller), the participants are expected to perceive it as a negative (positive) frame. Based on the theoretical development of Sharp and Salter (1997) discussed above, we offer the following hypothesis (stated in the alternative form):

Hypothesis 2: The warranty estimates of participants that were given a low to high order of monetary amounts will be greater for French than German accountants and greater for German than American accountants.

3. Research methodology

This section reviews the procedure, the participants, the instrument, and the variables involved in the study.

3.1. Procedure

The experimental instruments were administered in a single practice office of the same large international accounting firm in each of the three countries. Participants in the three countries were native to their respective countries and obtained nearly all their experience there. Each participant completed two cases involving a warranty expense scenario. One case involved a high monetary amount, while the other involved a low amount (see Appendix A). For each case, three probabilities with varying degrees of ambiguity were presented. The participants were asked to follow their “normal guidelines” to assess the warranty expense that should be recognized for two cases. Accounting rules governing such estimates are similar in each of the three countries.¹⁰

Instruments were in the language common to the participants’ offices. Initially, the English cases were constructed and reviewed by two partners in the participating firm. Following modification, individuals familiar with business terminology, English, and local languages translated the instruments into French and German. Partners in the French and German offices reviewed these versions, which led to the final instruments.

3.2. Participants

In order to assure that the participants had the requisite experience to provide competent and reliable judgments, we used public accountants with an average of nearly

¹⁰ See the discussion in footnote 2 above. Additionally, Radebaugh and Gray (1997, Chapter 14) discuss major differences among various national accounting systems. They do not include accounting estimates as a difference. Also, Coopers and Lybrand (1991), which discusses various national accounting systems, does not draw significant differences among the three countries in this study in this area.

10 years experience as auditors. Each country (office) supplied 16 participants for a total of 48. All of the participants were either a manager or partner with the exception of one senior staff participant in the US office. The average ages of the French, German, and American participants were 33, 38, and 30 years old, respectively. The average experience in public accounting of the French, German, and American participants was 9, 11, and 7 years, respectively.

3.3. Case construction

The objectives we sought to achieve in the construction of the experimental cases were to make the two firms quite similar and to make each of them have a low-risk profile. Each case involved similarly sized manufacturing companies that were involved in the distribution of athletic equipment or outdoor furniture (see Appendix A). Both cases involved new products that were believed to possess superior attributes to its competitors. In each case, the product's unique attribute proved faulty at a rate higher than expected.

Characteristics that might influence the perceived risk of each firm were stabilized at a low level. This is important because Wingate (1997) reports that the United States has a higher litigation index than France and Germany (higher index is associated with greater litigation risk). If auditors are concerned about litigation risk, then it would likely tend to work against our hypothesis that French and German accountants would be more conservative in their warranty estimations than American accountants. To address this issue, we imbued each firm with good management, sound financial condition, and stable performance over time. To further avoid extraneous accounting and auditing concerns, we indicated that all estimated amounts were material and that evidence related to the estimate was reliable and objective. Finally, we addressed potential problems associated with anchoring by avoiding the mention of book values for the estimates.

3.4. Variables

The experimental design involved French, German, and American accountants making judgments at three levels of probability and two monetary amounts. The probability levels and the monetary amounts were within subjects' variables, primarily due to scarcity of participants and because the task involved ordinary repetitive judgments not uncommon to their practice environment (Pany & Reckers, 1987). The repeated measures necessitated the use of two separate cases, which were administered in balanced order.

3.4.1. Ambiguous probability levels

The three probability levels chosen for testing were .06 (low), .25 (medium), and .75 (high). To establish ambiguity, each case scenario included two task forces consisting of an "inside" and "outside" expert. The teams were constructed to lend reliability to the estimates and to highlight the ambiguity inherent in trying to make a point estimate of the proportion of new product that would be returned (Hirst, 1994). To provide a realistic setting within the case, each team provided an explanation for the product deterioration (see Appendix A).

Each team arrived at a common point in their estimated range of the proportion of product to be returned. For example, for the medium probability treatment level of .25, one team reached a range of 18–25 percent estimated return rate and the other a range of 25–32 percent. The common point being 25 percent. The range estimates for the low probability teams were 2–6 percent and 6–10 percent, while the high probability ranges were 65–75 percent and 75–85 percent. Consequently, the intended manipulations of 6, 25, and 75 percent were always included in both “expert” teams. The different ranges between teams provided a potential justification for those participants wishing to under- or overweight the probability present in a specific judgment.

3.4.2. Monetary amount

Each set of cases involved a large monetary amount (US\$2,500,000 or equivalent in FF or DM) or a small monetary amount (US\$50,000 or equivalent in FF or DM). All amounts were explicitly stated to be material.

Participants were provided adequate information to perform all calculations. Each expert team reported the same estimated per unit cost of satisfying the warranty (US\$50 or equivalent in FF or DM). To effect the manipulation, the unit sales data in the cases were either 1000 or 50,000 units. This stabilized the monetary exposure so that no ambiguity beyond that induced by the probability ranges would be present.

3.5. Dependent variable

For each combination of probability level and monetary amount, the participants calculated and reported the amount of warranty expense they would recognize. This resulted in each participant making six judgments over two cases. Warranty expense was chosen for four reasons. First, it is familiar to all accountants in the study. Second, the accounting guidelines in the three countries require that warranty expense be recognized, but leave a relatively wide range of discretion common to other accounting estimates. Third, it is commonly used in testing varying probabilities and ambiguities in behavioral decision-making (e.g., Hogarth & Einhorn, 1989). Lastly, it has been used in previous accounting studies (Main, 1994; Schultz & Cordery, 1992).

4. Empirical results

To analyze the data, raw responses were transformed to deflate the effects of different probability levels, ambiguity ranges, and monetary amounts. Transformation was necessary to prevent an effect due simply to differences in these amounts. For example, if participants indicated that US\$15,000 should be recorded for the combination of .25 probability at the low amount (US\$50,000) and that US\$750,000 should be reported for the high amount (US\$2,500,000), then differences are apparent but unrelated to the theory being tested. However, when the two amounts are scaled by their expected values, there is no difference. At .25 probability, the expected value of the low amount is US\$12,500 ($\text{US\$50,000} \times .25$)

and the scaled amount is 1.20 (US\$15,000/US\$12,500). For the large amount, the expected value is US\$625,000 ($.25 \times \text{US}\$2,500,000$) and the scaled amount is also 1.20 (US\$750,000/US\$625,000). A larger (smaller) scaled value indicates a more (less) cautious reaction to the ambiguous probability level, the size of the potential warranty loss, or the national forces. Using a proportionality transformation is also consistent with the language used in the experimental hypotheses.

Since the ambiguity ranges around the three probability levels varied in relative terms, a further transformation was also employed. For example, the 2–10 percent range around the low probability of 6 percent allows for a variation in expected values of up to 67 percent (i.e., $10 - 6 = 4$ and $4/6 = 0.67$). On the other hand, the high range of 65–85 percent around the high probability of 75 percent provides for a potential variation of only 13 percent in the expected value (i.e., $85 - 75 = 10$ and $10/75 = 0.13$). Thus, an ordinal scale was developed as follows: 1 = an adjusted amount less than expected value (EV); 2 = EV; 3 = an adjusted amount between EV and the top of the range; 4 = an adjusted amount at the top of the adjusted range; and 5 = an adjusted amount greater than the top of the range.

The ordinal nature of the dependent variable dictates that a nonparametric method be used for the empirical analyses. In this case, the most powerful model available is CATMOD (SAS, 1992). This method, while statistically appropriate, does not provide the same power afforded by parametric methods, such as ANOVA, MANOVA, or ANCOVA, which rely on intervally scaled dependent measures. The ensuing analysis limited the number of variables, measures, and interactions that could be included in any one model. Consequently, no formal tables related to Hypothesis 1 are included. The various models did *not* affect the findings of significance or insignificance. That is, all the models estimated had consistent results.¹¹

4.1. Test of Hypothesis 1

Hypothesis 1 predicts that US accountants will recommend recording estimates that are lower (less cautious) than their European counterparts. The results support acceptance of the hypothesis. The mean standardized warranty estimates are 2.875, 2.650, and 2.260 for French, German, and American accountants, respectively. The estimates made by American accountants are significantly less than both German and French accountants ($P < .01$); however, the estimates made by the German and French accountants are not significantly different.¹²

The mean values merit interpretation. An ordinal value of 2.0 would indicate that the accountants were risk neutral and merely accrued the expected value of the estimate.¹³ On the other hand, a value of 3.0 would indicate that the participant estimated warranty expense somewhere between the expected value and the maximum write-off suggested by the expert teams. Thus, the 2.875 French mean places the typical French accountant well above the expected value across all levels of probability and monetary amounts. Detailed

¹¹ Representative statistical model results are available from the authors.

¹² Based on Bonferroni tests of differences between means.

¹³ The ordinal values refer to the ordinal scale transformations we discuss in Empirical Results.

analysis of the data indicated that the French were indeed more cautious than those from other nations. In fact, two French accountants opted to write off the cost of having the entire product-line sales returned.

4.2. Test of Hypothesis 2

Hypothesis 2 predicts that for participants given a low to high monetary amount order, the estimates of warranty expense will be greatest for French accountants, with German and American accountants following in that order. Hypothesis 2 tests whether monetary order (our proxy for framing) interacts with nationality in such a way that the participants from nations higher on uncertainty avoidance (e.g., France) would react differentially to order than those from nations lower on uncertainty avoidance (e.g., Americans). The negative framing (low to high monetary amount) was expected to result in larger, more conservative warranty accruals than the positive framing (high–low monetary amount) as the level of national uncertainty avoidance increased.

To detect if order simulated negative and positive frames, we tested the main effect of monetary order. It proved significant in the correct direction to support the framing notion from prospect theory ($P < .01$; means: low to high, 2.791; high to low, 2.395). The interaction with country, which specifically addressed Hypothesis 2, also proved to be significant ($P < .01$). The results of the test of Hypothesis 2 are reported in Table 2 and reflect the expected directional movement.

The mean differences by country between the negative and positive frames are reported in Table 2 (right column). The French, who have the greatest aversion to uncertainty (86, see

Table 2
Mean warranty estimates by monetary order by country^a

	Low to high mean (negative frame)	High to low mean (positive frame)	Within-country difference
France	3.333	2.416	0.917*
Germany	2.875	2.416	0.459**
Difference	0.458 (2.41) ^b [.1207] ^c	0.000 (0.00) [1.000]	
France	3.333	2.416	0.917*
United states	2.166	2.354	–0.188
Difference	1.167 (14.09) [.0002]	0.062 (0.11) [.7383]	
Germany	2.875	2.416	0.459**
United states	2.166	2.354	–0.188
Difference	0.709 (5.77) [.0163]	0.062 (0.10) [.7553]	

^a The significance of the interaction between monetary order and country based on the F test being significant at $P < .0001$.

^b Chi-square statistics.

^c P values.

* Significant at $P < .01$ based on Bonferroni tests of differences between means.

** Significant at $P < .05$ based on Bonferroni tests of differences between means.

Table 1), have a significant mean shift of 0.917 ($P < .01$) between the positive and negative frames. Thus, as they move from a positive to negative frame, they opt to accrue significantly more warranty expense. The Germans, who have a moderate aversion to uncertainty (65, Table 1), also have a significant mean shift of 0.459 ($P < .05$) between the positive and negative frames. While still significant and in the expected direction, the magnitude of the shift is not as great as the French. The Americans, on the other hand, exhibit an insignificant mean shift of -0.188 between the two frames. Thus, Americans, who have a relatively low level of uncertainty avoidance (46, Table 1), show a shift that is not only a lower magnitude than the French and Germans, but also in a different direction (albeit not significant). Thus, our results support acceptance of the hypothesis and also the proposition advocated by Sharp and Salter (1997).

5. Summary and conclusion

Considerable research has demonstrated that national accounting systems result in significant reporting differences among publicly traded companies (Gernon & Wallace, 1995; Pownall & Schipper, 1999; Prather & Rueschhoff, 1996; Saudagaran & Meek, 1997). The IASC has recently completed a set of uniform standards that are intended to overcome these differences for companies domiciled in various countries. Some observers (e.g., Tay & Parker, 1990; van der Tas, 1988; Van Hulle, 1997), however, contend that *de jure* consistency will not necessarily result in *de facto* consistency in the application of these standards across countries. Consistency in application among nations is a key acceptance criterion of the US SEC (Pownall & Schipper, 1999). Our results suggest that uniform international accounting standards may not result in *de facto* uniformity among nations, particularly when the standards allow for significant discretion (ambiguity).

Our results also support the notion advanced by Sharp and Salter (1997) that national cultural characteristics may interact with behavioral propositions. Findings show that experienced accountants from countries high on uncertainty avoidance are more sensitive to framing effects than accountants from low-uncertainty avoidance countries. Considering estimates in a negative setting versus a positive setting resulted in disproportionate differences for accountants from high-uncertainty avoidance countries as compared to accountants from low-uncertainty avoidance countries. This indicates that the phrasing of international accounting standards or the way that accountants interpret those standards may play an unintended role in accounting measurement across nations (Kinney & Uecker, 1982).

The sample countries in the study had intense and subtle differences in the relevant theoretical dimensions. For example, Radebaugh and Gray (1997) use all three as representative of countries with different legal systems and sources of financing. They note that France and Germany's history with Roman code-based law had an important effect on today's environment. Douppnik and Salter's (1995) cluster analysis place the United States at the extreme of their micro-based system category and Germany next to the extreme of their macro-based category. France is also well ensconced in the macro-

category. These strong and intense differences resonate with the guidance offered by Harrison and McKinnon (1999) who argue that intensity is often missing or inadequately considered in international studies. Expanding the analysis beyond mere culture to environmental factors addresses another of their major concerns; namely, that cultural differences often serve as too simplistic a tool for differentiating sample countries in international studies.

Appendix A¹⁴

NUMBER: _____

Instructions

The following set of materials is designed to learn more about how accounting judgments are made and the factors that contribute to differences in those judgments. The accounting judgments in this study concern warranty expenses and their corresponding liabilities. As you know, there is no one, precisely correct amount to be reported in the company's financial statements. Some accounting guidelines and specific cases are included in these materials. In addition, some of the materials ask for your feelings on general issues.

There are three sections in the study. Some suggested time limits are provided at the outset of each section in order to have everyone finish that portion of the study at about the same time. The whole study should take about 1 hour.

Your conscientious effort is *essential* to the validity of this study. Please follow the instructions carefully and respond to the best of your ability. Your responses will be confidential. The above number is for coordination purposes. *Please record it* for later use.

For each accounting judgment task that follows, your audit client has asked you, as the external auditor, to provide a judgment on the amount of warranty expense that should be reported. Members of the client's staff are also working on this amount. Because the pertinent information has only recently become available, they have not reached a conclusion.

Consider the amounts in each case *material*. From the standpoint of materiality, the amounts constitute a significant though not dominant percentage of the relevant financial statement bases.

This study involves two companies. Neither is in danger of going-concern problems (i.e., they do not have any significant prospect of bankruptcy). Both companies are approximately the same size and have securities that are traded on several national security markets. Their risk profiles are similar.

Follow your normal guidelines for reporting your judgments in the following warranty expense cases. Essentially these guidelines require reporting an estimated expense and liability in the same accounting period that the related revenue is reported. There will be

¹⁴ The spacing on the actual questionnaire was more generous; it is compacted here to conserve space.

amounts reported in the financial statements for the revenues from the sale of the product and for the warranty. Some amount of related expense and liability should be reported.

Judgments relating to the first company should take you about 10 minutes. Judgments for the second company should take slightly less time.

The Birch Company

The Birch Company manufactures and distributes patio furniture to independent retailers as well as regional chain stores. Its customers have a long, sound record of success. There is no reason to suspect that this will change in the foreseeable future. Birch's performance is regarded as reliable and consistent. Over the past 35 years, its record of on-time delivery of a quality product has proved excellent.

Late in its fiscal year, Birch introduced a new line consisting of furniture sets with two adjustable loungers and a small table. A unique aspect of this line is the fiber's ability to withstand the most severe weather elements. Recently, however, a problem has developed that has resulted in a return rate higher than expected. The principal problem has been with deterioration of the fiber.

Upper management, which has established a good performance record, wants to secure a detailed analysis of this matter for future decision-making as well as for assessing the amount of warranty expense that should be recognized in the financial records. Sales data show that 50,000 of the sets were sold in the past year.

Management has asked you, the external auditor, to review the new product data to assist them in arriving at the pertinent information. Management has established two teams, each composed of an outside expert and one insider who is familiar with the production process and the nature of the problem. Each of the two-person teams has proceeded independently of the other. Your inquiry has led you to conclude that each team is reliable and objective. A portion of each report appears below.

Task Force 1 Report: Concern for abnormal replacement expenditures associated with the L476 lounge set is clearly justified. Based on the rigorous procedures described earlier, the cause of the problem is the unanticipated reaction between chemicals found in certain yard-care products and the fiber. Some uncertainty remains regarding the proportion that will be returned. We believe that this figure will fall between 25 and 32 percent. Of those returned, replacement will cost US\$50. We are highly confident in the precision of this cost.

Task Force 2 Report: Based on the comprehensive testing as detailed above, we are convinced that the unexpected chemical reaction led to the failure of the fibers in the L476 lounge set. This results in substantially higher failures than other models in this line. We conclude that the cost of each replacement will be US\$50. We have great confidence in this amount. The rate of product return, however, is more difficult to estimate. Our analysis indicates that the return rate will be in the 18–25 percent range.

What amount do you recommend to be recorded for warranty expense? _____

IT IS CRUCIAL THAT YOU SHOW YOUR COMPUTATIONS UNDERLYING THIS AMOUNT. (SPACE PROVIDED IN ACTUAL INSTRUMENT)

Assume that the facts were the same as above but that the first report indicated return percentages approximately in the 65–75 percent range and the second in the 75–85 percent area. What amount would you recommend in this case? _____

AGAIN, IT IS *CRUCIAL* THAT YOU SHOW YOUR COMPUTATIONS. (SPACE PROVIDED IN ACTUAL INSTRUMENT)

Finally, assume the same facts except that the return percentages were estimated in the first report in the 2–6 percent area and in the second in the 6–10 percent range. What amount would you recommend in this case? _____

AGAIN, *SHOW* YOUR COMPUTATIONS. (SPACE PROVIDED IN ACTUAL INSTRUMENT)

The Maple Company

The Maple Company manufactures and wholesales a complete line of athletic shoes and clothing. The company has existed for four decades and has built a solid reputation as a provider of quality products. It is managed by well-trained, competent professionals. Maple's financial performance has been sound and no significant change is expected.

To recognize trends in consumer tastes, the company periodically introduces new products. One of these new products, an athletic shoe (known as the "float"), has been returned at a higher rate than normal.

To address the unusual return rate, management set up two teams. Management expects this to result in highly reliable information both for future lines and for recording the warranty expense related to the 1000 units sold this year. To provide for added independence, each team was structured to have one outside, objective expert and one competent employee familiar with the appropriate matters. The part of each report relevant to the warranty matter appears below.

Management has asked you, the external auditor, to review the reports of the two teams and arrive at a judgment regarding the amount of warranty expense to be recorded for this one line. Each team worked separately. Your inquiry has led you to conclude that each team is reliable and objective.

Team 1 Report: The Float line's air bubble deterioration is traceable to the unexpected acidity levels that result from combination of the glue fastener and human perspiration. Users who perspire heavily and possess certain pH levels of acidity in their perspiration are likely to have accelerated wear problems. Based on a survey article in *Medicine and Athletics*, a highly regarded medical journal, and on a user study by our marketing research department (see Report 90-14), we conclude that 18–25 percent of the line will be returned. This estimate is somewhat subjective. However, we are confident that the cost per pair of shoes returned will be US\$50.

Team 2 Report: Conclusions about Float are of mixed reliability. We conclude with confidence that the cause of the air bubble collapse is the reaction between the perspiration acidity referred to earlier and the glue compound. Also, we are confident that the cost of

replacing each pair of shoes will be US\$50. The failure rate is more subjective, however. Our best estimate on the rate of return, after referring to available scientific evidence and Report 90-14, is that it will range from 25 to 32 percent.

What amount do you recommend be recorded for warranty expense? _____

IT IS *CRUCIAL* THAT YOU SHOW YOUR COMPUTATIONS UNDERLYING THIS AMOUNT. (AS ABOVE, SPACE PROVIDED)

Assume that the facts were the same as above but that Team 1's report indicated return percentages as 6–10 and Team 2's report reflected the percentages to be in the 2–6 range. What amount would you recommend in this case? _____

AGAIN, IT IS *CRUCIAL* THAT YOU SHOW YOUR COMPUTATIONS.

Finally, assume the same facts as above except that the replacement percentage in the first report was 65–75 percent and in the second report was in the 75–85 percent range. What amount would you recommend in this case? _____

AGAIN, IT IS *NECESSARY* TO SHOW YOUR COMPUTATIONS.

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Pergamon

The International Journal of Accounting
36 (2001) 291–309

The
International
Journal of
Accounting

Cross-cultural differences in the behavioral consequences of imposing performance evaluation and reward systems: An experimental investigation

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Abstract

This study explores the effects of national culture differences on the behavioral consequences of imposing performance evaluation and reward systems (PERS). It postulates that two cultural dimensions — individualism/collectivism and power distance — can modify employees' decisions under, as well as satisfaction with, imposed performance evaluation and rewards aimed at modifying their work-related behavior. In a laboratory experiment that focused on a teamwork setting, these cultural attributes were operationalized via a comparison of US vs. Chinese nationals in Taiwan (CNT). On the whole, the results were consistent with US nationals significantly changing the team orientation of their decisions in response to imposed performance measures and rewards, but a similar impact was not found for the CNT subjects. And, consistent with culture-based predictions, US nationals had significantly lower satisfaction under imposed, rather than self-selected, performance evaluation and reward structures, while their CNT counterparts did not have a similar adverse reaction. These results are consistent with prior Anglo-American-based research that the PERS significantly affects employee behavior. But they also suggest that this finding may not be directly generalizable to employees whose national cultures differ from those of Anglo-Americans. © 2001 University of Illinois. All rights reserved.

Keywords: Performance evaluation and rewards; National culture; Cross-cultural comparison; Employee decisions; Teamwork; Self vs. collective interest conflicts

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1. Introduction and overview

A central concern of organizations is ensuring that employees' decisions and actions are aligned with their best interests (Merchant, 1985, 1989). A large body of research, primarily conducted in Anglo-American contexts, has shown that the performance evaluation and reward system (PERS) can significantly influence employee behavior (Young & Lewis, 1995; Young & Selto, 1993). This finding is taken to imply by both theorists and practitioners that organizations can use the PERS to ensure or increase the congruence between employee behavior and their own objectives (Merchant, 1989, 1998).

Yet a question that arises in the current era of global markets is whether this implication will hold across national boundaries. A growing body of research has consistently observed that national culture affects employees' work behavior (see Erez & Earley, 1993; Harrison & McKinnon, 1999; Hofstede, 1991; Trompenaars & Hampden-Turner, 1998). More specifically, it has been observed that similar controls have different effects on the work behavior of people from different cultural backgrounds (Birnberg & Snodgrass, 1988; Chow, Kato, & Merchant, 1996; Chow, Shields, & Chan, 1991; Daley, Jiambalvo, Sundem, & Kondo, 1985; Harrison, 1992, 1993). The potential implication of these findings is that the effectiveness and effects of PERS may differ across nations, with attendant implications for global firms' design of management systems and processes.

The objective of this study is to explore the effects of national culture differences on the behavioral consequences of PERS. In a laboratory experiment involving a teamwork setting, national culture dimensions hypothesized to be relevant to this phenomenon were operationalized via a comparison of US vs. Chinese nationals in Taiwan (CNT). We found that among CNT subjects, imposing PERS, which differs from individuals' self-selected ones, only minimally affected the team vs. individual orientation of their decisions. In contrast, and consistent with prior Anglo-American-based studies on the effects of compensation contracts, there generally was a significant effect on US subjects' decisions. And, as expected based on the cultural dimensions of individualism and power distance, US nationals who worked under imposed performance-based pay structures were significantly less satisfied than their compatriots working under pay structures that they had self-selected. Also consistent with culture-based predictions, a similar difference in satisfaction was not found among the CNT subjects. These results caution against a direct extrapolation of research results and practices relating to PERS across nations with significantly different cultures. They also may imply that the effect of PERS on employee behavior and reactions may be less powerful than is generally conceived.

The remainder of this paper is organized as follows. Section 2 reviews related prior literature on national culture, teamwork, PERS, and job satisfaction. Then we describe the empirical method, analysis, and results for the experiment. Section 4 discusses the limitations of this study and offers suggestions for future research.

2. Literature review and hypothesis development

This section is divided into three parts. The first part discusses why this study selects teamwork as the focus, and the relation of teamwork to the individualism dimension of national culture. The second part discusses how PERS may affect employee behavior and reactions in teamwork situations. The final part addresses how individualism and another dimension of national culture — power distance — may moderate the effects of imposed PERS on employee job satisfaction.

2.1. *Teamwork and individualism*

Teamwork and related management approaches (e.g., total quality management, just-in-time) have been given major credit for the Japanese firms' success as global competitors (Hay, 1988; Schonberger, 1982), and Western firms increasingly are adopting team-based work arrangement (Dertouzos, Lester, & Solow, 1989; Dumaine, 1994).

To be effective, teamwork requires cooperation and sharing among individual employees. Consequently, employees' relative emphasis on self-interests vs. those of the collective can significantly affect the success of teamwork initiatives. This work-related value has been labeled individualism (or conversely, collectivism), and has been reported to differ systematically across nations (Hofstede, 1980, 1991; Ronen & Shenkar, 1985). In one operationalization of this construct, Hofstede (1980, 1991) has reported that workers from Japan and the US have scores of 46 and 91, respectively, on his scale for measuring individualism. Consistent with Hofstede's results, other students of US culture have isolated individualism and the self-interest motive as being central to US management theories and practices (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1987; Harris & Moran, 1987; Locke & Latham, 1984; Spence, 1985; Triandis, Bontempo, Villareal, Asai, & Lucca, 1988). On the other hand, students of Japanese culture have stressed its emphasis on subjugating self-interests to those of the collective (Befu, 1980; Kamata, 1982; Ouchi, 1981; Smith, 1983; Yang, 1984).

Japanese and US cultural differences have been cited as possible explanations for many US firms' failed attempts to implement Japanese management practices (Fucini & Fucini, 1990; Young, 1992). In the case of teamwork, its demand for subjugating one's self-interests to those of the team may hinder firms that are from an individualistic culture, such as the US, from realizing the full potential of this work arrangement (Awasthi, Chow, & Wu, 1998; Business Week, 1992; Chow, Kato, & Shields, 1994; Chow et al., 1991; Dumaine, 1991, 1994; Lincoln & Kalleberg, 1990; Snell & Dean, 1992; Young, 1992; Zipkin, 1991). Specifically, relative to their counterparts from a collective culture, employees from an individualistic culture may be less inclined to make self vs. team tradeoffs in favor of team.

From the perspective of global management, an important question that arises is whether the behavioral implications of employees' national culture — such as those relating to teamwork — have to be accepted as absolutes, or can be counteracted by feasible management actions. In this regard, a substantial body of research has found that employees'

behavior depends significantly on how their performance is evaluated and rewarded (Young & Lewis, 1995; Young & Selto, 1993). This finding has been taken by both theorists and practitioners to imply that it is possible for a firm to influence how employees behave through its PERS (e.g., Kandel & Lazear, 1992; Weitzman & Kruse, 1990).

In the specific case of teamwork, the preceding finding suggests that a firm may be able to shift employees' relative emphases on self vs. team performance by changing the weights placed on these aspects of performance. Testing this possibility is one aim of this study. A related, and more general, question is the relative impacts of PERS vs. national culture on employee behavior. Because extant theory and empirical results on the effects of PERS are primarily from individualistic Anglo-American settings, this question is left unanswered. To focus the empirical tests on these two issues, we postulate the following:

Hypothesis 1: Individuals' tradeoffs between self and team performance can be modified by an imposed performance evaluation and reward system.

Our study uses CNT subjects to represent a collective culture, and US nationals to proxy for an individualistic culture. The use of CNT, rather than Japanese, subjects (despite the literature's relative emphasis on Japanese management practices) is due to our lack of access to the latter. However, this "substitution" is unlikely to be a problem because the study's focus is on the theoretical implication of the individualism–collectivism cultural dimension, rather than Japanese culture or Japanese practices per se. As in the case of the Japanese, an emphasis on collective interests also has been identified as being a central Chinese cultural value (Chinese Cultural Connection, 1987; Hofstede, 1980, 1991; Hui & Triandis, 1985; Leung & Bond, 1984). Indeed, Hofstede (1980, 1991) has reported an individualism score of 17 for the CNT, thus suggesting that they would permit effective operationalization of the individualism cultural dimension.

2.2. *Job satisfaction effects of PERS*

Beyond being concerned with employees' job-related decisions and actions, organizations also are interested in other aspects of employees' reactions to their PERS. One such aspect that has received much attention is employee job satisfaction, which has been defined as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experience" (Locke, 1976). Job satisfaction is based on several job-related features including the pay and reward structure (Lincoln, 1989; Smith, Kendall, & Hulin, 1969), and has been associated with absenteeism, turnover, and other employee problems (Muchinsky, 1990; Saal & Knight, 1982; Schneider, 1985). As such, employee job satisfaction can significantly affect a firm's long-term performance and costs (Bimberg, Turopolec, & Young, 1983; Hopwood, 1972; Weick, 1983).

Since an imposed PERS is unlikely to exactly match employees' personal preferences, it can be expected to decrease the latter's job satisfaction even if it does induce the desired actions (increased emphasis on collective performance in a teamwork setting). While we expect this tension to exist in all cultures, we expect the degree of dissatisfaction with an

imposed PERS to vary with two specific national culture dimensions: individualism and power distance.

Employees from an individualistic culture are expected to be more dissatisfied with an imposed PERS, as one attribute of such a culture is an emphasis on individual preferences and freedom of action (Erez & Earley, 1993; Triandis et al., 1988). “In an individualistic culture, emphasis is placed on self-sufficiency and control in the pursuit of individual goals, which may or may not be consistent with in-group goals” (Erez & Earley, 1993, p. 79). Thus, individualists can be expected to prefer selecting PERS themselves, and thus will be less satisfied with an imposed, rather than self-selected, PERS. In contrast, people from a collective culture do not have as strong a preference for individual control and choice, such that the difference in their satisfaction between self-selected and imposed PERS should be smaller than for individuals from an individualistic culture.

To the extent that the imposition of a PERS is involved, the power distance aspect of national culture also is expected to be operant. This cultural dimension has been defined as the degree to which people accept interpersonal inequality in power and the institutionalization of such inequality (Hofstede, 1980, 1991). Relative to individuals from a low power distance culture, those from a high power distance culture tend to accept more readily the decisions and demands made by their superiors.

In comparing Chinese and US nationals, we see that the former have been identified as being among the highest in power distance, whereas the latter have been classified as being low on this dimension (Chinese Cultural Connection, 1987; Hofstede, 1980, 1991). Numerically, Hofstede (1991) has reported power distance scores of 58 for the CNT vs. 40 for US nationals. Thus, relative to their CNT counterparts, US nationals are both higher in individualism and lower in power distance. This combination implies that relative to the CNT, US nationals would have a greater preference for pursuing individual goals, free of interference from superiors.

The preceding discussion provides the basis for the following hypothesis:

Hypothesis 2: Individuals working under imposed PERS are less satisfied with such systems than those working under self-selected systems. This difference is greater for US nationals than for their Chinese counterparts.

3. Method

3.1. Subjects

The subjects were 150 business students from MBA and senior level undergraduate classes. Half was from the US and half from Taiwan. All were volunteers who were told that they would be paid cash based on their performance in the experiment, but not the nature or objective of the exercise. All US subjects were Caucasians, and all Taiwanese subjects were of Chinese ethnicity and spoke Chinese as their primary language. Prior to the experiment,

the subjects were asked to form three-person teams based on how much they liked working with each other. This was done because prior research has shown that collectivism is most manifest in dealing with individuals considered to be in one's own "in-group" (Bond, 1991; Earley, 1993; Triandis, 1989).²

3.2. Task

The experiment was conducted in two parts about 1 week apart. The US subjects were paid a flat fee of US\$10 to participate in Part I. The Taiwanese subjects were paid New Taiwanese (NT) \$100, which was equivalent to US\$10 after adjusting for differences in starting salaries and the prevailing currency exchange rate.³

In both parts of the experiment, subjects assumed the roles of product design engineers.⁴ Each subject was told that he/she and his/her two teammates were a stable team responsible for the timely design of new products. All new products had potential total sales revenue of US\$900,000 and required three design stages: A, B, and C. Each design stage required 2 months, and assignment of design engineers to stages was random. Given that each design stage took 2 months, every design team worked together on six new products per year and, on average, each design engineer worked on design Stages A, B, and C of two of these products.

The company was described as computing two performance measures for each new product that was designed. First was an individual performance measure for each design engineer. This measure was obtained by assigning to each of the three design stages one third of the product's potential sales revenue ($1/3 \text{ US\$}900,000 = \text{US\$}300,000$), then deducting the design engineer's actual design resource expenditure for his/her stage. The second measure was team performance, which was the sum of the three design engineers' individual performance measures.

3.2.1. Part I

Each subject first answered four questions relating to individualism–collectivism (Hofstede, 1980). Then he/she was asked to select a performance-based pay structure (i.e., relative

² We acknowledge that our process of forming teams may not have created strong in-group feelings or identity. If so, this would have weakened our ability to detect the effects of collectivism. However, Earley (1993, p. 321) has suggested that an in-group is no more than "an aggregate of people sharing similar traits, and background characteristics. In-group members may identify one another via common interests, values and beliefs, or heritage (Hackman, 1976; Pfeffer, 1983; Triandis, 1988). This definition does not (even) require that in-group members have direct contact with one another while working or that they work interdependently.

³ The ratio of US to Taiwanese subjects' cash pay was based on the assumption that beginning salary for the US subjects is US\$40,000, while that for the Taiwanese subjects is US\$16,000. Applying the prevailing exchange rate of US\$1 = NT\$25 at the time of the experiment, $\text{US\$}10 \times (\text{US\$}16,000/\text{US\$}40,000) \times \text{NT\$}25 = \text{NT\$}100$. The same approach was used to convert the dollar amounts in the US instrument into NT dollars, such that the magnitude of the latter was 10 times that of the amounts in US dollars: $\text{US\$}1 \times (\text{US\$}16,000/\text{US\$}40,000) \times \text{NT\$}25 = \text{NT\$}10$.

⁴ The Taiwanese instrument was administered in Chinese. First, a person not associated with the experiment translated the English version into Chinese. Then a bilingual member of the research team edited it for equivalence with the English original.

proportions of individual and team performance) as the basis for how he/she and his/her teammates would be paid for all products that their team designed. They were told that for each product, each design engineer would be paid 10% of his/her chosen weighted average of individual and team performance measures.

All subjects chose from among the same 11 pay structures, ranging from 0% team-based to 100% team-based in increments of 10% team-based pay (e.g., 100% team-based/0% individual-based; 90% team-based/10% individual-based, etc.). Before making their choice, the subjects worked through four detailed numerical examples. These examples involved different mixes of actual resource expenditures in one design stage (some above and some below original budget) and their impacts on subsequent stages' resource requirements. For each mix, the subjects calculated each design engineer's pay under five pay structures that spanned the continuum. They were given the correct computations and numerical answers after completing each example.⁵

After choosing their pay structures, the subjects answered demographic and manipulation check questions. The latter included a question on the perceived level of interdependence among the team members. Then they were paid and dismissed.

3.2.2. *Assignment to self-selected and imposed pay structures*

In the interim, the subjects from each country were split into two subsets as follows. The first subset consisted of 31 Taiwanese subjects matched with 31 US subjects. These 31 pairs (labeled the SELF-SELECT group) were assigned to their self-selected pay structures in Part II of the experiment.⁶

The second subset contained the remaining (unmatched) subjects from each country, who were systematically assigned to pay structures that differed from those they had self-selected. Within each national sample, these subjects were further subdivided into two groups: one group with constant departures, and one group with increasing departures from their self-selected pay structures. The numbers and distribution of subjects

⁵ Part I of the experiment had two levels of task interdependence to ensure salience of this teamwork attribute. Eighteen subjects from each national sample made the pay structure choice under a low-task interdependence (Low I) condition. The remainder did so under a high-task interdependence (High I) condition. Task interdependence was operationalized as follows. The experimental scenario stated that after 1 month of each design stage, the engineer who had been randomly assigned to that stage would obtain private information about a range of resource expenditure options for the remaining month. The engineer's choice of expenditure level from among these options would directly affect the monthly resource requirements for the subsequent design stages. All of the Month 2 choices entailed a self vs. team tradeoff in that a higher (lower) expenditure for this month (which directly affected the engineer's individual performance measure) typically would induce a more than offsetting reduction (increase) in the subsequent stages' total resource requirements. For the US subjects under High I (Low I), a US\$5000 higher (lower) expenditure in Month 2 of Stage A typically would decrease (increase) *monthly* resource requirements by US\$5000 (US\$1500) for Stages B and C. The Taiwanese experimental materials were expressed in NT dollars. Their numerical values were 10 times those of the US version.

⁶ Only a subset of the Part II data from these subjects was used in this study. The remainder was used for a separate study (Awasthi et al., 1998).

obtained in Part I dictated the numbers and directions of these assignments within each national sample.

Within the Taiwanese sample, 21 subjects were in group ASSIGNED-1. These subjects had self-selected Pay Structures 3, 4, 6, and 7 and each was assigned to a pay structure which differed by four categories from their self-selected structures, i.e., to Categories 7, 8, 10, and 11, respectively. Another 16 Taiwanese subjects, all of whom had self-selected Pay Structure 5, were in group ASSIGNED-2. They were assigned to increasing numbers of categories (starting with the adjacent category) away from their self-selected pay structures, i.e., four each were assigned to Categories 6, 7, 8, and 9, respectively. Four other Taiwanese subjects had self-selected Pay Structure 11 and could not be moved in the same direction as the other subjects in either assigned group. These subjects were assigned to Category 7 for comparison with four other subjects who had been moved up to the same category from their self-selected Category 3. Table 1 summarizes these subject assignments.⁷

Within the US sample, 11 subjects were in group ASSIGNED-1. They had self-selected Pay Structures 8, 9, and 10 and were assigned to Categories 4, 5, and 6, respectively. Thirty-one subjects who had self-selected Pay Structure 11 were placed in group ASSIGNED-2. Of these subjects, 8, 8, 8, and 7, respectively, were assigned to Categories 10, 9, 8, and 7. The one remaining unmatched US subject had self-selected Pay Structure 1. This subject could not be assigned to any pay category for a meaningful comparison with others and was deleted from Part II of the experiment.

3.2.3. Part II

In this part of the experiment, subjects made an expenditure decision based on either their self-selected or assigned pay structures (depending on their assigned experimental treatment). The US subjects were told that they would be paid cash at the rate of US\$2.00 for each 1000 experimental dollars earned. The Taiwanese subjects' cash pay rate was NT\$2 for each NT\$1000 in experimental earnings.

In making the expenditure choice, each subject was told to assume that he/she was the engineer in his/her team working on design Stage A of a new product and that subsequently, his/her teammates would take over Stages B and C. He/she has just completed the first month of Stage A and the actual expenditure for this month had been US\$100,000 as budgeted. However, he/she has just obtained private information that the second month's resource requirement would exceed the budgeted US\$100,000 amount by at least US\$20,000. The subject was provided a range of Month 2 expenditure options (Table 2). He/she was told that this information was known only to him/her, and that nobody else in the company would be able to gain access to it at any time.

⁷ Table 1 shows that US subjects preferred more team-based rewards as compared to their Taiwanese counterparts in Part I of the experiment. This result may initially appear as surprising. However, as reported in Awasthi et al. (1998), it was an indication that people can be resourceful in responding to the demands of the task. Many US subjects indicated that they had voluntarily selected a team-based pay structure so as to counteract their own, and their teammates', individualistic tendencies.

Table 1
Pay structure selection (Part I) and assignments (Part II)

Panel A: Chinese Sample from Taiwan

Pay structure category	Subjects selecting each category in Part I	Self-selected Group		Imposed Assignment Group			
		Self-selected subjects with U.S matches (SELF-SELECT)	Subjects who were each moved down 4 categories (ASSIGNED-1)		Subjects who were moved down from 1 to 4 categories (ASSIGNED-2)		
			Self-selected category	Imposed category	Self-selected category	Imposed category	Other subjects ^a
1	2	2					
2	1	1					
3	10	4	6				
4	6	1	5				
5	19	3				16	
6	15	9	6				
7	5	1	4				
8	1	1					
9	4	4					
10	0	0					
11	9	5					4
TOTAL	72	31	21			16	4

Panel B: U.S. Sample

Pay structure category	Subjects selecting each category in Part I	Self-selected Group		Imposed Assignment Group			
		Self-selected subjects with Taiwan matches (SELF-SELECT)	Subjects who were each moved down 4 categories (ASSIGNED-1)		Subjects who were moved down from 1 to 4 categories (ASSIGNED-2)		
			Self-selected category	Imposed category	Self-selected category	Imposed category	Other subjects ^b
1	3	2					1
2	1	1					
3	4	4					
4	1	1					
5	3	3					
6	9	9					
7	1	1					
8	4	1	3				
9	7	4	3				
10	5	0	5				
11	36	5				31	
TOTAL	74	31	11			31	1

^a Moved down 4 pay categories to category 7.

^b Deleted from Part II.

Table 2
Possible alternative choices of Month 2 resource expenditures and their effects on subsequent design stages' resource requirements

Stage A		Stage B		Stage C		Total
Month 1 (already spent), US\$	Month 2 (available options), US\$	Month 1, US\$	Month 2, US\$	Month 1, US\$	Month 2, US\$	Project expenditure, US\$
100,000	120,000	126,750	126,750	126,750	126,750	727,000
100,000	125,000	125,400	125,400	125,400	125,400	726,600
100,000	130,000	124,050	124,050	124,050	124,050	726,200
100,000	135,000	122,700	122,700	122,700	122,700	725,800
100,000	140,000	121,350	121,350	121,350	121,350	725,400
100,000	145,000	120,000	120,000	120,000	120,000	725,000
100,000	150,000	118,650	118,650	118,650	118,650	724,600
100,000	155,000	117,300	117,300	117,300	117,300	724,200
100,000	160,000	115,950	115,950	115,950	115,950	723,800
100,000	165,000	114,600	114,600	114,600	114,600	723,400

Table 2 shows that all of the available options involved a self vs. team tradeoff. For each US\$5000 expenditure above US\$120,000 up to a total increment of US\$45,000, the *monthly* resource requirements for Stages B and C are reduced by US\$1350 (total Stages B and C savings of US\$5400). Thus, for all subjects except those paid 100% based on team performance, choosing the US\$120,000 Month 2 expenditure level would yield the highest personal pay. But at this expenditure level, performance and pay for the other two engineers in the team, as well as for the team as a whole, would be at their lowest levels. As Stage A's Month 2 expenditure increased, measured performance and pay for the subject decreased while those for his/her two teammates as well as the team increased. The extent of this self vs. team tradeoff was greater the higher the proportion of individual-based performance in the subject's pay structure.

After writing down their choice of Month 2 expenditure, the subjects answered several manipulation-check questions and an open-ended question on the reasons for their choice. Then the experimental materials were collected and the subjects were dismissed. Pay was dispensed later after each subject's earnings had been verified.

3.3. Results

In both parts of the experiment, subjects were kept only if they had answered at least "3" to an exit question about the extent to which they had made their decisions in the simulation as if engaged in a real-life situation (1 = *very little* and 5 = *very much*). Four subjects were dropped from Part I due to this screening device.

One subject failed to return for Part II, and three others were dropped due to a below-3 response to the screening question for this part. One more subject was dropped due to deletion of his/her cross-nation match. And, as was discussed earlier, one US subject was dropped because he/she could not be assigned to a pay structure for a meaningful test. Thus, the final

sample size for Part II was 140 subjects, 69 from Taiwan and 71 from the US. The average response of these subjects to the “real life” question was 4.30.

3.3.1. Manipulation checks

The individualism scores for the Taiwanese and US samples were computed following Hofstede (1980). Their values were 6.03 and 72.81, respectively. The numerical difference between the two national samples was somewhat smaller than that reported in Hofstede (1980, 1991), but in the same direction.⁸

3.3.2. Test of Hypothesis 1

Hypothesis 1 stated that individuals’ tradeoffs between self and team performance can be modified by an imposed performance-based pay structure. To focus on the effects of imposition, the effects of the pay structure, per se, were controlled by means of matched pairs. Within each pair, one subject had made his/her choice of Month 2 expenditure (EXPENSE) under his/her self-selected pay structure (SELF-SELECT), whereas his/her match had been assigned to that structure away from the one that he/she had self-selected (ASSIGNED-1 and ASSIGNED-2). Because the pay structure categories involved in these matched-pair tests had almost no overlap between the CNT and US samples, separate tests were performed for each national sample. Two different sets of matched pairs were formed within each national sample.

3.3.2.1. CNT. In the first set of matched pairs, both members of each pair worked under the same pay structure in Part II of the experiment. However, one member had self-selected while the other had been shifted to that category from a less team-based pay structure. As shown in Table 3, Panel A, a total of six such pairs were feasible: one in Category 7, one in Category 8, and four in Category 11.⁹ The mean value of EXPENSE for the SELF-SELECT subjects was US\$154,000; that for their ASSIGNED-1 matches was US\$141,000. (Higher expense indicated more team-oriented decisions.) Because of the small sample size, the Wilcoxon matched-pairs signed-ranks test was used to compare EXPENSE between the two groups, so as to control for non-normality and outliers. The result ($Z = 1.826$, $P = .068$) indicated that as compared to the subjects who had self-selected these pay structures, the subjects who had been shifted to them from more individual-based structures still had made expenditure choices which relatively favored themselves over their teams.

In the second set of matched pairs, both members had originally self-selected the same pay structure, but one member worked in Part II under his/her self-selected pay structure while the other was *shifted to* a more team-based pay structure. There were 12 such

⁸ Our aim in collecting the subjects’ individualism measures was to validate that our Chinese and US subjects did differ culturally in the expected direction. We focused on individualism because it was implicated in both hypotheses. In hindsight, collecting data on power distance could have further strengthened the manipulation checks of our study.

⁹ Where more than one subject was available for matching with a subject from the other group (e.g., Pay Structure 11, where there were five subjects in the SELF-SELECT group but only four in the ASSIGNED-1 group), selection was random.

Table 3
Summary of Hypothesis 1 matched pair comparisons: Chinese sample from Taiwan

n of matched pairs	SELF-SELECT member of the pair	ASSIGNED member of the pair	
	Self-selected categories that subjects were also assigned to	Pay categories that subjects had self-selected	Pay categories that subjects were assigned to
<i>Panel A^a</i>			
1	7	3	7
1	8	4	8
4	11	7	11
<i>Panel B^b</i>			
4	3	3	7
1	4	4	8
6	6	6	10
1	7	7	11

^a Both subjects in the pair were assigned to the same pay category, but one subject had self-selected that category while the other was shifted to that from a less team-based one, four categories away. Thus, each matched pair contained one ASSIGNED subject, who was matched for comparison with one SELF-SELECT subject in the pay category the former was *shifted to*.

^b Both subjects in the pair had self-selected the same pay structure, but one subject was shifted to a more team-based structure, four categories away. Thus, each matched pair contained one ASSIGNED subject, who was matched for comparison with one SELF-SELECT subject in the pay structure category the former was *shifted from*.

matched pairs possible (Table 3, Panel B): four in Category 3, one in Category 4, six in Category 6, and one in Category 7. Mean EXPENSE for the 12 SELF-SELECT subjects was US\$135,833; that for their ASSIGNED-1 matches was US\$132,083. There was no significant difference between the two groups ($Z=0.968$, $P=.332$). This means that the subjects who had been assigned to more team-based pay structures still had made expenditure choices similar to those of their SELF-SELECT matches who were working under their original, less team-based self-selected structures. Thus, in both tests with the CNT sample, imposing a more team-based pay structure did not induce individuals to shift their expenditure decisions in favor of the team's collective interests. Yet attaining such an outcome is the presumed objective of placing individuals in more team-based pay structures than they would have selected for themselves.

3.3.2.2. US nationals. As with the CNT sample, two sets of matched pairs were formed. In the first set, both members of a pair worked under the same pay structure in Part II of the experiment, with one member having self-selected, and the other having been shifted to that pay structure from a more team-based pay structure. As shown in Table 4, Panel A, a total of nine such pairs were feasible: one in Category 4, three in Category 5, and five in Category 6. Mean EXPENSE for the SELF-SELECT subjects was US\$135,556; that for their ASSIGNED-1 matches was US\$137,778. The difference between the two groups was not significant ($Z=0.314$, $P=.753$) using the Wilcoxon matched-pairs signed-ranks test. This result is consistent with the imposed pay structure having shifted the decisions of US subjects

Table 4
Summary of Hypothesis 1 matched pair comparisons: US sample

n of matched pairs	SELF-SELECT member of the pair	ASSIGNED member of the pair	
	Self-selected categories that subjects were also assigned to	Pay categories that subjects had self-selected	Pay categories that subjects were assigned to
<i>Panel A^a</i>			
1	4	8	4
3	5	9	5
5	6	10	6
<i>Panel B^b</i>			
1	8	8	4
3	9	9	5

^a Both subjects in the pair worked under the same pay structure, but one subject had self-selected that structure and the other was shifted to that structure from a more team-based one, four categories away. Thus, each matched pair contained one ASSIGNED subject, who was matched for comparison with one SELF-SELECT subject in the pay structure category the former was *shifted to*.

^b Both subjects in the pair had self-selected the same pay structure, but one subject was shifted to a less team-based pay structure, four categories away. Thus, each matched pair contained one ASSIGNED subject, who was matched for comparison with one SELF-SELECT subject in the pay structure category the former was *shifted from*.

to favor their self-interests relatively more than those of their teams, like those of their compatriots who had self-selected these pay structures.

In the second set of matched pairs, both members had originally self-selected the same pay structure, but one member worked in Part II under his/her self-selected pay structure while his/her match was shifted away from that to a less team-based pay structure. Only four such pairs were feasible (Table 4, Panel B). Mean EXPENSE for the SELF-SELECT subjects in this matched set was US\$143,750, while that for their ASSIGNED-1 matches was lower—US\$131,250—as might be expected if the pay structure did produce the anticipated effect. However, the difference between the two groups was not statistically significant ($Z=1.342$, $P=.179$) using the Wilcoxon matched-pairs signed-ranks test. This finding is consistent with the imposed pay structure not having shifted the subjects' decisions substantially from what they, as proxied by their matched subjects, would have made under their self-selected pay structures. However, an important caveat about this result is that it may be an artifact of the low statistical power from a very small sample size. Thus, we interpret the preponderance of US results to be supportive of a significant effect on teamwork behavior. In this case, imposing a more individual-based pay structure induced expenditure decisions, which departed more from maximizing the team's collective interest.

3.3.3. Test of Hypothesis 2

Hypothesis 2 stated that individuals working under imposed pay structures will be less satisfied than those working under self-selected pay structures, and that the difference in job satisfaction between such individuals will be greater for US than for Chinese nationals.

These predictions were tested with a regression using all 140 subjects from Part II. The dependent variable was the subjects' response to an exit question on satisfaction with the pay structure (SATISFACTION).¹⁰ The independent variables were TEAMPROP (percentage of team-based pay in the performance measure; 0–10, where 0 = 0% team-based and 100% individual-based pay, 1 = 10% team-based and 90% individual-based pay, 10 = 100% team-based and 0% individual-based pay, etc.), COUNTRY (0 = Taiwan, 1 = US), ASSIGN (0 = SELF-SELECT, 1 = ASSIGNED-1 or ASSIGNED-2), and the interaction term between COUNTRY and ASSIGN. The equation as a whole was highly significant (adjusted $R^2 = .210$, $F = 10.26$, $P = .00001$), neither TEAMPROP nor COUNTRY was significant (respectively, $t = 1.14$, 0.451 ; $P = .256$, $.653$), but both ASSIGN and ASSIGN \times COUNTRY were significant (respectively, $t = 4.38$, 3.55 ; $P = .00001$, $.0005$).

Both the coefficients for ASSIGN and ASSIGN \times COUNTRY had negative signs (respectively, $-.402$ and $-.305$). The former result is consistent with both CNT and US nationals being less satisfied when they work under imposed pay structures. The latter is consistent with the reaction to imposed pay structures being different between the CNT and US subjects. To further elucidate the direction of this interaction, separate comparisons of SATISFACTION were performed for each national sample. Within the CNT sample, subjects under imposed pay structures had a lower mean than those under self-selected structures (3.15 vs. 3.43), though this difference was not statistically significant ($t = 0.705$, $P = .433$). The US subjects under imposed pay structures likewise were less satisfied (2.49 vs. 3.97) and in this case, the difference in means was highly significant ($t = 4.943$, $P = .00001$).¹¹ This contrast is consistent with the prediction based on the CNT subjects' lower individualism and higher power distance, that relative to their US counterparts, they would more willingly acquiesce to the dictates of their superiors.

4. Summary and discussion

In the current era of global economic exchange, it is important to acknowledge that people of different national origins can have different work-related cultures. These differences may facilitate or impede the adoption of management practices that have worked effectively in other national settings.

This study has investigated the behavioral effects of imposing performance-based pay structures in a teamwork setting. It postulated that the effects of such imposition on employees' decisions and satisfaction would depend on two work-related cultural values — individualism and power distance. Subjects from the US represented a high individualism–low power

¹⁰ The question was: "To what extent do you feel satisfied with the pay arrangement you worked under?" The five-point response scale was anchored by 1 = *very little* and 5 = *very much*. We did not include other questions, such as satisfaction with the nature of the task interdependence and the total amount of pay, because they were less sharply focused on the performance-based pay structure part of the employment relationship.

¹¹ We also conducted comparisons using various subsets of the sample (e.g., the matched pairs used to test Hypothesis 1). The results were not qualitatively different and are not reported here.

distance culture, while CNT represented a low individualism–high power distance culture. The findings indicated that imposing a more team-based pay structure on the CNT subjects did not induce behavior that was more in favor of collective interests, while imposing a more individual-based pay structure on the US subjects did tend to shift behavior away from maximizing the collective interest. In other words, imposing a PERS was effective in shifting behavior away from the collective interest, but not in the opposite, and presumably desired, direction.

However, it is important to note two caveats relating to this finding. First, because the US and CNT subjects had systematically different distributions of self-selected pay structures, the experiment was restricted to shifting the US and Chinese subjects in different directions away from these structures (towards more individual-based for the former and towards more team-based for the latter). The results on the subjects' decisions may have been, at least in part, driven by these different directional shifts.¹² Since the data and sample sizes in this study did not permit isolating the potential confounding effects of this factor, future studies — especially ones with much larger sample sizes — are needed to resolve this issue. The second caveat relates to the choice of parameter values. In the experiment, the size of the self vs. collective interests conflict, as translated into pay, was relatively small. Different results might have been found if the divergence between the two were larger.

In addition to impacts on decisions, this study also found that US nationals working under imposed pay structures were significantly less satisfied than their compatriots working under self-selected structures. Again, and consistent with culture-based expectations, their Chinese counterparts from Taiwan did not exhibit similarly significant differences in satisfaction.

Taken as a whole, this study's findings can provide useful insights for the design of PERS across national boundaries. For example, they indicate that among US nationals — representatives of an individualistic national culture — imposing a PERS can significantly affect employees' behavior, though this effect may have to be traded off against decreases in employee satisfaction. The thrust of these findings would seem to accord with the focus on PERS in the primarily Anglo-American theories and practices. But for CNT — representing a more collective national culture — imposed PERS was more readily acquiesced to, though there also was less impact on employee behavior. Since these are potentially significant implications, it would be important to test the reproducibility, robustness, and boundaries of this study's findings. Below, we discuss four limitations of this study as the basis for offering some suggested directions for future research.

¹² A reviewer has suggested the possibility that our different results between the US and CNT subjects could be due to the two samples not having similar understanding of the experiment, and/or not being equally willing to play the "game" as if for real. Such a concern applies to all experimental studies and we are unable to definitively dismiss it. However, a priori, we are unable to discern a reason to expect such a systematic difference, especially because (as reported in the Results section) all of the subjects indicated that they had acted in the experiment with a high level of realism.

First, the laboratory experiment in this study has assumed a linear type of interdependency where one team member's decisions affect only downstream operations, and both individual team members' personal performance and their effects on the team are known with certainty. Many cases of teamwork have more complex interdependencies where effects are recursive and uncertain, with synergies among team members that may only be measured with error. How alternate modes of performance evaluation and rewards affect employee behavior in such more complex team-based work settings is worthy of study.

Second, this study has used a one-period experiment, even though it did make explicit the multiperiod nature of the team relationship and task. In an ongoing work relationship, factors such as social pressure, mutual monitoring, and the potential for future retaliation/cooperation may affect each team member's decisions and actions. Expanding the scope of investigation to include these other control and motivational mechanisms in a multiperiod setting would be worthwhile.

Third, this study has used only one performance measure for each team member. Increasingly, firms are moving towards the use of multiple performance measures, including both financial and nonfinancial yardsticks. How the use of such combinations (e.g., the "balanced scorecard") affects individual employees' ability to undertake self-interested actions is worthy of investigation.

Finally, new management practices, such as teamwork, often are implemented in tandem with other methods (e.g., total quality management, just-in-time, employee empowerment). These management packages may affect the nature of the individual vs. collective interest conflict, and at the same time involve multiple cultural values (e.g., power distance in the case of employee empowerment). Concurrent with performance evaluation and rewards, organizations also can use mechanisms like recruitment, selection, indoctrination, training, mentoring, and career ladders, to influence employees' behavior and acceptance of their systems (Chatman, 1989; Pascale, 1985; Van Maanen & Schein, 1979). It would be desirable, though admittedly also challenging, to extend empirical testing to these more complex settings.

Acknowledgments

The authors are indebted to C.F. Koo Cultural and Educational Foundation and Seattle University's SeaFirst Volpe Fellowship for providing financial support for this study. The many helpful suggestions of two anonymous reviewers also are gratefully acknowledged.

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Pergamon

The International Journal of Accounting
36 (2001) 311–327

The
International
Journal of
Accounting

Accounting and management controls in the classical Chinese novel: *A Dream of the Red Mansions*

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Abstract

This study presents a systematic documentation of Chinese accounting and management control practices in two eminent family households of the early Qing Dynasty. There is a lack of information on management control during this period (during the 18th century) and a scarcity of empirical evidence on the control practices of family institutions in ancient China. We attempted to address these problems by analyzing the accounting and management control practices described in the popular novel *A Dream of the Red Mansions*. Further analyses were made to ensure that the control practices thus observed were in harmony with the social and cultural settings of the early Qing Dynasty. Pairing the control practices observed in the novel with a definite set of cultural and social values led to several empirical conclusions. Big family households of the early Qing Dynasty clearly recognized the importance of, and made distinct achievements in, accounting and management controls. They mastered the segregation of duties, the control of cash, the use of budgets for planning, the containment of costs, and the efficiency of operations. However, social and cultural factors that were prevalent during the Qing Dynasty impeded the effectiveness of such practices. The obsession with preserving harmony in society and the family system eventually led to excessive power distance and rigid rules, at the expense of flexibility and professionalism. As history is often indicative of the future, the research results should facilitate our understanding of the management of family-owned businesses in Chinese communities. © 2001 University of Illinois. All rights reserved.

Keywords: Accounting history; Accounting and management control; *A Dream of the Red Mansions*; Cultural and social perspective of control

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1. Introduction

This study investigates Chinese accounting and management controls among big family households of the early Qing Dynasty. Our approach is to analyze descriptions of the control systems of two eminent families in *A Dream of the Red Mansions*. In the remainder of this section we provide historical details that will facilitate an understanding of this unusual approach. Then we will elaborate on our research objectives and their significance. Finally, biographical information on the novel's author is presented in Appendix A.

1.1. The novel in historical perspective

A Dream of the Red Mansions (*Hung Lou Meng* in Chinese) was authored by Tsao Hsueh-chin (Tsao, 1792),¹ and is acclaimed as one of the four greatest classical Chinese novels: the other three being *Journey to the West*, *Romance of the Three Kingdoms*, and *Outlaws of the Marsh*. Using the criteria of mass and academic appeal, it has been widely acknowledged as one of the world's masterpieces (Levy, 1999; Lin, 1935). The novel consists of 120 episodes, the first 80 of which are accepted as the authentic writing of Tsao, whereas the last 40 episodes are alleged to be the contribution of Kao Ngo (Lin, 1966). Although Kao's name has never appeared in any published Chinese version, well-informed readers have been aware of this coauthorship.² The inclusion of Kao as a coauthor in translated editions merely serves to inform readers outside China of his contribution.

Whatever the provenance of the last 40 episodes, it is clear that Tsao intended the novel to faithfully represent the rise and fall of two related eminent families, the Jung and the Ning Houses, during the early Qing Dynasty. The clue to the eminence of these families stems from the use of *red mansions* in the novel's title. In imperial China, mansions with

¹ The novel is known by several titles, with the more common being *A Dream of the Red Mansions*, *A Dream of the Red Chamber*, *The Story of the Stone*, *The Story of A Monk with Passion*, and *The Twelve Ladies of Nanking*. The novel has been translated into languages other than Chinese, including English, French, German, Hungarian, Italian, Japanese, Korean, Spanish, Russian, and Vietnamese (Hu, 1993; Wang, 1988), which has led to extensive research in Japan, Korea, and the United States, apart from continuous research in China. Popular English versions include, among others, translations by Hawkes (1987) and Yang and Yang (1994). The Yang and Yang translation is based on the 120 episodes and thus presents a complete narrative with an acceptable ending. It matches the essence of the 120-episode Chinese version. However, Hawkes' translation includes only the first 80 episodes of the novel.

² Kao himself claimed not to have completed the novel. Instead, he took credit for rediscovering the missing parts of the manuscript after a relentless search of about 30 years. This admission was made in his capacity as editor, and printed in the preface to the 1792, 120-episode publication. In the same light, some modern researchers doubt Hu Shih's insistence that Kao wrote the last 40 episodes. These researchers include, among others, Chao and Chen (1975), who accepted Kao's admission of finding the missing manuscript as a reliable statement. It is noteworthy that before 1792, circulated copies of the novel contained only the first 80 episodes. These were all hand-copied versions with substantial errors and omissions. Hand-copied versions were costly, thus limiting mass circulation. However, the 1792 version was published using movable character printing. This facilitated the production of about 300 copies in a single edition for wider circulation.

red-plastered outer walls were symbolic of wealth, grandeur, and power. Hence, all palaces, temples, and courthouses had red walls, whereas habitations of commoners were mostly gray. Tsao urged his readers to ponder this distinction, and consider the lives lived behind red walls as part of a *dream*. Tsao himself had been raised in a fabulously luxurious home before his life was blasted into nothingness. In middle age, as a bankrupt scholar who lived in a decrepit hut, only his imagination could help him relive that dream-like past.

Moreover, Tsao used the dream motif because the tale that he narrated was politically sensitive in the repressive environment of the early Qing Dynasty. He wrote of family misfortunes extending over 20 years, piled on reflections of ancestral glory, and set amidst a desperate awareness of the gradual erosion of social status. Most pointedly, he described the confiscation of family properties through an imperial decree. To further distance his own experience from those narrated, Tsao devoted substantial passages to explain how he supposedly obtained the manuscript. Readers were told that a Taoist monk found the story inscribed on a huge rock which is nestled in some far-off mountains. The mythical quality of this conceit was strengthened by Tsao's absurd references to the rock measuring 120 feet high, and 240 feet wide. Unbelievably, the Taoist monk was said to have copied the story from the rock inscriptions and delivered the manuscript into Tsao's care.

Only after having established this alibi did Tsao admit that he then worked on the manuscript for 10 years, revising it five times, and dividing it into episodes. Finally, he wrote the following verse to commemorate the effort (Lin, 1935, p. 270):

These pages tell of babbling nonsense,
A string of sad tears they conceal.
They all laugh at the author's folly;
But who could know its appeal?

Tsao's rhetorical soliloquy demanded no answer, but his tale's rich humanity and touching sense of personal tragedy has long been a talking point. Episodes from the novel have been the basis for innumerable tales, operas, and movies. To appreciate the novel's position in Chinese society, we must imagine a work with the scope and popular appeal of Margaret Mitchell's *Gone with the Wind* (Levy, 1999). Scholars, however, look beyond the novel's literary merits alone, and towards Tsao's enigmatic relation to the events about which he wrote. They are inclined to reject his claim of writing *babbling nonsense*, and consider the novel as a thinly disguised biographical account of historical, social, and economic events. Over the last century, the search for historical evidence to support this hypothesis has led to the development of a science commonly known as *redology* in Chinese literary circles (Alexander, 1976; Chao & Chen, 1975; Cooper & Zhang, 1993; Edwards, 1994; Hu, 1993; Hu, Wu, Tsai, & Li, 1961; Knoerle, 1972; Levy, 1999; Lin, 1966; Lu, 1992; Minford, 1980; Tsai, 1930; Yu, 1957, 1978; Zhou, 1989). Such scholastic pursuits both inside and outside China are comparable in dignity and volume to commentaries on the works of Shakespeare or Goethe (Lin, 1935; Yang & Yang, 1994).

1.2. Objectives of this study

We are not interested in determining whether *A Dream of the Red Mansions* is pure fiction or thinly disguised biography. What is more important is that Tsao created a literary piece embedded with concrete traces of historical evidence. The novel was written during the reign of Emperor Chien Lung (1736–1795), a period that has often been heralded by Chinese historians as a “Golden Age.” Tsao’s writing covered most walks of life, with extensive and in-depth personal attestation to the prevailing culture, politics, economics, social structure, and management practices of the time (Li & Li, 1995). Therefore, we take the position that the novel has historical significance, and is relevant to the study of accounting and management controls in 18th century China, especially as alternative documentary evidence is nonexistent.

Based on this premise, we undertook to draw generalized conclusions on accounting and management control practices of the early Qing Dynasty by referring to various episodes of the novel. Since accounting and management control principles inductively derived might have been conceptually falsifiable, either through the imagination of the author or by our own selection bias, analyses were made to ensure that generalizations drawn from the novel were consistent with the social and economic environment of the early Qing Dynasty. It was expected that pairing the observed system of accounting and management controls with both time and environment would eventually lead to reasonable explanations, not only for the unique characteristics of the system, but also its deficiencies from a historical perspective.

The results of this study add to the literature, which lacks a reasonable part of the picture on accounting and management control of family institutions in imperial China. Traditionally, research studies on the accounting history of China have focused on the developments of bookkeeping and accounting in ancient dynasties, with the first single-entry bookkeeping system dating back to the Zhou Dynasty (1100–771 BC) (Aiken & Lu, 1993a, 1993b, 1998; Fu, 1971; Lin, 1992). In the last two decades, most research on Chinese accounting has been occupied with developments since the economic reform of 1979 (Abdel-khalik, Wong, & Wu, 1999; Chen, Jubb, & Tran, 1997; Chow, Chau, & Gray, 1995; Davidson, Gelardi, & Li, 1996; Graham & Li, 1997; Lefebvre & Lin, 1990; Skousen & Yang, 1988; Winkle, Huss, & Chen, 1994; Xiang, 1998; Zhou, 1988). These studies have revealed, to an important extent, that China was then on the verge of rapidly adopting or “importing” Western accounting and control measures, because pre-reform accounting and management methods were incapable of coping with the changed post-reform environment. Our examination of the accounting and control systems employed under the Qing Dynasty, based on *A Dream of the Red Mansions*, showed a similar atrophy. However, Chinese family-owned institutions of the 19th and 20th centuries managed to maintain some traditional methods while adopting Western management control measures. Blending traditional control measures with Western management controls has assured the success of many business institutions in modern Taiwan and Hong Kong. These success stories beckon to Chinese state-owned enterprises as potential models for improvement in the post-reform era.

The research results, therefore, should also provide a better insight into current management practices among Chinese enterprises, particularly entities controlled by families. Family-owned businesses have been, and still are, the overwhelming norm in Chinese

communities. For example, in Hong Kong, the Hang Seng Index contains 33 blue-chip companies, and at least 22 of them are controlled by families (Shi, 1998). In Taiwan, the situation is similar. Forty-five out of the 100 largest corporations are family-owned (China Credit Information Service, 1998, 1999). The percentage of family-controlled corporations in Taiwan would be over 62 percent if both firms with state ownership and foreign subsidiary multinationals were excluded. In this light, our study of the accounting and management control of big family households has special relevance for enhancing our understanding of management practices in contemporary Chinese enterprises.

Finally, this paper encourages the use of insights from an earlier time and different environment to help develop innovative teaching materials for management accounting. Currently, the study of *A Dream of the Red Mansions*, accessible through translated versions in many major languages (see footnote 1), is a compulsory part of the curriculum for classical Chinese literature in most universities around the world. We suggest that new perspectives on the accounting and management control procedures described in the novel might develop. Most importantly, analytical results might provide not only the needed insight for new system design, but also the rationalization for explaining control systems as they were, or how they could otherwise have been. The study of management control through literature can help motivate the education process by instilling enthusiasm in students.

The remainder of this paper is organized as follows. Accounting and management control procedures and practices directly observable in the novel are presented in the next section. This is followed by analyses of the strengths and weaknesses of these controls, relative to the social and cultural environment of the time. The final section provides a summary of implications and conclusions.

2. Accounting and management controls

A Dream of the Red Mansions presents multiple aspects of the leisurely life of two related households during the early Qing Dynasty. The Jung and Ning families each owned mansions where several generations of masters and mistresses were attentively cared for by supporting layers of maids and servants. Bondservants numbered in the hundreds in each household and were kept to ensure the comfort of members. As expected in any business enterprise involving multiple functions, there arose the need for the division of labor. People were assigned to work in such positions as domestic assistants, seamstresses, gardeners, purchasers of supplies and other amenities, custodians, bookkeepers, rent collectors, messengers, security officers, and supervisors. Capable and loyal members from the lower hierarchy of the families were often recruited to help with special ad hoc projects. Under such circumstances, there inevitably emerged the need for control and coordination, to ensure efficient and effective operations.

The coexistence of a leisure class with a working class in the Jung and Ning Houses allows us to view each as a society in miniature (Cheng, 1980). Furthermore, the hierarchical structure of the two households allows us to analyze the social and cultural dimensions of control practices. While concepts of accounting and management control are manifest in the novel, their application is most prominent in two major events. First, they are accessible in the

descriptions of preparations for, and the supervision of, a month-long funeral in the Ning House in Episodes 13 and 14. Second, they are easily recognizable in the revision of then existing management policies and practices for the improvement of operations in the Grand View Garden of the Jung House in Episodes 55 and 56.

2.1. Episodes 13 and 14

Chia Chen was supreme master of the Ning House. When his daughter-in-law died after a sudden illness, a long period of mourning was immediately declared. Recalling her filial attitude to elders and genuine kindness to others, Chia Chen decided, against customary practice for handling young death, to hold a grand funeral. Such a funeral was consistent with the religious belief that honoring the dead would eventually save the soul. Under Chinese funeral rites that had often been tainted with Buddhist and Taoist conventions, the corpse was to lie mildly embalmed in the coffin, and remain in-house for 49 days before the funeral. During the declared period of mourning, rites were to be performed by 108 monks, 99 Taoists, 50 high bonzes, and 50 Taoist chiefs. Prayers were to be lavished at frequent intervals to invoke all the divinities to show compassion, so that the departed could be delivered from sin and absolved from retribution. Guest mourners at the funeral were expected to include nobles and hereditary officials and their kin.

Chia Chen was troubled by the fact that his wife was stricken with grief over the loss of her daughter-in-law and unable to oversee the process. He was especially concerned that unexpected breaches of etiquette might occur while nobles were present. Therefore, he decided to invite his able cousin, Ms. Wang Hsi-feng, to take charge of the Ning House during the mourning period. Hsi-feng loved to show off, and looked forward to having a chance to fully convince others of her management ability.

Once in transitional command of the Ning House, Hsi-feng wasted no time in studying the system of controls and identifying the problem areas before taking corrective actions. She considered the absence of discipline arising from the lack of segregation of duties among servants as an obstacle that prevented the household from moving toward effective coordination and control. She was, therefore, determined to deal with the management problems at their root.

2.2. Episodes 55 and 56

In Episodes 55 and 56, Tan-chun (Hsi-feng's cousin) was recruited to manage the Jung House when Hsi-feng fell ill. A major part of her responsibility in managing the Jung House included the supervision of the Grand View Garden, an extension of the main complex with numerous residences set aside for the young masters and mistresses. The garden derived its splendor from imposing pavilions, towers, and lodges with views of hills, streams, lakes, pools, rocks, trees, and cultivated flower patches below. In each residence, the supporting staff included two nurses, four maids, a nanny, and other personal attendants of each young master or mistress. There were, in addition, supporting groups of servants whose duty was to perform the common functions needed for maintenance and other general up-keep of the garden.

The funeral setting in the Ning House, and the daily supervision of the Grand View Garden in the Jung House, provided stages for Hsi-feng and Tan-chun to demonstrate their skills in applying management and control concepts. We have structured our observation of such demonstrations around six major analytical dimensions: (1) establishment of duties and responsibilities, (2) supervisory control, (3) internal accounting control systems, (4) bookkeeping and accounting analysis, (5) control for efficiency, and (6) strategic planning and control.

2.2.1. *Establishment of duties and responsibilities*

In revamping the existing assignment of duties in the Ning House when preparing for the 49-day funeral, Hsi-feng appointed 20 people to work in alternate shifts as ushers for attending guest mourners. Similar arrangements were made for servants whose duty was to serve meals and tea. Forty people, divided into two shifts, rotated among jobs such as burning incense, keeping lamps filled with oil, hanging up curtains, keeping watch by the coffin, offering sacrificial rice and tea, and comforting mourners. Four people were responsible for the custody of cups, plates, and tea sets, while four others were in charge of dinner sets and wine vessels. All members of the same shift within each group were collectively responsible for any mishaps. Eight servants were to receive sacrificial offerings, while another eight were to distribute ritual supplies. Thirty people performed night duty in turn as security. These arrangements released approximately 100 servants to work for different residences in the Ning House. Apart from the main functions, Tsai-ming, a personal maid brought along from the Jung House, performed centralized bookkeeping. Finally, three individuals in each residence, with the support of several assistants, were placed separately in positions of subsidiary bookkeeping, storeroom custodian, and cashier. It is noteworthy that duties did not overlap, and the segregation is summarized in Table 1.

Table 1
Establishment of duties and responsibilities in the Ning House in 18th century China

Team of servants or maids	Respective duties and responsibilities
20 people divided into two shifts	serve as ushers for guests on their arrival and departure
20 people divided into two shifts	serve meals and tea
40 people divided into two shifts	handle burning of incense, keep lamps filled with oil, hang up curtains, watch by the coffin, offer sacrificial rice and tea, and comfort mourners
4 people	have custody of cups, plates, and tea utensils in the pantry
4 people	have custody of dinner sets and wine vessels
8 people	receive presents for sacrificial offerings
8 people	deliver lamps, oil, candles, and sacrificial papers to various places inside the mansion
30 people	perform night duty in turns as security officers
About 100 people	work in different residences and in different functions
1 person with several assistants	do bookkeeping and filing of transaction records
1 person with several assistants	storeroom custodian
1 person with several assistants	cashier

The benefits of segregated duties are recognizable in this situation. Changes in management brought changes in attitude among the servants. During the mourning period, no servant could choose to do easy jobs and leave those more difficult undone. Most importantly, they could concentrate on their own work without unnecessary interruptions, or being called upon to perform work outside the normal call of duty. Evidently, the appropriate establishment of duties and responsibilities is a precondition for sound management and efficient operations, irrespective of whether a business or family operation is involved.

2.2.2. Supervisory control

Hsi-feng recognized the importance of discipline in control. In announcing the new assignments to servants of the Ning House, she was emphatic that her supervision of operations would not be confined to the old way of doing things. Any violation of rules would be punished publicly. To enforce her new rules, she would personally review all staff on the assignment list each morning by calling a roll with the assistance of a trusted maid. She also arranged to have the wife of the chief steward report to her directly and immediately any cases of slackness or other misbehavior. Should there be any cover-ups, the steward's wife would be deprived of a month's allowance. The catchword was compliance. Jobs, no matter how large or small, were to be done according to established schedules. For example, roll calls were made at half-past six in the morning, and servants were allowed to have meal breaks at ten. Operational reports and applications for supplies were to be presented before half-past eleven. To show her own commitment, Hsi-feng would not delegate the overall duty of supervision to others. On a daily basis, she made a final inspection of the Ning House before issuing keys to security officers and other supporting supervisors on night duty.

Once these operational guidelines for coordination were established they became the benchmarks for compliance. There was low toleration for carelessness and inadvertence in the system. For instance, one morning a female usher was late for roll call but asked forgiveness, considering that she had only offended once. Hsi-feng's position was unequivocal. The usher was punished with 20 strokes, and was also docked allowance for 1 month. Hsi-feng used the occasion to reiterate her position and warned that accelerated punishment might be forthcoming for any lateness in the future. The means of control were rigid, but strict enforcement alleviated the problem of prior mismanagement in the Ning household.

2.2.3. Internal accounting control systems

The prevention of fraud and forgery depends upon an accounting system based on proper authorization. In both the Ning and the Jung Houses, procedures that featured modern-day internal control concepts were built into daily operations. In all phases of operation, the proof of having proper authorization in any business transaction was the presentation of a tally. For unity of command, only one tally was used and placed under the control of the individual in charge of each house. For example, when Hsi-feng agreed to manage the funeral for the Ning House, Chia Chen immediately passed the tally to her, thus signifying the delegation of his authority. Henceforth, the holder of the tally was presumed to have the delegated authority to give or carry out orders in any business transaction.

Incidents requiring proper authorization for business transactions occurred with relative frequency in the novel. In Episode 14, there are detailed descriptions of processing requisitions for supplies. For example, when the chief steward’s wife presented a written request for silk cord for making funeral carriage trimmings, Hsi-feng first verified the quantities requested and then instructed the maid to record the requisition. She then approved the transaction by tossing the tally to the chief steward’s wife. However, Hsi-feng rejected another requisition, because two out of the four items requested involved amounts that were significantly more than those in past transactions.

Perhaps the most comprehensive descriptions of control in Episodes 13 and 14 are reserved for cash. The key procedures for the control of cash have been reconstructed and presented in Fig. 1. For instance, a tailor orally requested compensation for his services. This request only formalized upon the preparation of a written requisition slip by the chief steward’s wife. Upon seeing the written requisition, the first thing that Hsi-feng did was to verify its nature and content through comparison with past accounting records and budgets. After this validity check, she ordered the delivery of the requisition to the purchasing agent for another verification. At the same time, she instructed her bookkeeper to enter the transaction in the book. No payment could be made until the performance of the service was fully completed and verified. Authorization for disbursement of cash was finally given by

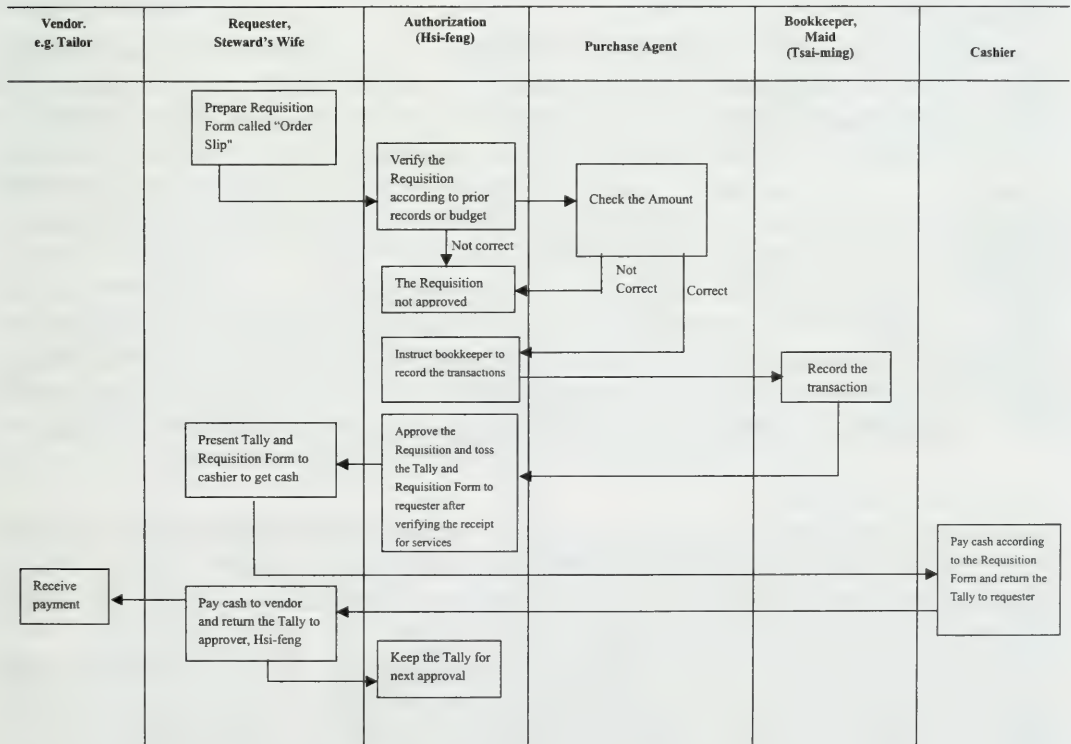


Fig. 1. System of control for cash in the Grand View Garden of the Jung House in 18th century China.

tossing (literally, throwing on the floor) both the tally and the requisition form to the chief steward's wife. Upon inspecting the tally and the approved requisition, the cashier then paid the tailor through the steward's wife. Finally, the tally was returned to Hsi-feng to signify the completion of a cash transaction.

The control procedures described above contain important elements of sound internal control. In most instances, effective control in the Ning House was maintained by requiring proper authorization, segregation of duties, adequate records, and independent verification of transactions. This level of sophisticated control could be explained partly by the inherent nature of cash. After all, cash is the most liquid of all assets easily susceptible to defalcation (high inherent risk). Also, in the absence of a banking industry in 18th century China, it was very likely that large amounts of cash were kept on hand in big households. The volume of cash as well as the level of risk associated with keeping it naturally required greater expenditure of effort for its control.

2.2.4. Bookkeeping and accounting analysis

Maintaining accountability with steadfast reliance on bookkeeping was emphasized in both households. In Episode 13, for example, Hsi-feng's first task related to planning for improved operations in the Ning House was to review the accounting books. Likewise, in making decisions of a financial nature, she relied on Tsai-ming to record all transactions in chronological order.

Accountability apart, the insistence on recording every transaction of a financial nature served to establish benchmarks for the uniformity of practices in decisions associated with specific events. Hsi-feng used past accounting records to determine the reasonableness of infrequent requests for supplies. She also used those records to plan the timing of requisitions. For instance, a woman was late in making a requisition for incense and oil for lamps. When she finally showed up, she was greeted by Hsi-feng with this statement: "I knew it was time for you to come today but thought you had forgotten."

Tan-chun practiced the same reliance on past accounting records in Episode 55. Upon the death of a relative, she had to decide the appropriate amount of condolence money for dependents of the deceased. For various reasons, the chief steward's wife tried to distance herself from Tan-chun in this situation, as did the other staff. However, Tan-chun wisely dealt with the decision by checking and analyzing past accounting records for similar events.

2.2.5. Control for efficiency

Efforts to improve the efficiency of operations in the Jung household were shown by the use of monthly budgets for the allocation of allowances, the revision of past practices in containing costs, and the generation of new revenue via subcontracting to conserve resources. Such efforts are mainly described in Episodes 55 and 56.

These episodes provide concrete evidence that budgets were used for controlling costs. Presumably, an operating budget featuring expenditures for each residence in the Jung House existed. However, the amounts budgeted were not as specific as in the monthly allowance budget. As shown in the monthly budget for allowances, the amount allocated to the Lady Dowager was 20 taels, and for Hsi-feng it was 5 taels. Young ladies or masters were entitled

to 2 taels per person, while a maid received 1 tael or less, depending on her status within each residence. A lump sum allowance of 8 taels was available for each young master to cover peripheral expenses.

This lump sum particularly incensed Tan-chun as she examined the existing budget for allowances in the Grand View Garden. It was simply a waste of resources because this item should have been adequately covered by the operating-expense allowance of each residence. Tan-chun was aware that closing the loophole in the budget was a necessary step for cutting costs, but not a sufficient condition for achieving efficiency. She was also concerned that waste might result from other dysfunctional operations. The accepted practice of obtaining cosmetics through centralized purchasing was an example of this sort of waste. Admittedly, this practice had been initiated with good intentions. Its sole purpose was to avoid the necessity of sending out maids from each residence to buy cosmetics whenever they were needed. Based on personal experience, however, Tan-chun had reason to believe that the system was not functioning as intended. In particular, cosmetics obtained from centralized purchasing were of such poor quality that subsequent replacements were often necessary. Accordingly, the practice was abolished. The abolition signified the importance of taking corrective actions whenever an operation is not functioning consistently with its original purpose.

Tan-chun's inspiration for generating new miscellaneous revenues to contain costs came directly from her personal observation, and from comparison of her own operational practices with those of others. For instance, Steward Lai Ta's garden was known to have been contracted out at a price of 200 taels of silver a year on the condition that his house be adequately supplied with the resultant produce. Inspired by this practice, Tan-chun decided to work out a similar plan for the Grand View Garden. Certain remote areas of the garden were contracted to a few reliable elderly female servants.

Instead of charging the elderly women a normal rent, they were asked to provide the Jung House with certain necessities. They were required to supply hair oil, rouge, powder, scent, etc., for young mistresses and maids, brooms, dustpans, and dusters for cleaning, and food for the poultry and pets. With these necessities being supplied either from produce of the garden or bought with revenue from the project, the total savings in a year amounted to more than 400 taels of silver. Any remaining profit from the new project was to be kept by the elderly women as reward for their hard work. The family was thus adequately supplied with what they needed, without any additional expenditure of effort and resources.

2.2.6. *Strategic planning and control*

Strategic planning in an institution requires the simultaneous identification of goals and feasible alternatives to achieve those goals. Evidence of strategic planning and control in *A Dream of the Red Mansions* appears in Episode 13, when Hsi-feng is advised by the departing ghost of Chia Chen's deceased daughter-in-law to plan for the family's future. In traditional Chinese society, this was considered something similar to a "revelation" from God. The advice was preceded by the following philosophical admonition: "Fortune follows calamity as disgrace follows honor. This has been true from time immemorial. How can anyone prevent it?"

The advice for strategic planning and control was then laid out in specific operational terms. First, the Jung and the Ning Houses should start setting aside some of the return from their investment in farms near the family cemetery to secure a stable source of funds for the future provision of education to the young and seasonal sacrifice to ancestors. Second, the family school should be relocated to estates close to the family cemetery as a precautionary measure, so that the facilities might be exempted from possible confiscation by the state. Third, rotation of management should be implemented for the suggested investments. This rotation of duties would make it difficult for anyone to conceal potential embezzlements or illegitimate uses of the land for personal benefit.

Essentially, the advice was a family plan for soothing the pain of bankruptcy. This observation is consistent with Hofstede's (1991) classification of Chinese culture as being long-term-oriented. However, given the political environment of the early Qing Dynasty, there were simply too many uncontrollable factors that obviated strategic planning and control in family institutions whose future depended on the favor or disfavor of the Emperor.

3. The social and cultural environment

We noted earlier that accounting and management control systems inductively derived might be conceptually falsifiable. It is therefore important that we address this issue to show that the accounting and management controls thus observed are inexorably linked to cultural, social, and accounting or management control values of the early Qing Dynasty. Our addressing of this issue represents a concurrence with Littleton (1966), who viewed the development of accounting as an evolutionary process in harmony with its surrounding environment.

The social culture of the early Qing Dynasty was not one of the truly indigenous cultures of the world, and as such would offer many interesting points of comparison with Western social culture. While the literature is replete with cultural models for making such comparisons, we found the Hofstede model (Hofstede, 1980, 1984, 1991, 1998) and the Gray model (Gray, 1988), remarkably befitting the purpose of this study.

Understanding Chinese culture is a prerequisite for understanding Chinese society and the control system of the early Qing Dynasty. Hofstede's first "cultural dimension" — *power distance* — is a culmination of cultural influences. According to Hofstede, *power distance* is the extent to which members in a society, organization, or any other type of institution, accept the unequal distribution of power. The existence of a greater level of acceptance is indicative of a society with a larger power distance. Using this definition as a criterion for classification, we would put Qing China under the list of societies with a very large power distance.

Under the early Qing Dynasty, Chinese society placed a great deal of emphasis on the family system, from which all social characteristics were seen to derive (Lin, 1935, p. 175). Within the context of the Confucian social philosophy, there was a direct link between family organization and state effectiveness, as evidenced in the saying that "when the family is orderly, then the state is peaceful." Society was conceptually structured in a simple hierarchy, with five cardinal relationships and one fundamentally important differentiation. The five cardinal relationships were those between ruler and subject, father and children, husband and

wife, between siblings, and between friends. The important differentiation related to the relationship between superiority and inferiority. Social harmony was only achieved when these six elements were individually balanced. The importance of *social status* is especially noticeable as a result of the differentiation between constituents of society. Consistent with the concept of control, social status gave every person a definite place or role in society. In conformity with the humanistic idea of “everything in its place,” the social ideal was also that of “every man in his place” (Lin, 1935, p. 178). Simply stated, if constituents in society knew their role and acted in accordance with their position, then social order was ensured.

The doctrine of social status cut through the idea of equality in a curious way. It is important to see the interplay of power distance to understand accounting and management controls of the early Qing Dynasty, as well as their social idiosyncrasies. For example, understanding the social philosophy for the preservation of harmony leads to a further understanding of why the tally was tossed each time a requisition was approved in *A Dream of the Red Mansions*. The head of the family or his representative tossed the tally on the floor. The steward or maid then knelt down, thanked their master, and collected the tally. In essence, tossing helped emphasize the social distinctions at work in the control situation. It symbolized obedience and the recognition of authority in the family, as well as the state. In the best spirit of Confucianism, accepting a tossed tally was interpreted not as a form of subjection, but as the indication of a harmonious relationship. However, when Hsi-feng agreed to manage the funeral in the Ning House, the tally was passed onto her. Passing, instead of tossing, signified another aspect of maintaining harmony: that is, the equality of relationships between siblings.

The importance of the family system under Confucianism was not only reflected in its vision of the family as the basis of the state (direct transition), but also in the number of cardinal relationships pertaining to the family system. Of the five sets of relationships, three concerned the family. Such emphasis on the family and on the preservation of social harmony is really a negation of individualism. Put simply, this negation leads automatically to collectivism, which has been defined by Hofstede (1980, 1984) as the existence of a relatively higher degree of interdependence among individuals. A collective society is, in essence, a communistic society. The Jung and Ning families very much captured the essence of the communistic principle of “do what you can and take what you need.” This unique social feature was confirmed by the cohabitation of generations of family members and servants in the same households. Mutual helpfulness developed to a very high degree. It was, therefore, a part of common practice for management to focus on groups rather than individuals. This is why Hsi-feng preferred to assign duties to groups of household servants under her supervision during the mourning period before the Ning funeral.

3.1. Impact of social values on accounting and management control

The obsession with preserving harmony in society and within the family system eventually led to rigid and uniform control at the expense of professionalism and flexibility. This empirical development actually confirms the deductive reasoning of Gray (1988). According to Gray’s hypothesis, societies that tend to embrace collectivism, or accept a large power

distance, are more likely to prefer statutory (centralized) control. They also prefer uniformity to flexibility in the control of operations. The precise enumeration of duties and responsibilities for simple supervisory tasks, the insistence on elaborate authorization for cash disbursements and supply requisitions, the frequent reliance on past accounting records for making decisions, and the intensive use of budgets in planning operations and containing costs, are manifestations of the impact of these preferences in *A Dream of the Red Mansions*.

Family institutions of the early Qing Dynasty in China undoubtedly recognized the importance of accounting and management controls. This recognition was the basis for several distinct achievements. It is fair to say that the accounting and management controls of the early Qing Dynasty were as effective as modern control methods in certain aspects. These include the segregation of duties, the control of cash and other transactions requiring proper authorization, adequate accounting, independent verification of transactions, and the use of budgets for planning and containing costs.

However, no refinement of language can conceal the fact that the system of control in big family households of the early Qing Dynasty had several characteristic weaknesses. First, elements that make democratic participatory management successful were conspicuously absent. The system succeeded at best in controlling efficiency in the lower hierarchy of operations, without necessary measures to control abuses by top management. Second, the system was autocratic; punishment was immediate for nonperformance and noncompliance. Fear in the workplace was rather widespread. In the spirit of Deming (1986), we suggest that fear in the workplace is a barrier to pride in workmanship and ultimately to productivity. The greatest source of fear within the Jung and Ning Houses was the evaluation of performance on measures over which servants had little or no opportunity for appeal. Third, the establishment of duties and responsibilities in most instances was not accompanied by commensurate rewards. Hence, there was little incentive or reason for any servant to perform higher than expectations. Whenever managers were too autocratic and rigid, the control system deprived workers of initiative.

The greatest deficiency in the control of such family institutions and operations must be reserved for the possibility of nepotism. Nepotism stemmed directly from the differentiation between superiority and inferiority, and also from communistic cooperation and mutual help within management. Managers in big households were likely to give the best jobs to members of their own family, and if there were not readily available jobs, then they could create sinecures. This practice easily bred corruption and collusion, making it difficult to effectively rotate duties or management at the top. Furthermore, there was no independent evaluation of top management. This deficiency would have serious implications for many of today's family businesses.

4. Implications and conclusions

There are redeeming values in many control systems, and even failures can offer lessons for the future. In this respect, our study has important implications. First, it offers considerable insight into the conditions and requirements that a successful control system

should necessarily and sufficiently possess in a *specific* social and economic environment. State-owned enterprises in China are said to be adopting Western methods to improve their outdated systems of accounting and management control. Yet it is important to note that each environment has its own unique cultural and social characteristics, and policy decisions should be resolved according to those merits.

Finally, history should be studied for a better understanding of the present. The study of past control systems is important for the improvement of our own systems. The major concern of any control system should be efficient and effective operations. There is certainly no such thing as the “one best way” or the “one best approach” to such ends.

Acknowledgments

The authors would like to thank Professors Chee Chow, Lynne Chow, Sydney Gray, Phyllis Mo, John Talbott, Hugh Thomas, and two anonymous reviewers for their insightful comments on an earlier draft of this manuscript. The project was partially funded by a Direct Research Grant of the Chinese University of Hong Kong.

Appendix A. Biographical sketch of Tsao Hsueh-chin

Research on the exact identity of Tsao Hsueh-chin yielded few tangible results at first. A breakthrough was made in 1917 when Hu Shih, leader of the Modern Chinese Renaissance (also known as the May 4th Movement), succeeded in identifying Tsao as the grandson of Tsao Yin. (The research materials covering this important breakthrough are available from *Hung Lou Meng: Research and Validations* by Hu Shih et al. (1961), as included in the Reference List.) According to the history of the Qing Dynasty, Tsao Yin was a versatile scholar who had been a childhood playmate of Emperor Kang Hsi, the ruler of China from 1662 to 1722. Tsao Yin was also known to have served as Commissioner of the Chiangning (Nanking) Textile Prefecture for 20 years from 1692 to 1712.

The Chiangning Textile Prefecture was an imperial enterprise with a workforce of about 825 that was empowered to produce silk and other textile commodities for consumption in the palace, as well as for international trade (Soong, 1999). As Commissioner of the Prefecture, Tsao Yin supervised silk and textile production, and unofficially gathered intelligence in the southern parts of the Qing Empire that still faced racial, political, and military strife. This position of Commissioner, as well as his special personal relationship with the Emperor, enabled Tsao Yin to shrink the Prefecture treasury for semiofficial and private uses. Emperor Kang Hsi had made six inspection trips during his reign to the South, and at least four of those territorial inspections (1699, 1703, 1705, and 1707) were made during Tsao Yin's tenure as Commissioner. As it was customary practice for the Prefecture to provide accommodation for the Emperor on those visits, Tsao Yin seized the opportunity to construct a series of mansions with gardens to meet the needs of the occasions. These mansions and gardens later became the dwelling place

of the author, Tsao Hsueh-chin, who referred to them as the Grand View Garden in *A Dream of the Red Mansions*.

Tsao Yin died in 1712. His grandson, Tsao Hsueh-chin, was born in 1715, approximately 3 years after his father inherited the Commissioner's title, also as a special bestowal from the Emperor. However, the Chiangning Textile Prefecture was audited in 1712 and found short of 263,000 taels of silver, for which Tsao's family was held accountable (Chao & Chen, 1975). Acknowledging the contribution of his own lavishly catered visits to this debt, Emperor Kang Hsi's lenient solution was to appoint the author's father as both Commissioner of Salt Prefecture and Chiangning Prefecture, to expedite reparations. However, upon the death of Emperor Kang Hsi in 1722, the Tsao family still owed the government 45,000 taels of silver. The settlement date was later extended to 1728. When the due date expired without payment, Emperor Yung Cheng ordered immediate confiscation of all the Tsao family properties. Therefore, between 1715 and 1728, the author had about 14 years to enjoy the luxury and honor of a large and powerful family, which he later spent 10 years of poverty recounting in the manuscript of *A Dream of the Red Mansions* (Chao & Chen, 1975).

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Pergamon

The International Journal of Accounting
36 (2001) 329–347

**The
International
Journal of
Accounting**

A comparison of New Zealand and British product-costing practices

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Abstract

The results of a mailed survey designed to compare product-costing practices employed by New Zealand (NZ) and United Kingdom (UK) manufacturing companies is reported. The study's main findings are that, when company size is removed as an explanatory factor, there appear to be few systematic differences in the product-costing practices of the two countries, although there is a suggestion of marginally less sophisticated product-costing practices in NZ. Widespread use of theoretically deficient costing practices in both countries adds to the growing evidence of a time lag between the theory and practice of management accounting. © 2001 University of Illinois. All rights reserved.

Keywords: Product costing; Overhead cost allocation; Management accounting practice

1. Introduction

The recent past has seen considerable criticism of management accounting practice (Cooper, 1990; Johnson & Kaplan, 1987; Kaplan 1984, 1985, 1988, 1990). Critics' primary concern is that management accounting has not responded to developments in the technological and competitive environment, with the result that internal accounting information is frequently inaccurate and misleading. Contemporaneously, many commentators believe that a significant gap has developed between management accounting practices

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and the normative literature (Choudhury, 1986; Edwards & Emmanuel, 1990; Otley, 1985; Scapens, 1985).

This critical commentary has sparked increased interest in the state of management accounting practice. In the last few years, surveys of management accounting practice have become fairly commonplace, e.g., Bright, Davies, Downes, and Sweeting (1992) and Drury and Tayles (1994) in the United Kingdom (UK); Cohen and Paquette (1991), Emore and Ness (1991), Green and Amenkhienan (1992) in the United States; Joye and Blayney (1990) in Australia; Yoshikawa, Innes, and Mitchell (1989) in Japan; Ask and Ax (1992) in Sweden. Few research studies appraise international differences in product-costing practices (e.g., Blayney & Yokoyama, 1991; Kim & Song, 1990), however. Such an international comparison provides the basis for gauging the relative sophistication of costing practices employed in countries, thereby facilitating a consideration of whether the theory–practice time lag is common across countries. Using a single survey instrument as the basis of data collection, this paper compares UK and New Zealand (NZ) product-costing practices. The analysis has been conducted primarily from a NZ perspective. The specific research aims are twofold:

- (i) to gauge and analyse product-costing practices employed in NZ;
- (ii) to compare such practices with those in the UK using a more rigorous research design than that employed in prior work offering cross-country comparative comment.

While concerns over the state of management accounting practice may have provided the impetus for the recent growth of empirical enquires into practice, a study concerned with NZ product-costing practices appears to be particularly timely. In the recent past, there has been considerable change in the NZ commercial and economic environment. Since 1984, the government has freed prices, wages and interest rates, floated the exchange rate, progressively removed tariffs and subsidies, deregulated the financial system, reduced income tax rates, and encouraged overseas investment in NZ. Spicer, Bowman, Emmanuel, and Hunt (1991) see these NZ developments as more radical than in any other industrialized country. There is a widely held view that these changes have engendered a more competitive commercial environment in NZ. One might expect this development to be manifested by greater deployment of some of the more recently promoted, sophisticated approaches to product costing such as activity-based costing (ABC).

The remainder of the paper is organized as follows. Section 2 provides an overview of the relevant literature. This is followed by Sections 3 and 4 that describe the research design and the survey's findings. Section 5 comments on the study's most significant findings.

2. Literary context of study

It is widely acknowledged that product costing is necessary for financial accounting purposes (to determine cost of goods sold and inventory), and for management accounting purposes such as informing pricing decisions (Govindarajan & Anthony, 1983; Mills, 1988), as well as decisions that derive from judgments of product profitability (Brignall, Fitzgerald,

Johnston, & Silvestro, 1991). The importance of product-costing accuracy can be considered in the light of these different roles. As Cooper and Kaplan (1991) note, for financial reporting purposes, all that is required of a costing system is that it achieves a reasonably accurate allocation of total costs between total inventory and cost of goods sold. Achievement of this objective, which relates to the accurate allocation of costs across time periods, does not, however, signify the achievement of an accurate allocation of costs across products. The objective of accurately allocating costs to products lies behind much of the management accountant's costing endeavors. An inaccurate allocation of costs between products can result in inappropriate pricing decisions, management ceasing production of a profitable product line, and failing to recognize unprofitable product lines. With growing levels of competition, the commercial costs of such shortcomings in managerial judgment can be expected to become increasingly unforgiving. As a consequence, there would appear to be a growing need for product-costing accuracy.

The achievement of product-costing accuracy is, however, becoming increasingly difficult. The technology of production has evolved rapidly and in a manner that carries significant implications for product-costing methods. Technological developments have resulted in machine capital constituting an increasing proportion of total cost and direct labor constituting a declining proportion of total cost. This development signifies that overheads constitute an increasing proportion of total cost (Cooper & Kaplan, 1991). As a consequence of the declining significance of processing costs (especially labor) in the overall cost structure, using volume-related processing costs such as labor as the basis for allocating overhead costs is becoming increasingly inappropriate. Exacerbating this overhead-allocation problem is the increasing range of products to which the overhead cost is to be allocated. Stimulated by the increased competition referred to above, manufacturers are producing increasing numbers of product lines with a growing number of product features (Johnson & Kaplan, 1987).

It would thus appear that, at a time of increasing demands for product-costing accuracy, the pursuit of product-costing accuracy is becoming more, rather than less, challenging. This new context for product costing in the manufacturing industry can be contrasted to former times when there appears to have been a strong tendency for internal accounting systems to adopt rather than adapt financial accounting standards imposed on the external reporting process (Cooper, 1990; Johnson & Kaplan, 1987). The significant literature promoting the application of ABC can be seen to have arisen as a result of this changed manufacturing environment.

The recent expansion of interest in surveys of management accounting practice referred to above should be placed in the context of our knowledge of management accounting practice at the end of the 1980s. It was at this time that Anthony (1989) claimed that our knowledge of management accounting practices used is "abysmally poor." He criticized the extent to which unsupported claims such as "direct labor based overhead allocation is used by most companies" are made. Given the recent interest in this area of academic enquiry, it can no longer be said that our knowledge is "abysmally poor." In fact, we now have strong empirical evidence that in countries surveyed, direct labor is the predominant method for allocating overheads to products (Cohen & Paquette, 1991; Emore & Ness, 1991).

3. Survey design and sample

Drury and Tayles (1995) have attempted to comment on the findings of surveys of management accounting practice across countries. Other cross-country comparisons of management accounting practices can be found in widely used textbooks (e.g., Horngren, Foster, & Datar, 2000). Such comparisons are bound to suffer from several shortcomings, however. First, different survey instruments have been used in the surveys. It is to be expected that different product-costing issues have been addressed in the survey instruments and that there would be differences in the way that product-costing terminology is used. Second, even if the same product-costing issues were appraised, it would be a phenomenal coincidence if the constructs appraised were measured using the same measurement scales (e.g., Likert scales). The construction of such measurement scales necessitates the exercise of considerable subjective judgment and choice with respect to wording. Third, samples of companies surveyed across countries can be expected to differ with respect to size and type of company surveyed. Fourth, response rates vary across surveys giving rise to the potential of varying degrees of nonresponse in the data considered for each country. These shortcomings signify that limited inferences can be drawn when conducting such cross-country comparisons.

This study addresses these shortcomings by:

- (i) using the same survey instrument,
- (ii) comparing NZ and UK companies matched by size,
- (iii) minimizing the potential of nonresponse bias.

As the UK companies sampled tended to be larger than the NZ companies, the comparison of product costing in the two countries has been conducted at two levels:

- (a) large UK manufacturers and large NZ manufacturers,
- (b) a subsample of those companies drawn from both countries satisfying a particular size criterion.

The UK was adopted as the country against which to benchmark for two reasons. First, the broadly similar professional and academic accounting training in the two countries would suggest that the UK provides a reasonable basis for comparison. Second and more pragmatically, here was an opportunity to extend an established survey instrument and database, hitherto used exclusively in an appraisal of UK management accounting, to NZ. Drury, Braund, Osborne, and Tayles (1993) received a research grant from the Chartered Association of Certified Accountants to develop and administer a survey concerned with management accounting practices in the UK. The extensive nature of the survey instrument and the quality of the data collected in the UK provided an excellent opportunity for benchmarking NZ management accounting practices to those employed in an overseas country.

Considerable care has been taken to replicate, as far as possible, the administration procedures employed by Drury et al. (1993). Drury et al. developed an initial sampling frame comprising all companies identified in a CD-ROM database as having substantial manufac-

Table 1
Summary of survey replies

	Questionnaires mailed	Responses	Unadjusted response rate (%)
NZ	268	85	32
UK	1269	303	24

The subsample of companies matched on a size criterion comprises 48 NZ companies and 47 UK companies.

turing, producing, or processing activities and also a 5-year average sales turnover exceeding £10 million. This sampling frame was then refined to include operating divisions and plants with distinct activities and where the divisional accountant was a qualified member of one of the main accounting bodies. This refined sampling process resulted in the identification of 1269 accountants, of whom 303 responded to the questionnaires mailed (an unadjusted response rate of 24%). The 303 respondents represent 260 separate companies, i.e., 35% of sampled companies.

The initial sample frame for the NZ sample comprises the top 500 manufacturing companies identified by the New Zealand Manufacturer's Association. Following Drury et al.'s lead, the criterion that all respondents hold a professional accounting designation was adopted. Two hundred and sixty-eight accountants holding a senior position at the divisional or plant level were mailed questionnaires, and only responses from qualified accountants were used in the analysis (of the 85 completed questionnaires returned, 65 were completed by qualified accountants). As part of an effort to secure a high response rate, the chief accountant of each company was initially contacted by telephone in order to obtain a commitment to participate in the study and also to verify mailing details. Data were collected in late 1995 and early 1996.

Table 1 summarizes the survey reply pattern in the two countries. In addition to the NZ respondents recorded in Table 1, nine further members of the sample responded indicating that they were unwilling to participate in the study. None of the quoted reasons for nonparticipation gave rise to a concern for nonresponse bias. As an indication of the sincerity with which respondents treated the survey, 43% of the UK respondents and 35% of the NZ

Table 2
Industrial classification of respondents

	NZ (%)	UK (%)
Chemicals and plastics	21	26
Engineering/industrial	20	27
Textiles	18	4
Food	13	9
Building	12	6
Paper and packaging	10	5
Electrical	3	15
Motor vehicles	3	6
Tobacco	0	1
Oil and gas	0	1
	<u>100</u>	<u>100</u>
<i>n</i>	61	303

respondents indicated a willingness to meet with the research team to discuss issues raised in the questionnaire.

Table 2 provides a breakdown of industrial groups represented in the two samples. A degree of commonality exists across the two countries as chemicals/plastics and engineering/industrial constitute the two largest industrial groupings in both samples. Differences in the industrial nature of the two samples are also evident, however, as, for example, textile companies comprise 18% of the NZ sample but only 4% of the UK sample, and electrical companies comprise 3% of the NZ sample and 15% of the UK sample. These differences should be borne in mind when interpreting the results of the study.

4. Survey results

As noted above, a two-tiered analysis of data collected has been made. The first level is based on the entire data set collected in the two countries, and the second is limited to companies of a similar size. Previous work (e.g., Drury & Tayles, 1994), provides a strong suggestion that company size is positively related to greater product-costing sophistication. As the bulk of the UK firms are larger than NZ firms, one would anticipate that a raw cross-country comparison that fails to take into account company-size differences would result in the potentially misleading finding of greater product-costing sophistication in the UK.

Size has been measured in terms of annual sales revenue. As the majority (80%) of the NZ sample comprise companies or business units with an annual sales turnover less than NZ\$75 million, this level of sales (£30 million¹) has been used as the qualifying upper threshold for inclusion in the matched subsamples. In addition, a minimum annual sales criterion has been employed. Four of the companies/business units sampled from NZ manufacturers had annual sales levels below the smallest sales level of companies/business units sampled from the UK manufacturers. These four companies/business units have not been included in the matched subsamples. Following these matching criteria, cross-country analysis of the subgroups matched by size is based on 48 observations drawn from NZ and 47 drawn from the UK.

Two types of statistical test have been employed when comparing across the two countries. Chi-square tests have been used to analyse differences for those questions that called for the provision of categorically defined data, and the Mann–Whitney *U* statistic has been computed for data provided in connection with questions requiring a response on a five-point ordinal-text scale. In addition, the Wilcoxon matched pairs test has been used to highlight significantly different, within-country, levels of usage of particular costing activities. This within-country test has been only conducted at the entire sample levels, as the matched subsampling has been conducted for the sole purpose of facilitating improved cross-country comparative analyses.

The results of the investigations conducted are presented under the following seven headings: (1) cost information used for decision-making, (2) plant-wide overhead rates, (3)

¹ The exchange rate at the time of the study approximated to NZ\$2.5 to £1.

Table 3
Costs used for decision-making purposes (e.g., product mix/make-or-buy decisions)

	Country	Cases	Mean	S.D.	Mann–Whitney <i>U</i>
<i>Panel A: Entire sample</i>					
Variable/incremental manufacturing cost	NZ	52	2.84	1.243	4780**
	UK	275	3.55 ^{††}	1.077	
Total manufacturing cost as used for stock valuation	NZ	54	3.85 [†]	1.053	5303**
	UK	275	3.22	1.245	
Total variable/incremental cost (including nonmanufacturing variable costs)	NZ	49	2.40	1.153	4951**
	UK	268	2.94	1.207	
Total cost (including fixed nonmanufacturing costs)	NZ	52	2.92	1.453	6812
	UK	273	2.81	1.214	
<i>Panel B: Matched samples</i>					
Variable/incremental manufacturing cost	NZ	40	2.70	1.244	604**
	UK	42	3.35	1.265	
Total manufacturing cost as used for stock valuation	NZ	42	3.73	1.106	781
	UK	45	3.35	1.246	
Total variable/incremental cost (including nonmanufacturing variable costs)	NZ	39	2.38	1.184	751.5
	UK	42	2.21	1.240	
Total cost (including fixed nonmanufacturing costs)	NZ	41	2.90	1.446	759
	UK	42	2.59	1.380	

** Difference between UK and NZ significant at 5% level.

[†] Total manufacturing cost used statistically significantly more than any other cost classification in NZ (Wilcoxon matched pairs: $P < .01$).

^{††} Variable/incremental manufacturing cost used statistically significantly more than any other cost classification in the UK (Wilcoxon matched pairs: $P < .01$).

use of direct labor as basis for overhead recovery, (4) treatment of service/support department costs, (5) treatment of nonmanufacturing costs, (6) volume base used in determining the allocation rate for fixed overheads, and (7) ABC.

4.1. Cost information used for decision-making

Table 3 provides an overview of findings concerning the degree to which four distinct cost classifications are used for decision-making purposes (e.g., product mix/make-or-buy decisions). Table 4 can be seen to complement Table 3, as it presents a summary of findings concerned with the extent to which the same four cost classifications are used for pricing decisions. For each of the four cost classifications, respondents indicated their degree of usage on a five-point scale where *never*, *rarely*, *sometimes*, *often*, and *always* corresponded to 1–5, respectively.²

² All questionnaire items referred to in this study are presented as an Appendix in Drury and Tayles (1994).

Table 4
Product costs used for pricing decisions

	Country	Cases	Mean	S.D.	Mann–Whitney <i>U</i>
<i>Panel A: Entire sample</i>					
Variable manufacturing cost	NZ	47	2.95	1.459	4867***
	UK	244	3.32	1.323	
Total manufacturing cost as used for stock valuation	NZ	54	3.88 [†]	1.269	5284**
	UK	245	3.42	1.384	
Total variable cost (including nonmanufacturing variable costs)	NZ	46	2.41	1.203	4407***
	UK	232	2.80	1.313	
Total cost (including fixed nonmanufacturing costs)	NZ	50	3.32	1.504	6029
	UK	253	3.19	1.486	
<i>Panel B: Matched samples</i>					
Variable manufacturing cost	NZ	36	2.86	1.477	706
	UK	42	3.00	1.379	
Total manufacturing cost as used for stock valuation	NZ	43	3.88	1.366	761
	UK	40	3.62	1.427	
Total variable cost (including nonmanufacturing variable costs)	NZ	37	2.43	1.281	649
	UK	39	2.20	1.218	
Total cost (including fixed nonmanufacturing costs)	NZ	41	3.34	1.559	775
	UK	42	3.04	1.710	

** Difference between UK and NZ significant at 5% level.

*** Difference between UK and NZ significant at 10% level.

[†] Total manufacturing cost used statistically significantly more than variable manufacturing cost in NZ (Wilcoxon matched pairs: $P < .01$).

In light of the widely held view that fixed costs should be treated as irrelevant to short-term decision-making and that variable costing should be used,³ it is noteworthy that in NZ total manufacturing cost is the most extensively used cost information for decision-making (Wilcoxon matched pairs; $P < .01$), and it is used more extensively than in the UK ($P < .05$). In the UK, the most extensively used costing classification for decision-making purposes is variable/incremental manufacturing cost (Wilcoxon matched pairs; $P < .01$), and this is used significantly more than in NZ ($P < .05$). In addition, variable/incremental cost (including nonmanufacturing variable costs) is used significantly more in the UK ($P < .05$). The significance of these cross-country differences should be tempered, however, by the fact that when the countries are compared at the matched-samples level, the only significant difference concerns greater use of variable/incremental manufacturing cost for decision-making in the UK.

³ A widely held tenet of the normative literature concerns the view that cost data relevant to decisions made in a short-term context should exclude fixed costs, which are assumed to remain constant whatever the decision outcome, and that variable (or incremental) costs represent the most appropriate cost information for short-run decision making (e.g., Barfield et al., 1997, pp. 530–532).

A similar picture emerges with respect to cost information used for pricing purposes (see Table 4). In NZ, total manufacturing cost is used significantly more than variable costing for pricing purposes (Wilcoxon matched pairs; $P < .01$). Total manufacturing cost is also used significantly more and variable costing used significantly less for pricing purposes in NZ compared to the UK. No significant cross-country differences appear, however, when the two matched samples are compared. For this reason, it would be inappropriate to suggest a systematic difference between the UK and NZ with respect to costing for pricing decisions, as the differences noted in Panel A of Table 4 appear to be partially attributable to the differences in average company size across the two countries.

4.2. Plant-wide overhead rates

Data were collected to determine the proportion of companies using:

- one plant-wide overhead rate,
- separate overhead rates for each department in the plant,
- separate overhead rates for each work center within a department.

While product costs derived from single plant-wide rates might be acceptable for valuing stock, they can be deficient if the product cost information is used for decision-making (Cooper & Kaplan, 1991; Drury & Tayles, 1995).

Table 5 presents the distribution of data with respect to the number of separate cost-center overhead absorption rates employed in the typical manufacturing plant. More than 50% of NZ companies surveyed employ only one plant-wide overhead absorption rate. This is significantly higher than the proportion of UK companies using one overhead absorption rate ($P < .01$) and can be viewed as of concern if these NZ companies have multiple products that pass through different production centers, and the products consume overhead resources in differing proportions (see Barfield, Raiborn, & Kinney, 1997, p.165). For the matched

Table 5
Number of separate cost-center overhead absorption rates employed in typical manufacturing plant

	One overhead rate (%)	Separate rate for each department (%)	Separate rate for each center within a department (%)
<i>Entire sample</i>			
NZ ($n = 62$)	52 *	21	27***
UK ($n = 279$)	28	32	40
<i>Matched samples</i>			
NZ ($n = 48$)	46	23 **	31
UK ($n = 40$)	32	45	23

* Statistically significant cross-country difference (chi-square; $P < .01$).

** Statistically significant cross-country difference (chi-square; $P < .05$).

*** Statistically significant cross-country difference (chi-square; $P < .1$).

samples, significantly more UK manufacturers use a separate absorption rate for each department ($P < .05$).

Further analysis was conducted to ascertain the extent to which multiproduct companies use a single plant rate and the extent to which these companies use the cost information for decision-making (e.g., product mix/make-or-buy decisions) or for pricing. The questionnaire called for the respondent to indicate the number of separate product ranges produced in their company's typical manufacturing plant. In the analysis conducted below, a company has been classified as "multiproduct" if its typical manufacturing plant produces more than one product range.

It has been found that 48% of NZ multiproduct companies employ a single plant-wide rate (the equivalent figure for the UK sample is 26%; for the subsamples controlled for company size, the figures are 42% and 32%, respectively). Of the NZ multiproduct companies employing a single plant-wide rate, 85% use total manufacturing costs in product mix and make-or-buy decisions and 80% for pricing. In the UK, 52% of multiple product companies that use a single plant-wide rate use total manufacturing costs in decision-making and pricing. The problem of potential inaccurate overhead cost allocations arising due to the use of a single plant-wide rate would be mitigated if manufacturing overhead costs constituted a small percentage of total costs. Further analysis has revealed, however, that of this multiproduct subset of companies, 45% of the NZ sample and 59% of the UK sample have manufacturing overhead costs that constitute 20% or more of total manufacturing costs.

4.3. Use of direct labor as basis for overhead recovery

It is widely acknowledged that more accurate product costing can result from using more than one overhead allocation basis in a manner that allocates each category of overhead on the basis of the primary factor that drives the particular overhead cost (e.g., see Horngren et al., 2000, p. 117; Rayburn, 1993, p. 105). For example, direct labor might be used to allocate those overhead costs that arise due to the presence of labor (e.g., training), and machine hours might be used to allocate those costs arising due to the presence of machinery (e.g., machine depreciation). As Horngren et al. (2000, p. 117) point out, using more than one basis to allocate overheads is justifiable so long as the benefits derived from increased costing accuracy exceed the increased costs associated with maintaining a more complex costing system.

As a result of the growing capital intensity of production and the relative decline in labor costs, there has been increased criticism of the use of direct labor (rather than other bases such as machine hours) as the basis for overhead recovery. Drury (1992) explains this view in the following way:

In machine-paced manufacturing environments such as automated plants, output is determined by machines, and workers are, in effect, machine tenders and the speed of production is determined by computer specialists and industrial engineers. . . If the direct labour content is low then overheads bear little relationship to direct labour hours, and the direct labour hour method of recovering overheads is inappropriate. Instead, overheads should be recovered on the basis of machine processing time, with a separate machine hour rate established for each machine or group of machines. (p. 85)

Table 6
Breakdown of total manufacturing cost

	Entire sample (%)		Matched samples (%)	
	NZ	UK	NZ	UK
Direct material	60	61	62	63
Direct labor	19	16	17	12
Manufacturing overhead	<u>21</u>	<u>23</u>	<u>21</u>	<u>25</u>
	100	100	100	100

No statistically significant cross-country differences noted in this table.

Table 6 highlights the significance of direct labor cost relative to direct material and manufacturing overhead. From this table, it can be seen that for both countries, direct labor constitutes a smaller proportion of total manufacturing cost compared to direct materials and manufacturing overhead. Following Drury's (1992) rationale cited above, it might be expected that this low significance of direct labor would result in the sample attaching relatively low importance to direct labor as a basis for overhead allocation. From Table 7, it is apparent that direct labor continues to be used extensively as a basis for overhead allocation, however. In both countries, labor is used significantly more than any other basis for allocating manufacturing overhead ($P < .01$). It should be noted that these findings do not appear to be peculiar to NZ or the UK. Two independently conducted studies in the United States, Cohen and Paquette (1991) and Emore and Ness (1991) found a similar high degree of direct labor-based overhead allocation.

Table 7 is segregated into two panels. The first reports the overhead bases employed in automated production activities and the second relates to nonautomated production activities. From the first panel, it is evident that direct labor is used as a basis for overhead allocation by around 80% of the responding companies. With respect to nonautomated production activities, the percentage of NZ companies using direct labor is significantly less than for UK companies at the entire sample level of analysis ($P < .05$).⁴ The matched samples cross-country comparison of overhead bases used in both the automated and nonautomated production environments reveals no statistically significant differences.

4.4. Treatment of service/support department costs

The traditional method for allocating service/support department costs that is generally espoused in the normative literature involves allocating costs first to production departments (based on usage) and then to products, using an appropriate cost driver that reflects how products consume these service/support resources. This approach signifies that in many situations service/support department costs will be merged with manufacturing overheads and

⁴ The percentage of NZ companies using direct labor as a basis for overhead allocation appears lower for nonautomated production activities compared to automated activities. This observation is surprising as it is to be expected that direct labor will constitute a more significant cost driver in a nonautomated facility compared to an automated facility.

Table 7
Types of manufacturing overhead rates used

	Entire sample (%)		Matched samples (%)	
	NZ	UK	NZ	UK
<i>Panel A: Automated production activities</i>				
Direct labor	84 [†]	78 [†]	79	81
Materials consumed	44	40	41	40
Machine hours	53	60	53	50
Units of output	47	55	45	48
ABC	10	15	11	5
<i>Panel B: Nonautomated production activities</i>				
Direct labor	68 ^{**†}	83 [†]	64	76
Materials consumed	27	41	27	25
Machine hours	30	38	33	25
Units of output	32	44	33	40
ABC	11	11	12	5

** Statistically significant cross-country difference (chi-square; $P < .05$).

[†] Used statistically significantly more than any other overhead rates (chi-square; $P < .01$); test conducted at entire sample level only.

allocated on a volume basis such as labor hours or machine hours (see Table 7). Arising out of a concern that in many cases service department costs may be unrelated to direct labor or machine hours, Drury (1989) and Shank and Govindarajan (1988) argue that more accurate product costing may be achieved if an independent support department rate based on the factor that gives rise to the support department cost is employed.

Respondents were asked what method of service department cost allocation was used in their companies. Table 8 summarizes responses to this question.

The two most popular service cost allocation methods used by NZ manufacturers are: (1) the two-stage process of allocating first to departments and then charging to products using departmental rates and (2) use of a single plant-wide rate. Only 9% of NZ manufacturers are

Table 8
Allocation of service/support department costs (e.g., material handling) to products

	Entire sample		Matched samples	
	NZ	UK	NZ	UK
Allocated to production departments then charged to products using departmental overhead rates	45%	45%	51%	49%
Costs of some service/support departments are charged to products using a separate overhead rate	9%**	21%	9%	9%
Charged to products within a single plant-wide rate	46%*	27%	40%	37%
Other	0%	7%	0%	5%
<i>n</i>	55	290	43	43

* Statistically significant cross-country difference (chi-square; $P < .01$).

** Statistically significant cross-country difference (chi-square; $P < .05$).

using what Drury (1989) and Shank and Govindarajan (1988) see to be the preferred method of service department cost allocation and this is significantly less than the 21% of UK manufacturers using this method ($P < .05$). This apparent difference appears to be more related to company size, however, than any systematic difference between the two countries. When the two countries are compared based on the matched subsamples, one is struck more by the similarity rather than the differences of the findings.

4.5. Treatment of nonmanufacturing costs

Actual practices adopted with respect to the allocation of nonmanufacturing costs to products have received little attention in the literature. This might be because financial accounting standards prohibit the allocation of nonmanufacturing costs to products and also because they are irrelevant to many decision-making scenarios. Such costs are relevant to pricing- and product-mix decisions, however (Drury, 1992). The recent literature concerned with ABC has shown how improved product-costing accuracy can be attained through careful identification of nonmanufacturing overhead cost drivers (e.g., Cooper & Kaplan, 1992).

Table 9 reports the bases used in the allocation of nonmanufacturing costs to products. More than a fifth of the companies in both countries do not attempt an allocation of nonmanufacturing costs to products (28% in NZ, 23% in UK). There appears to be a greater tendency not to allocate nonmanufacturing costs in NZ than in the UK (for the samples matched by size, the proportion of NZ nonallocators is significantly greater than the proportion of UK nonallocators; $P < .1$). The approach of not allocating costs where a significant degree of subjectivity would be called for in the allocation process is supported by Piper and Walley (1991).

Of those companies allocating nonmanufacturing costs to products, direct labor hours and manufacturing cost are the two most popular approaches in both countries. Both these approaches are subject to the criticism of being pure volume measures that may not capture the underlying factor that drives the nonmanufacturing costs. It is unlikely that a convincing rationale can be developed for allocating nonmanufacturing costs on these bases, and we are left to conclude that no allocation is preferable to an arbitrarily conducted allocation exercise. The fact that no NZ respondents indicated “other” for this question signifies that the ABC

Table 9
Methods used to allocate nonmanufacturing costs to products

	Entire sample		Matched samples	
	NZ	UK	NZ	UK
Manufacturing cost	26%	32%	28%	34%
Direct labor hours	38%	25%	35%	37%
Total selling price	8%	13%	7%	7%
Not allocated	28%	23%	30%***	15%
Other	0%	7%	0%	7%
<i>n</i>	50	249	40	41

*** Statistically significant cross-country difference (chi-square; $P < .1$).

philosophy has yet to make an impact on the allocation of nonmanufacturing overheads in NZ.

4.6. Volume base used in determining the allocation rate for fixed overheads

To facilitate the allocation of fixed overhead costs to products during an accounting period, in addition to identifying the cost driver to be used as the basis for the allocation, the estimated volume of that cost driver must also be determined in order to facilitate calculation of the overhead allocation rate. In traditional systems, the volume of the cost-driver figure used in calculation of the overhead allocation rate is the expected or budgeted level of activity (Cooper & Kaplan, 1991). Where budgeted volume changes from year to year, however, budgeted volume can lead to volatile fixed overhead unit costs. A more appropriate base is maximum practical annual capacity as this leads to consistent unit fixed overhead costs period to period, and also highlights to management the cost of unused capacity (this can, however, lead to undercosting, if full capacity is never achieved). Another preferred method is estimated long-run activity. This second method also achieves consistent unit fixed overhead costs and highlights some excess capacity. For a fuller discussion of these alternative approaches, refer to Cooper and Kaplan (1992).

Table 10 presents the results of a question that asked respondents to indicate the basis for calculating the denominator that is used in determining the fixed overhead allocation rate. Only 2% of NZ companies and 6% of the UK companies used maximum practical capacity as the basis for volume in the denominator. Estimated long-run activity was used by a few more of the sampled manufacturers, but still percentages are less than 15% (13% in NZ, 11% in the UK). The most widely used method is budgeted annual activity (60% in NZ, 66% in the UK). As noted above, this method can potentially result in misleading product costs. Actual activity, however, the least preferred of the four approaches to denominator determination, ranks second in terms of level of usage in both countries. The actual activity volume denominator has been criticized on the grounds that costs derived can be even more volatile and misleading than those derived when a budgeted volume rate is employed in the denominator (Cooper & Kaplan, 1991).

Table 10
Denominator used in calculating fixed overhead allocation rate

	Entire sample		Matched samples	
	NZ	UK	NZ	UK
Maximum practical capacity	2%	6%	3%	3%
Estimated long-run activity	13%	11%	10%	6%
Budgeted annual activity	60%	66%	66%	71%
Actual activity	25%***	13%	21%	11%
Other	0%	4%	0%	9%
<i>n</i>	52	258	48	35

*** Statistically significant cross-country difference (chi-square; $P < .1$).

An overriding concern arising from this phase of the analysis is the fact that a large percentage of companies in NZ and the UK (85% and 79%, respectively) are using denominator bases that carry the potential to negatively impact on product-costing accuracy (i.e., actual or budgeted activity levels).

4.7. Activity-based costing

There are several key differences between traditional costing approaches and ABC. ABC focuses on the allocation of costs to products in accordance with the activities attributable to each product. Traditional costing allocates costs to departments and then to products, rather than focusing on activities that consume costs. Traditional overhead allocation techniques are based on volume-related cost drivers, whereas ABC extends the number of allocation bases to include nonvolume drivers. As noted earlier, increased product variety and the deployment of technologies that have resulted in a growth of overhead costs that are unrelated to volume have increased the potential of traditional costing methods generating misleading information.

The questionnaire asked respondents to indicate which of five statements reflected the status of ABC in their companies. Results emanating from this question are presented in Table 11. At the time of the survey, just less than 60% of the NZ companies had held discussions concerned with introducing ABC. Thirty-two percent had not progressed beyond considering whether or not to use the method and only 17% indicated having either introduced or an intention to introduce ABC.

At the matched samples level of analysis, it appears that NZ is more advanced in terms of consideration and implementation of ABC. A greater proportion of UK firms in the matched sample have held no discussions on introducing ABC ($P < .1$). In addition, 17% of the NZ matched sample intend to use, or have used ABC, as opposed to just 2% of the UK matched sample. It is also noteworthy that a size effect appears to be in evidence. Only 44% of the full sample of UK firms have held no discussions on introducing ABC, compared with 63% of the matched sample (i.e., smaller) UK firms. This finding is consistent with previous research suggesting more sophisticated approaches to management accounting in larger firms (Bruns & Waterhouse, 1975; Drury & Tayles, 1994; Merchant, 1981).

Table 11
Activity-based costing usage

	Entire sample		Matched sample	
	NZ	UK	NZ	UK
No discussions on introducing ABC	41%	44%	44%***	63%
Decided not to introduce ABC	10%	5%	9%	7%
Considering ABC	32%	38%	30%	28%
Intending to use ABC	12%	9%	15%***	2%
ABC introduced	5%	4%	2%	0%
<i>n</i>	61	289	46	46

*** Statistically significant cross-country difference (chi-square; $P < .1$).

5. Conclusion

This paper has presented the results of a comparison of product-costing practices employed by NZ manufacturers with those employed by UK manufacturers. Many of the shortcomings that tend to undermine earlier cross-country comparative commentaries on management accounting practices have been overcome by using the same survey instrument in both countries and controlling for firm-size differences.

This study highlights the inappropriateness of drawing cross-country comparisons of survey data while failing to control for company size. From the data provided above, it is apparent that many of the cross-country differences appearing at the unmatched samples level of analysis disappear when the two samples are matched by size. From this observation, we conclude that inferences drawn from comparing cross-company data that fail to control for company size are overly simplistic and potentially highly misleading.⁵

When a holistic view is taken of the two matched samples, one is struck more by the degree of similarity rather than difference between the two countries' product-costing practices. While more differences are evident when the unmatched sample sets are considered, the only significant differences appearing when the matched subsamples are compared are as follows:

- Variable costing is used significantly more in the UK than in NZ for decision-making.
- NZ manufacturers have a lower tendency to employ separate overhead absorption rates across the typical manufacturing plant.
- NZ manufacturers have a greater tendency not to allocate nonmanufacturing costs to products.
- NZ manufacturers appear to be more advanced in terms of ABC as a greater proportion of manufacturers have held discussions on ABC and a greater proportion indicated an intention to use ABC.

⁵ As already noted, the desire to control for organization size stemmed from the view that some of the international differences in management accounting noted in earlier comparative works may be partially accounted for by differences in the average size of organizations sampled from the countries under study. An enduring finding of management accounting research indicates that larger firms use more sophisticated management accounting practices (Bruns & Waterhouse, 1975; Drury & Tayles, 1994; Merchant, 1981). As many cross-country differences apparent in the data reported herein disappear when the cross-country comparison is restricted to similarly sized companies, it appears that some of the cross-country differences are due to a size effect rather than some other systematic cross-country effect that is unrelated to company size. From this discussion, it should be evident that the desire to control for size should not be construed as an inference that size can capture cross-country cultural difference, however. The degree of similarity in NZ and UK product costing apparent from this study suggests that when size is controlled for, management accounting practices applied in Western economies may be more homogeneous than hitherto appreciated. In any subsequent international research designed to pursue this question further, it is important that organization size be controlled for in order that a distinction can be made between a simple cross-country size effect and a more profound cross-country effect arising from factors other than company size.

NZ's greater use of total costs in decision-making and the widespread use of a single plant-wide rate for overhead recovery suggest a lower level of product-costing sophistication compared to the UK. We are left to conclude that while the product-costing practices of the two countries are largely similar, there is a suggestion of marginally greater product-costing sophistication in the UK.

While it might be the case that there appears to be little systematic difference between costing practices in the two countries, we should nevertheless recognize the preponderance of potentially dysfunctional product-costing practices uncovered by this study. These include:

- High use of a single, plant-wide, overhead recovery rate;
- High use of total product costs for decision-making (whether this is a desirable product-costing practice depends on the time context of the decision to be made);
- High use of direct labor as a basis for overhead allocation;
- High use of arbitrary methods to allocate nonmanufacturing costs to products;
- High use of budgeted annual activity or actual activity as methods for calculating overhead allocation rates.

In connection with the finding that more than half the surveyed NZ companies employ only one plant-wide overhead rate, additional analysis was conducted in order to gain further appreciation of the potential for any resultant adverse managerial implications. Use of a single plant-wide overhead allocation rate will not lead to potentially misleading product cost information if a company produces one product or multiple products are produced using similar resources. That around half (48%) of NZ's multi-product manufacturers use a single plant-wide rate and that all of these companies use product costs that include overhead absorbed for decision-making and pricing is reason for some concern.

Another particularly noteworthy finding is NZ manufacturing's continuing reliance on direct labor as the primary basis for overhead allocation. For both automated and nonautomated manufacturers, direct labor has been found to be the most popular allocation basis. This represents further evidence of an apparent reluctance among Western world manufacturers to abandon costing practices that were more appropriate in former times.

This study provides further support to the growing evidence of a continuing lag between management accounting theory and practice. The strength of this evidence might now signify that a fruitful line of enquiry could result from moving the research agenda beyond "What practices are employed?" to focus on the question of "Why are product-costing practices lagging behind?" To pursue such a research question will necessitate a move away from the survey method and the deployment of more qualitative research methods involving the researcher in case studies, interviewing key players such as senior management and accounting systems designers. Of particular interest is the pursuit of questions such as "Why are firms continuing to use overhead allocation bases such as direct labor, rather than ABC approaches?"

Acknowledgments

Financial support for this study was provided by Manukau Institute of Technology, Auckland, New Zealand. The authors would like to thank the New Zealand Manufacturer's Association for providing a database of manufacturing companies, and the helpful comments of attendees at the 1997 BAA conference in Birmingham, England as well as attendees at a Griffith University seminar.

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Pergamon

The International Journal of Accounting
36 (2001) 349–374

**The
International
Journal of
Accounting**

Transfer pricing of intangible property Harmony and discord across five countries

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Abstract

Transnational corporations (TNCs) regard transfer pricing as the most important tax issue confronting them in the immediate future. Coupled with the increase in the number and type of cross-border transfers of intangible property, concerns arise about the adequacy of current transfer pricing regulations, and the harmony, or lack thereof, of such regulations when a TNC must address both host- and home-country tax authorities. This study of TNCs domiciled in Canada, Germany, Japan, the United Kingdom, and the United States (US) reveals a similarity in corporation approaches to valuing intangible property that transcends national borders. This is in stark contrast to current practices regarding the transfer of tangible goods, which vary by country, rather than by industry or nature of the transferred good. However, in many cases, this agreement is reached because TNCs are using transfer pricing methods for intangible transfers that do not follow the Organization for Economic Cooperation and Development (OECD) and/or US Internal Revenue Service (IRS) guidelines. © 2001 University of Illinois. All rights reserved.

Keywords: Transfer pricing; Intangible assets

1. Introduction

Transfer pricing remains a key international issue for multinational organisations and will be the *key issue* facing them over the next two years. (Ernst & Young, 1999, p. 4)

The transfer of intangible assets is viewed in some analyses as providing more positive impacts on a host's economy than capital transfers. (Government of Canada, 1996)

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The taxation of income from intangibles is perhaps the most important large case issue in the intercompany transfer pricing world today . . . In the case where a series of products are highly profitable, there is almost always some key intangible property involved. (Mentz & Carlisle, 1997, p. 50)

Given these declarations, the transfer pricing of intangible assets is a critical concern of transnational corporations (TNCs). Transfer pricing is both a business strategy and a tax issue because “decisions regarding products, location and supply-chain matters affect tax planning and tax compliance in both home and subsidiary countries” (Ernst & Young, 1997, p. 4). As more TNCs expand their foreign direct investment (FDI), conflicts among TNCs and the host and home countries’ transfer pricing legislation and the philosophies of their tax authorities increase. These differences may also encourage some TNCs to shift income from higher to lower tax jurisdictions to minimize their total tax burden and maximize profits. Consequences may include increased audits, litigation, double taxation, and penalty assessment, dampening a TNC’s enthusiasm for FDI, especially in developing countries and economies in transition. The need for increasing FDI in these lesser-developed countries and economies is so important that the United Nations (UN) is currently developing a multilateral framework on investment for such countries. Among the key issues included in this framework are the transfer pricing of tangible goods and intangible property (UNCTAD, 1999) and the transfer of technology, including intellectual property rights (not yet released).

The “gross income tax gap” in the United States (US) attributable to transfer pricing was in excess of US\$2.8 billion per year for the 1996–1998 period. How much of this is due to intangible property transfers is not clear. However, it was the perception of the US Congress about significant abuse involving the transfer pricing of US developed intangibles, which led to the major 1986 revision by the US Internal Revenue Service (IRS) of Section 482 vis-à-vis the transfer pricing of intangible property (Cole, 1999, Section 1.02). Continuing concerns with abuses and the magnitude of tax revenues associated with intangible property transfers led the Organization for Economic Cooperation and Development (OECD) to revise its transfer pricing guidelines in 1996 to include a chapter wholly devoted to intangible property issues (OECD, 1996).

Past and recent activity of the US Tax Court is one indicator of both the importance and the prevalence of the transfer pricing of intangible property in TNCs. Since the Section 482 revision in 1986, many Tax Court cases have involved very significant adjustments and penalties attributable to the improper transfer pricing and valuation of intangible property.¹ One estimate is that “nearly half of all adjustments proposed by the US IRS under Section 482 have involved the use or transfer of intangibles” (Cole, 1999, Section 8.01). In one recent and ongoing case, *DHL Corp. v. Commissioner*,² the TNC is appealing the assessment by the US IRS of US\$424.6 million in deficiencies and US\$992.2 million in allocations from trademark sales and royalties.

Another indicator is the number of advance pricing agreements (APAs) involving the negotiation of transfer prices for intangible property. The APA program allows TNCs to negotiate acceptable pricing methods for complex transactions for an extended time period to radically reduce the risks of audit and penalty assessment. Since the US IRS began its APA

program in 1992, 231 APAs have been completed, of which 64 deal with intangible property and 111 with the performance of services (IRS, 2000).

In this study, of the 262 TNCs using transfer pricing, 61% (159 TNCs) used it relative to intangible property. Of concern is how these 159 TNCs domiciled in different countries transfer intangibles across borders, and the effect of these transfers on their audit status, profitability, and relationship with host-country governments. Has the objective of globally acceptable transfer pricing methods been achieved, as called for by the OECD and the UN? Alternatively, are transfer pricing methods determined by TNC for economic and environmental attributes rather than by the desire for harmony and a globally accepted transfer pricing framework? Or, do the correlative objectives of tax minimization and profit maximization eclipse all other concerns?

The study has two objectives, the first being a primer on intangible property and existing transfer pricing legislation. The second objective is a two-pronged analysis to answer the questions previously raised. The transfers of intangibles by US TNCs to host and home subsidiaries are analyzed first. Then, US TNC transfer pricing behavior and characteristics are compared to those of Canadian, German, Japanese, and United Kingdom (UK) TNCs with subsidiaries in the US. Data for the study were collected through a mail survey of international and tax vice presidents of TNCs domiciled in the five countries of interest. Responses were elicited for both home- and host-country subsidiaries to allow for cross-border comparisons of intangible transfer pricing and performance evaluation practices.

There is much more agreement among TNCs and their transfer pricing methods for intangible property than their transfer pricing methods for tangible goods. Regardless of country, significant differences in TNC demographics, and differences in the types of intangibles transferred, there were no significant differences in the methods used to value intangible property in cross-border transfers. The logical assumption is that this harmony may be due in part to the relative concurrence of the OECD guidelines (followed by Canada, Germany, Japan, and the UK) with the US IRS regulations regarding the valuation of

¹ Some significant cases involving Section 482, transfer pricing, and intangible property include:

- *Ciba-Geigy Corp. v. Commissioner*, 85 TC 172 (1985), acquiesced 1987-2 CB 1 (1987).
- *G.D. Searle & Co. v. Commissioner*, 88 TC 252 (1987).
- *Eli Lilly & Co. v. Commissioner*, 856 F. 2nd 855 (1988), affirmed in part and reversed in part 856 F. 2nd 855 (7th Circuit 1988).
- *Bausch & Lomb, Inc. v. Commissioner*, 92 TC 525 (1989), affirmed 933 F. 2nd 1084 (2nd Circuit 1991).
- *Sundstrand Corp. v. Commissioner*, 96 TC 226 (1991).
- *Merck & Co. v. United States*, 24 Cl. Court 73 (1991), 91-2 USTC 456 (1991)
- *Perkin-Elmer Corp. v. Commissioner*, 66 TCM 634 (1993).
- *Seagate Technology Inc. v. Commissioner*, 96 TC 226 (1991), 102 TC 149 (1994).
- *Medieval Attractions N.V. v. Commissioner*, 72 TCM 924 (1996).
- *Compaq Computer Corp. v. Commissioner*, TCM 1999-220.
- *H Group Holding Inc. v. Commissioner*, TCM 1999-334.
- *DHL Corp. v. Commissioner* TCM 1998-1122, under appeal (see endnote 2).

² 76 TCM 1122 (1998), TCM 461 (1998), currently under appeal (Docket Numbers 99-71592 and 99-71580, 9th Circuit US Court of Appeals, 2000).

intangible property. With the recent issuance of the OECD's guidelines on cost sharing, it could be assumed that intangible transfer pricing practices may become even more aligned across countries.

However, upon further analysis, the harmony is deceptive. Fully 25% of the responding TNCs currently use a transfer pricing method to value intangible property that is not one of the methods specifically defined by either the OECD or the US IRS. Even if the guidelines and regulations were relaxed, 23% would still apply a nonspecified method. This study provides possible explanations for this divergence of the TNCs' practices with the theoretically preferred methods in the OECD guidelines and IRS regulations.

The results of this study show that TNCs differ much less across borders in the transfer pricing methods used to value intangible property compared to wide disparity in their transfer pricing choices when transferring tangible goods. However, although the TNCs agree on the methods to be used for intangible property, those methods may not be in accordance with those prescribed by the OECD guidelines or the US IRS regulations.

2. A comparison of transfer pricing regulations for intangibles

Intangibles are generally categorized using the following definitions set forth in IRC Section 482-4(b) and OECD (1996) guidelines:

1. Patent, invention, formula, process, design, or pattern.
2. Copyright, literary, musical, or artistic composition.
3. Trademark, trade name, or brand name.
4. Franchise, license, or contract.
5. Method program, system, procedure, campaign, survey, study, forecast, estimate, customer list, or technical data.
6. Other intellectual property not listed above.

The international standard for developing transfer prices for intangible property transferred between or among the parent TNC and its subsidiaries is the arm's-length principle. All transactions involving intracompany transfers of intangibles must be valued at a price that the TNC would have used when dealing with an external independent entity. One difficulty in the valuation of unique intangibles is the lack of comparable transfers from which to develop an arm's-length price. Another difficulty is the lack of incentives for TNC subsidiaries or affiliates "to engage in arm's-length negotiations and contract for an arm's-length royalty. Furthermore, the government lacks the information needed to determine the arm's-length royalty" (Halperin & Srinidhi, 1996, p. 62).

The OECD transfer pricing guidelines are voluntary and are meant to be used by countries either as the basis for their own transfer pricing regulations, or as the starting point from which their regulations are derived. Most countries use the OECD guidelines when developing transfer pricing regulations. The US regulations, while similar in many respects to the OECD guidelines, differ in several important procedural areas, and also dictate severe penalties for

noncompliance. While both the OECD and the US tax authority maintain that the arm's-length principle must be upheld when pricing intangible property, there is some disagreement on other issues. The following summarizes one substantial difference between the two approaches:

In the U.S., the burden of proof lies squarely with the taxpayer, who must prove that his prices are charged at arm's length. In Europe, conversely, the burden of proof lies with the tax administration, which must prove that the prices are not arm's length In the U.S., the relationship (of TNCs with their respective tax authorities) is often adversarial, where in Europe corporations are more used to working in close cooperation with tax authorities to arrive at compromise solutions The OECD guidelines concentrate on how prices are set (a subjective test that focuses on behavior), whereas U.S. regulations require an arm's-length result (an objective test that focuses on taxable income) The IRS's main concern is whether the tax base is correct. (Tax Analysts, 1996)

The burden-of-proof issue underlies the increasingly complex audits of host and home TNCs by the IRS, many of which lead to costly and time-consuming litigation in the US Tax Court.

2.1. Organization for Economic Cooperation and Development

The recently revised OECD (1996, 1997) guidelines for intangible property stress the use of a transaction-based arm's-length transfer pricing method³ such as the comparable uncontrolled price (CUP) and resale price methods. In cases where comparables are difficult to locate, profit-based methods such as the profit-split method and transactional net margin method (TNMM) are appropriate only as methods of last resort. The comparable profits method (CPM) is not acceptable. Pricing must take into account all relevant information available at the time of the transaction, including "all the developments that were reasonably foreseeable, without using hindsight" (VI-12). This is in stark contrast to US Section 482 requirements that all information up to the time of filing must be reflected in the transfer price.

2.2. Canada

Canadian transfer pricing is regulated by Section 69 of the Canadian Income Tax Act (enacted 1971), and interpreted by Information Circular 87-2, issued by Revenue Canada

³ These methods assume the arm's-length standard, so that the final transfer price between related (controlled) subsidiaries would have been the same if the transfers had been between unrelated (uncontrolled) entities. Generally, the CUP or comparable uncontrolled transaction (CUT) method uses the market price for the transferred good. Resale price is the price at which the transferred good would have been resold to an unrelated entity, less some gross profit percentage. The profit split divides profits between subsidiaries using some economically valid basis that approximates the division of profits that would have occurred had the subsidiaries been unrelated. The CPM uses profit measures (such as the return on assets or operating income to sales) to determine a return that would equal that realized by a comparable-independent enterprise. There is some debate over the arm's-length nature of CPM, in that it depends on profit comparisons rather than price and/or transaction comparisons and functional analysis. Consequently, the OECD recommends the TNMM, which examines the net profit margin that the TNC realizes from a controlled transaction. For a detailed review of transfer pricing methods and definitions, see US Section 482 (1994) and OECD (1995, 1996) guidelines.

(1987).⁴ Transfers of intangible property must be made at an arm's-length price, with the transaction-based CUP method emphatically preferred. Revenue Canada has proposed changes to the Income Tax Act to reflect many of the new OECD guidelines, and will allow the profit-split method to be used to value intangibles as an acceptable method, but only as a method of last resort (Revenue Canada, 1997). Other revisions include requirements for contemporaneous documentation of transfer pricing transactions, and the imposition of increased penalties for noncompliance (Coopers & Lybrand, 1997). The penalties do take into consideration reasonable effort by the TNC, which US regulations do not. These changes are currently under consideration by the Canadian Parliament as part of a larger tax package.

2.3. *Germany*

Germany's transfer pricing statutory provisions are contained in the Corporate Income Tax Act (Section 8), the Fiscal Code (Sections 39–42), the Income Tax Act (Section 4), and the International Tax Act (Section 1). The regulations are based on a flexible application of OECD guidelines, and are interpreted by the Administrative Principles on Income Allocation, Ordinance of the Federal Ministry of Finance (23 February 1983). Intangible pricing is strictly transactional, using the CUP method whenever possible. No subsequent adjustments based on profitability using the US' commensurate-with-income approach⁵ are allowed unless the arm's-length principle has been violated.

2.4. *Japan*

In Japan, Article 66-5 of the Special Taxation Measures Law (enacted 1 April 1986) and the National Tax Administration Agency (NTAA) address transfer pricing issues. They provide an effective administrative structure that lessens income manipulation by non-Japanese TNCs while minimizing the burden on the taxpayer and avoiding double taxation. The arm's-length basis is preferred, using CUP, resale price, or cost-plus. If none are appropriate only then are profit splits or TNMM acceptable.

2.5. *United Kingdom*

Transfer pricing regulations are set forth in Sections 770–773 of the 1988 Income and Corporation Taxes Act (Taxes Act, 1988). There are no detailed guidelines, and little case law or judicial decisions, with most disputes settled out of court. Section 770 specifies an arm's-length approach according to OECD guidelines, but the UK is subjective in its interpretation. Transactions are analyzed according to the available evidence in order to arrive at an arm's-

⁴ For a detailed discussion of Canadian regulations, see Gelardi and Wong (1996). A general review of current transfer pricing regulations of major trading nations is provided by Campos (1996).

⁵ The commensurate-with-income approach uses the principle of the arm's-length *return*, rather than the arm's-length *price*. Intangible property must be valued relative to the income derived from that intangible.

length price using CUP, resale price, cost-plus, and, as a last resort, profit-based methods. Section 773 defines the scope of transfer pricing transactions, but does not differentiate between tangible and intangible transfers in the application of transfer pricing methods, and does not permit commensurate-with-income approaches.

2.6. United States

Section 482 of the Internal Revenue Code includes guidance on allowable transfer pricing methods for intangible property using the arm's-length principle. Acceptable methods include CUTs, profit-split, CPM, and other methods not specified. TNMM, as defined by the OECD and as implemented by many countries, is not acceptable to the US tax authority. Any method may be chosen without prejudice as the "best method," but the TNC must be prepared to defend its choice with contemporaneous documentation if challenged by the tax authority. All information, including that after the transaction has occurred, must be taken into account when the final transfer price is calculated. OECD guidelines require only that all information up to the time of the transfer be incorporated into the transfer price.

Unique to the US regulations is the commensurate-with-income requirement. Section 482-4(a) states that the valuations of the transferred intangible property must "be commensurate with the income attributable to the intangible, i.e. a subsidiary may earn the same return as a competitor who does not have the intangible" (Halperin & Srinidhi, 1996, p. 63). The CUT method is based on the traditional arm's-length price comparison, while the CPM and profit-split approaches use the arm's-length return.

2.7. Cost-sharing arrangements

Cost-sharing (or cost contribution) arrangements allow TNCs to share the costs of development of an intangible property in proportion to the anticipated benefits experienced by each subsidiary from that intangible (US Section 482-7). This approach allows a TNC to alternatively value self-developed intangibles rather than using a licensing agreement, royalties, and compliance with the commensurate-with-income approach required by previously described arm's-length methods for pricing intangibles.

The OECD's (1997) cost-sharing guidelines are broader in their definition of a qualified cost-sharing arrangement than US Section 482, but are in agreement with costs being shared in proportion to the benefits received by the TNC entities. These guidelines reemphasize the arm's-length nature of any cost-sharing allocations, and the requirement of quantifiable prospective benefits in order to allow a subsidiary to participate in a cost-sharing arrangement.

3. Prior research

Transfer pricing research spans five decades, with the seminal article by Hirshleifer (1956) marking the beginning of both academic and corporate concern with transfer pricing issues. Research in this area has expanded from a strictly theoretical economic base addressing

domestic transfers of tangible property to include the transnational transfers of both tangible goods and intangible property; model building of transfer pricing systems; accounting, tax, and management issues related to transfer pricing; and practical studies of transnational corporate transfer pricing practices. For a review of the evolution of transfer pricing research, see Borkowski (1996a), Grabski (1985), Leitch and Barrett (1992), and Tang (1993).

From the wealth of transfer pricing research, there are few studies addressing transfer pricing vis-à-vis audit status and the transfer of intangible property. For fiscal year 1993, 12% (US\$99 million) of the proposed Section 482 income adjustments resulting from US IRS audits of TNCs were attributable specifically to royalties. For 1994, total income adjustments, including those due to intangible property, reached US\$3.5 billion (GAO, 1995). In its most recent study, the GAO (1999) found that 67% of non-US-owned TNCs, and 61% of US-owned TNCs, paid no US income taxes in 1995. This translates into annual losses in tax revenues of US\$35 billion attributable to transfer pricing practices by these TNCs (Nyhan, 1999).

There are few studies addressing either TNC audit experience or the transfer pricing of intangible property. Ernst & Young (1997) expanded their prior surveys on multinational transfer pricing practices to include intangible property and financial transfers, as well as tangible transfers. In their sample of 393 TNCs, home-country audits were experienced by 75% of Canadian TNCs, 63% of German TNCs, 66% of UK TNCs, and 63% of US TNCs. No responding Japanese TNCs were audited by the NTAA. Host-country audits affected 60% of Canadian TNCs, 63% of German TNCs, 100% of Japanese TNCs, 69% of UK TNCs, and 79% of US TNCs.

In their most recent study, Ernst & Young (1999) found that audit activity continued to be high, with the majority of TNCs in Canada (80%), Germany (79%), UK (71%) and the US (70%) experiencing either a home- or host-country audit. Japanese TNCs again were the exception: 48% were audited by the host country, while none were audited by their home-country tax authority, the NTAA. It is expected that 80% of the TNCs surveyed “will face a transfer pricing examination within the next two years” (Ernst & Young 1999, p. 32).

Borkowski (1996) found a different audit pattern across TNCs that transferred tangible goods and were domiciled in five countries. Fifty-six percent of US-based companies in the sample had undergone an IRS audit within the last five years; of TNCs with subsidiaries in the US, IRS audits affected 50% of UK-based TNCs, compared to TNCs based in Japan (18%), Germany (11%), and Canada (4%). Of US TNCs with subsidiaries in Canada, Germany, Japan, and the UK, 33% were audited by host-country governments. Only 29% of UK TNCs were audited by Inland Revenue, 14% of Canadian TNCs by Revenue Canada, 6% of German TNCs by the Ministry of Finance, and just 3% of Japanese TNCs by the NTAA.

Halperin and Srinidhi (1996) developed transfer pricing models that demonstrate that the current US Section 482 regulations for pricing-transferred intangible assets encourage TNCs to manipulate resource allocations and shift income. They suggest that the US government should reconsider the regulations given the trade-offs between the “potential increases in tax revenue and . . . the cost to the government of collecting additional information on the value of the intangible and the social cost of decreased production resulting” from the imposition of rules for intercompany royalties for tax purposes (p. 69).

In its first study, which included both tangible and intangible transfer pricing practices by TNCs, Ernst & Young (1997) found that 35% of the 393 responding TNCs from 12 countries used the CUP/CUT method to price-transferred intangible property, 17% used one of the three profit-based methods (CPM, TNMM, and profit split), and the remaining 48% used some other methods. The follow-up study for intangible transfers (Ernst & Young 1999) found the usage of CUT/CUP dropping to 28%, profit-based methods dropping to 15%, and the usage of other methods increasing to 57%.

3.1. *Variable selection and hypotheses*

Given the lack of research on *intangible* transfer pricing methods used in practice, and how they are chosen by TNCs, prior studies on *tangible* transfer pricing practices (Borkowski, 1997, 1997a; Tang 1993; and others) were used as the model for this study's survey, many of the variables, and hypotheses. In order to assess the impact of organizational, environmental, and financial characteristics on transfer pricing method choice, data were collected for each respondent TNC, either archivally or through the survey instrument, as shown in Table 1. The survey questions are included in Appendix A.

Given the lack of research on intangible transfers, generally, variables were included if they had been associated with tangible transfer pricing choice either in prior studies or theoretically in the literature (Borkowski, 1996a; Tang, 1993).

Organizational variables included types of intangible property transferred, size (sales measured in US dollars), industry, and internal criteria considered when choosing a transfer pricing method. Size and industry are factors that have been traditionally associated with the choice of a tangible transfer pricing method (Borkowski, 1996a), but with contradictory findings. For example: larger firms use cost-based methods (Benvignati, 1985); cost-based firms are smaller (Borkowski, 1992); no relationship (Tang, 1979). With industry as a factor, similar conflicts exist. While certain internal criteria, such as performance evaluation and maximization of after-tax profit, have been consistently correlated with transfer pricing method choice (for example, Borkowski, 1997, 1997a; Tang, 1993), others have yielded inconsistent results, or have not been consistently included in the existing research. Performance evaluation measures used for host- and home-country managers were also assessed, given the importance attached to performance evaluation when choosing a transfer price for tangible goods in prior studies (Borkowski, 1993; Klassen, Lang, & Wolfson, 1993).

Among the environmental variables were the economic stability of the TNC, economic stability of the subsidiary, relationship between the TNC and the host government, audit history with host and home tax authorities, and external criteria considered when choosing a transfer pricing method (Borkowski, 1997, 1997a; Tang, 1993). Financial variables (income, return on equity (ROE), return on assets (ROA), and return on sales (ROS)) were included due to prior studies finding profit differentials across borders, which have been linked to transfer pricing (Hufbauer & van Rooij, 1992; Jacob, 1996). Data on the actual transfer pricing method used, and the TNC's preferred method if not constrained by regulations, were also collected.

Table 1

Source of survey variables considered to have potential effect on transfer pricing choice

Organizational variables

Size (sales) by TNC (archival)

Industry (archival)

Performance evaluation criteria by US and non-US managers (Q7)

- Nonincome measures

- Segment profit

- Other profit measures

- Innovation measures

Transfer pricing method criteria — internal (Q8)

- Practical concerns (ease/cost)

- Usefulness in decision making

- Usefulness in performance evaluation

Type of intangible property transferred (Q3a)

Environmental variables

Economic stability — TNC and subsidiary (Q1)

TNC/subsidiary government relations (Q2)

Prior IRS/other tax authority audit experience (Q5, Q6)

Transfer pricing method criteria — external (Q8)

- Tax and trade regulations

- Other transnational concerns

TNC practices to counter effects of transfer pricing method (Q4)

Financial variables

Return on equity (archival)

Return on assets (archival)

Return on sales (archival)

Income by parent (archival)

Q# refers to the survey questions presented in Appendix A.

Given the similarity of the OECD guidelines and the US regulations, the following hypotheses (stated in the null) are tested:

Hypothesis 1a: There is no difference in transfer pricing methods used to transfer intangible property by the home country of the TNC.

Hypothesis 1b: There is no difference in transfer pricing methods used to transfer intangible property between TNCs in OECD countries and TNCs based in the US.

Hypothesis 2: The choice of an intangible transfer pricing method is not affected by organizational, environmental, or financial characteristics of the TNC.

If transfer pricing methods are related to the location of the parent TNCs, then the TNC's audit status with their home and host tax authorities may also be related (Borkowski, 1996; Ernst & Young, 1997, 1999; GAO, 1995). If transfer pricing methods are chosen to satisfy tax authority requirements, they may distort a TNC's true operations and cause the TNC to

undertake a course of action to address these distortions (Borkowski, 1992; Tang, 1981). The final two hypotheses assess audit status, TNC location, and secondary actions to address the effects of transfer pricing if chosen to satisfy tax requirements:

Hypothesis 3: Tax authority/IRS audit status is not affected by the location of the parent TNC.

Hypothesis 4: Actions taken to counter effects of transfer pricing do not differ by the home country of the TNC.

4. Methodology, analysis, and interpretation

US-based TNCs are included in the sample if they have at least one subsidiary in Canada, Germany, Japan, or the UK. The listed TNC must also be included in the 1996 *Fortune 500*, *Business Week 1000*, or the *Directory of Corporate Affiliates*. TNCs based in Canada are part of the sample if they have at least one US subsidiary and are part of the 1996 *Canadian Business Corporate 500* or the *Directory of Corporate Affiliates*. TNCs whose home countries are Germany, Japan, and the UK were included if they have at least one US subsidiary and were listed in the *Directory of Corporate Affiliates*. The final sample included TNCs from industries previously identified in prior studies as likely to use transfer pricing.

Initial and follow-up mailings were sent to the international or tax vice presidents of the 1288 TNCs, which met the aforementioned criteria. Of the 551 TNCs responding (for a 43% response rate), 265 TNCs used transfer pricing for tangible goods and/or intangible property. Of those 265 TNCs, 159 had cross-border transfers of intangible property, and comprise the final sample. There were no significant differences between respondents and nonrespondents in size or industry (Table 2).

Many of the survey questions elicited responses based on a five-point Likert scale. Given the categorical nature of much of the data collected in this study, the nonparametric Kruskal–Wallis (K–W) one-way analysis of variance by ranks was used for the analyses. The K–W test is appropriate because most of the analyses compared responses by country, so that the data were in five independent samples of unequal size.⁶

Two separate factor analyses were performed to discover any relationships among 45 items concerning performance evaluation and transfer pricing choice. Four performance evaluation factors were derived from a factor analysis of 14 items used to evaluate a TNC's subsidiary managers (see Question 7 in Appendix A). Responses to these items were collected separately for managers in the TNC's home-country subsidiaries and for managers in the TNC's host-country subsidiaries. This factor analysis yielded four organizational evaluation dimensions: nonincome criteria (PE1), financial ratios (PE2), subsidiary income (PE3), and innovation (PE4), for both host and home managers. Similarly, there were 31 items relevant to the TNC's

⁶ Siegel and Castellan (1988) state that “when there are more than $k=3$ groups, and when the number of observations in each group exceeds five, the sampling distribution of K–W is well approximated by the chi-square distribution with $df=k-1$ ” (p. 208). This study has $k=5$ groups, with all groups exceeding five observations.

Table 2
Composition of the final sample of TNCs in this study

	TNCs in original mailing	Total responses	Response rate (%)	Use TP for intangibles	Use TP for tangibles only	Do not use TP	Refused to answer
Canada	126	71	56	10	20	41	–
Germany	113	45	40	8	10	25	2
Japan	241	105	44	18	21	64	2
UK	121	38	31	10	4	22	2
US	687	292	42	113	51	104	24
Total	1288	551	43	159	106	256	30
<i>Composition of US (aggregate) sample by location of subsidiary</i>							
US (Canada)	261	106	41	45	18	38	5
US (Germany)	132	58	44	24	8	20	6
US (Japan)	126	56	44	17	12	20	7
US (UK)	168	72	43	27	13	26	6
Total	687	292	42	113	51	104	24

choice of a transfer pricing method (see Question 8 in Appendix A). A factor analysis loaded on three internal organizational factors (ease and cost (TPC1), performance evaluation (TPC2), and decision making (TPC3)) and two external environmental factors (tax and trade (TPC4) and global issues (TPC5)).

Selected demographic information about the TNCs in the final sample is presented in Table 3. The sample differs significantly by TNC home country in size (measured by sales in US dollars), ROE, and subsidiary–government relations. Canadian TNCs are considerably smaller and poorer performers than the rest of the sample, while subsidiaries of Japanese TNCs have less favorable relationships with the host US government. This is mirrored in the poorer relationships of US subsidiaries with the host Japanese government.

An analysis of Table 4 reveals that patents and trademarks accounted for almost two-thirds of the intangible assets transferred. Trademarks were disproportionately transferred by the US relative to other countries and to other types of intangibles.

4.1. Hypotheses 1a and 1b

Although there are many parallels between the OECD guidelines and US regulations regarding transfer pricing, prior comparisons of transfer pricing methods for tangible goods have shown differences among TNCs based in different countries (Borkowski, 1997, 1997a; Tang, 1981). In this study, it was assumed that the transfer pricing methods chosen for intangible property would also differ. As shown in Table 5, however, Hypotheses 1a and 1b cannot be rejected.

Both the comparison by country and the grouped OECD versus US comparison show no significant differences in the methods chosen to value transferred intangible

Table 3
Selected demographics of the final sample of TNCs in this study

	Sample size	Sales size (US\$M)	Income (US\$M)	ROE	ROA	ROS	Economic stability (TNC)	Economic stability (subsidiary)	Subsidiary–government relations
Canada	10	1892	–96	–14.67	–1.08	–2.01	4.10	3.80	3.50
Germany	8	9591	171	7.54	3.25	1.23	4.50	4.13	3.25
Japan	18	13,831	–12.63	2.61	2.16	1.87	3.94	3.28	3.17
UK	10	8728	383	9.77	5.47	4.83	4.70	4.30	3.30
US	113	8324	143	8.11	14.38	2.76	4.42	3.73	3.66
K–W	159	0.0028**	0.0902	0.0037**	0.0746	0.0781	0.1715	0.1726	0.0364*
<i>Composition of US (aggregate) sample of 113 TNCs by location of subsidiary</i>									
US/Canada	45	8396	75	8.22	3.93	3.28	4.35	3.91	3.69
US/Germany	24	9968	251	8.21	20.18	2.89	4.42	3.42	3.50
US/Japan	17	4279	49	6.96	28.38	1.81	4.58	3.53	3.35
US/UK	27	9183	215	8.51	18.36	2.37	4.41	3.81	3.96
K–W	113	0.5783	0.5879	0.6580	0.9233	0.4654	0.8529	0.4771	0.0497*

Sales and income means reported in million US dollars.

Economic/government relations measured on a five-point Likert scale, where 1 = *Very unstable* and 5 = *Very stable*.

* Significant at $\alpha=0.05$.

** Significant at $\alpha=0.01$.

Table 4
Types of intangible property transferred by TNCs

	Patent	Copyright	Trademark	Franchise	Method	Total
Canada	5	1	5	3	7	21
Germany	6	0	4	1	4	15
Japan	9	0	7	1	9	26
UK	15	2	8	2	7	34
US	79	14	85	17	47	242
Totals	114 (34%)	17 (5%)	109 (32%)	24 (7%)	74 (22%)	338 (100%)
K–W	0.2524	0.3621	0.0109*	0.5215	0.2348	

Composition of US (aggregate) sample of 133 TNCs by location of subsidiary

US (Canada)	33	3	30	6	18	90
US (Germany)	15	5	18	3	9	50
US (Japan)	13	1	15	3	10	42
US (UK)	18	5	22	5	10	60
Totals	79	14	85	17	47	242
K–W	0.7178	0.2130	0.2786	0.9045	0.4756	

Total types of intangibles transferred (338) exceeds total sample size (159) because some TNCs transferred more than one type of intangible asset.

* Significant at $\alpha=.05$.

property. When given their choice of a transfer pricing method unconstrained by regulations, there were no significant intercountry differences. However, there were significant intracountry differences between TNCs' current and their preferred transfer pricing methods. TNCs based in Japan and in the US would significantly change the methods currently used to transfer intangibles. For Japanese TNCs, there was no pattern: Some TNCs currently using CUP would switch to other methods, while some TNCs using non-CUP methods would switch to CUP. US TNCs would change from the CUT and other methods to the profit-split method or cost sharing. When evaluated by type of intangible, the CUP/CUT method was the most common for patents, copyrights, and trademarks, while other methods were more prevalent in valuing franchises and method transfers.

Although there are no significant differences among the countries, fully 25% of the responding TNCs currently use a transfer pricing method to value intangible property that is not one of the methods specifically defined by either the OECD or the US IRS. There are several reasons contributing to this divergence from the recommended methods, but it is difficult to determine which has had the most impact on a TNC's decisions.

First, the most recent biennial Ernst & Young (1999) transfer pricing study found "a disturbing reliance on pure historical practice as opposed to acceptable and endorsed methods" (p. 5). Prior to 1996, there was effectively no guidance on the pricing of intangibles for OECD countries except that of the US IRS. As a result, many non-US TNCs may have felt unfettered in their choices of a method. Once the OECD (1996, 1997) guidelines were issued, some TNCs may not have felt compelled to change methods since the OECD has

Table 5
Actual and preferred intangible transfer pricing methods

	Canada	Germany	Japan	UK	US	Totals
<i>Actual method currently used by TNCs</i>						
CUP or CUT	3 (30.0%)	5 (62.5%)	8 (44.4%)	1 (10.0%)	54 (47.8%)	71 (44.6%)
Profit split	0 (0.0%)	0 (0.0%)	1 (5.6%)	3 (30.0%)	5 (4.4%)	9 (5.7%)
Comparable profits or TNMM	2 (20.0%)	1 (12.5%)	4 (22.2%)	1 (10.0%)	8 (7.1%)	16 (10.1%)
Cost sharing	3 (30.0%)	0 (0.0%)	2 (11.1%)	2 (20.0%)	17 (15.0%)	24 (15.1%)
Other	2 (20.0%)	2 (25.0%)	3 (16.7%)	3 (30.0%)	29 (25.7%)	39 (24.5%)
Totals	10 (100%)	8 (100%)	18 (100%)	10 (100%)	113 (100%)	159 (100%)

K–W chi-square

approximation = 0.2152

OECD versus US: K–W = 0.6771

Method preferred by tncs if unconstrained by regulations

CUP or CUT	3 (30.0%)	4 (50.0%)	8 (44.4%)	2 (20.0%)	46 (40.7%)	63 (39.6%)
Profit split	0 (0.0%)	1 (12.5%)	1 (5.5%)	0 (0.0%)	16 (14.2%)	18 (11.3%)
Comparable profits or TNMM	0 (0.0%)	1 (12.5%)	3 (16.7%)	1 (10.0%)	7 (6.2%)	12 (7.6%)
Cost sharing	1 (10.0%)	1 (12.5%)	3 (16.7%)	1 (10.0%)	24 (21.2%)	30 (18.9%)
Other	6 (60.0%)	1 (12.5%)	3 (16.7%)	6 (60.0%)	20 (17.7%)	36 (22.6%)
Totals	10 (100%)	8 (100%)	18 (100%)	10 (100%)	113 (100%)	159 (100%)

K–W chi-square

approximation = 0.5543

OECD versus US: K–W = 0.3484

Actual versus preferred

Canada	Germany	Japan	UK	US
0.2615	0.2156	0.0025**	0.1246	0.0001**

Actual method associated with the type of intangible

	Patent	Copyright	Trademark	Franchise	Method
CUP or CUT	48 (42.1%)	8 (47.1%)	50 (45.9%)	9 (37.5%)	23 (31.5%)
Profit split	7 (6.1%)	0 (0.0%)	6 (5.5%)	1 (4.2%)	3 (4.1%)
Comparable profits or TNMM	13 (11.5%)	0 (0.0%)	10 (9.2%)	1 (4.2%)	11 (15.1%)
Cost sharing	16 (14.0%)	3 (17.6%)	14 (12.8%)	2 (8.3%)	8 (10.9%)
Other	30 (26.3%)	6 (35.3%)	29 (26.6%)	11 (45.8%)	28 (38.4%)
Totals	114 (100%)	17 (100%)	109 (100%)	24 (100%)	73 (100%)

** Significant at $\alpha = .01$.

always stressed the voluntary nature of its guidelines, which have never been described as either mandatory or as regulations.

Second, as the OECD transfer pricing guidelines are adopted in varying degrees by more countries, and as pressure increases for conformity across the borders of European Union countries, the US transfer pricing regulations are no longer automatically accorded primacy in a TNC's decision-making process. Many TNCs may choose an alternative method and internally document that choice in case of an audit, pointing both to the lack of specificity

regarding “other” methods, and to the OECD’s concern with *how* prices are set (a subjective test focusing on behavior), not the US’s concern with a result that is arm’s length (an objective test focusing on taxable income).

Third, “fiscal authorities worldwide seem to be competing to wield the biggest, best and hardest-hitting transfer pricing rules and regulations,” with the “strict US-initiated transfer pricing model (with accompanying documentation requirements, penalties, and enforcement) . . . spreading quickly to other nations” (Cooper, 2000, pp. 13–14). More jurisdictions have increased their transfer pricing audit activity, while others have instituted severe penalties for noncompliance. Although the arm’s-length principle underlies the vast majority of existing transfer pricing legislation, “the ways in which the principle is applied in practice and the requirements for documenting its adherence can vary substantially by country. As a result, MNCs are increasingly caught in a tug-of-war among competing tax jurisdictions, each trying hard to maintain its ‘fair share’ of taxes collected from MNCs” (Cooper, 2000, p. 13). This possibility, coupled with the relative decrease in importance of US regulations, may be leading TNCs to choose a method that optimizes operating performance, after a cost/benefit analysis in which the TNC is fully aware of the risk of an audit from one country but not from others. For example, Japanese TNCs are confident that they will not be audited by their home-country tax authority, the NTAA (given the history of the NTAA auditing non-Japanese TNCs almost exclusively), so these TNCs may be more willing not to comply with Japanese transfer pricing regulations.

Finally, due to the responses of TNCs to the almost geometric pace of globalization and technological innovation, the resulting “new structures and technologies that change the internal business organization often introduce conflicts with the diverse tax and regulatory frameworks applicable in different jurisdictions” (Durst, Stone, Rolfe, & Happell, 1999, p. 5). There is also a concomitant increase in the number and complexity of cross-border transactions with transfer pricing implications. Perhaps the TNCs are experiencing some of these conflicts regarding the pricing of the more innovative types of recently developed intangibles. Given the uniqueness of some intangible property, it may be difficult to use a prescribed method to value them, hence, the preference for other methods. Although the OECD guidelines and IRS regulations are somewhat synchronized, they are obviously out of step with the TNCs’ environment. Whatever the reasons motivating the TNCs, a quarter of them do not “play by the rules.”

4.2. Hypothesis 2

The hypothesis that the choice of an intangible transfer pricing method is not affected by organizational, environmental, or financial characteristics of the TNC can be rejected only for eight of the 25 characteristics, as shown in Table 6. Most of the tabular responses are the overall means of the TNC responses to the specific items comprising each factor. The means are based on a five-point Likert scale, where 1 = *Very negative/unimportant* and 5 = *Very positive/important*.

Given the significance of ROE and ROA, the marginal significance of ROS, and the relative size of ROS and income, the transfer pricing method chosen is related to a TNC’s

Table 6

Relationship of TNC organizational, financial, and environmental characteristics to TNC transfer pricing method choice

Factors and means (where applicable)	CUP, <i>n</i> = 71	Profit split, <i>n</i> = 9	Comparable profits or TNMM, <i>n</i> = 16	Cost sharing, <i>n</i> = 24	Other, <i>n</i> = 39	K–W probability, <i>N</i> = 159
<i>Organizational</i>						
Country						0.2152
Sales	US\$7258	US\$11,406	US\$6836	US\$16,056	US\$6858	0.2949
Industry						0.0316*
PE1 nonincome measures/home	3.96	4.11	4.50	4.26	4.31	0.0093**
PE2 income measures/home	3.39	3.89	3.81	3.65	3.80	0.0323*
PE3 ratios/home	3.54	3.33	3.38	3.55	3.94	0.5084
PE4 innovation/home	3.46	3.67	3.69	3.43	3.74	0.9023
PE1 nonincome measures/host	3.90	4.00	4.44	4.30	4.34	0.0010*
PE2 income measures/host	3.42	3.78	3.88	3.57	3.77	0.0936
PE3 ratios/host	3.64	3.67	3.44	3.30	4.09	0.1144
PE4 innovation/host	3.25	3.22	3.75	3.17	3.49	0.6160
TPC1 ease/cost	4.32	4.33	4.31	4.25	4.50	0.7733
TPC2 evaluation	3.29	2.89	3.88	2.83	3.32	0.3032
TPC3 decision making	3.03	3.11	2.63	2.63	3.34	0.0213*
<i>Environmental</i>						
TNC economic stability	4.38	4.44	4.38	4.00	4.54	0.1097
Subsidiary economic stability	3.52	3.56	3.75	3.96	4.03	0.2212
Host government relations	3.52	3.22	3.50	3.83	3.54	0.1958
Audit status/home country						0.5443
Audit status/host country						0.1490
TPC4 tax/trade issues	3.37	3.33	3.50	3.25	3.63	0.4016
TPC5 global concerns	3.19	2.89	3.19	2.92	3.61	0.0486*
<i>Financial</i>						
ROS	0.96	5.30	4.22	1.27	4.46	0.0647
ROE	1.35	16.49	11.15	3.61	12.55	0.0466*
ROA	13.31	7.19	5.84	18.67	5.64	0.0330*
Income	– US\$59.09	US\$408.34	US\$210.02	US\$244.01	US\$305.31	0.5847

Sales and income means reported in million US dollars.

Economic/government relations means use a five-point scale, where 1 = *Very negative* and 5 = *Very positive*.The overall factor means are the sums of the items gathered under that factor, using a five-point scale, where 1 = *Very unimportant* and 5 = *Very important*.* Significant at $\alpha = .05$.** Significant at $\alpha = .01$.

financial characteristics. Those TNCs using the profit-split method are more financially robust than TNCs using other methods. Seven of the nine TNCs using the profit-split method were involved in the production of machinery and equipment — this mirrors the findings of prior tangible pricing studies for TNC. However, many of the methods used are not in accordance with OECD guidelines or US IRS regulations.

Overall, organizational measures were not significant. As expected, TNCs using either the profit split, CPM, or TNMM considered income measures (PE2) to be more important in evaluating both host and home managers than did TNCs using transaction-based or other measures. TNCs using CPM or TNMM considered nonincome measures (PE1), such as adherence to goals, as most important in the evaluation of managers. While not significant, transfer pricing methods for intangible property were chosen by all TNCs first and foremost based on cost and ease of implementation and usage (TPC1).

Environmental factors showed little relationship to transfer pricing method choice. Of interest was that tax/trade issues (TPC4) were a distant second factor of the four factors considered as affecting method choice. This is contrary to findings regarding transfer pricing methods for tangible goods, where tax considerations are the driving force behind the choice of a transfer pricing method (Borkowski, 1996; Jacob, 1996; Klassen et al., 1993). As Halperin and Srinidhi (1996) note, all existing research regarding transfer pricing and tax issues addresses only tangible assets, and may not be transferable to suppositions regarding intangible assets. Additionally, the tax/trade factor (TPC4) is the result of a factor analysis in which ten individual items related to tax, trade, and tariff issues loaded on this particular dimension (see Question 8 in Appendix A). The specific item assessing the effect of US Section 482 on a TNC's transfer pricing policy had an overall mean of 4.02 (on a five-point scale, where 5 = *most important*), with individual country means ranging from 3.60 (UK) to 4.56 (Japan). For the item assessing the impact of non-US tax regulations, the overall mean was 3.38, ranging from 2.00 (Germany) to 3.61 (US). Perhaps the unique character of intangible assets leads TNCs to use transfer pricing in the spirit in which it was originally intended, rather than as a manipulative tool to subvert tax laws by shifting profits across borders.

4.3. Hypothesis 3

The hypothesis that tax-audit status is not affected by the location of the TNC can be rejected, given the results in Table 7. Tax-audit status vis-à-vis a country's tax authority should not be confused with a TNC's financial audit status vis-à-vis its public accounting firm. Audit experiences with host-country tax authorities are similar across countries with the exception of the UK. It is with home-country tax authorities, and a comparison by the US IRS and non-US tax authorities, that significant differences arise.

The audits with their own tax authorities were significantly higher for Canada (Revenue Canada) and the US (IRS), and significantly lower for Japanese (NTAA) TNCs. In fact, no Japanese TNC was audited by the NTAA (a finding that confirms that of Ernst & Young, 1999), compared with 40% of Canadian and British TNCs and 62% of US TNCs by their respective home tax authorities. In intra-TNC comparisons, both

Table 7

Audit status for host and home countries by country

	Canada	Germany	Japan	UK	US	Totals
<i>TNC audit status with host-country tax authority^a</i>						
No audit	9 (90.0%)	7 (87.5%)	13 (72.2%)	4 (40.0%)	73 (64.6%)	106 (66.7%)
Audit	1 (10.0%)	1 (12.5%)	5 (27.8%)	6 (60.0%)	40 (35.4%)	53 (33.3%)
Totals	10	8	18	10	113	159 (100%)

K–W chi-square approximation = 0.1061

OECD countries versus US: K–W = 0.3882

<i>TNC audit status with home country tax authority^b</i>						
No audit	6 (60.0%)	7 (87.5%)	18 (100.0%)	6 (60.0%)	43 (38.1%)	80 (50.3%)
Audit	4 (40.0%)	1 (12.5%)	0 (0.0%)	4 (40.0%)	70 (61.9%)	79 (49.7%)
Totals	10	8	18	10	113	159 (100%)

K–W chi-square approximation = 0.0001**

OECD countries versus US: K–W = 0.0001**

Host versus home country audit status by country

Canada	Germany	Japan	UK	US
0.2207	0.7055	0.9999	0.4533	0.0036**

Audit status of TNCs with the US tax authority (IRS) regardless of host/home status: K–W chi-square approximation = 0.0003**

Audit status of TNCs with other tax authorities regardless of host/home status: K–W chi-square approximation = 0.0254*

^a Canadian, German, Japanese, and UK TNCs audited by the US IRS. US TNCs audited by the Canadian, German, Japanese, and UK tax authorities.^b Canadian, German, Japanese, and UK TNCs audited by their own tax authorities. US TNCs audited by the IRS.* Significant at $\alpha = .05$.** Significant at $\alpha = .01$.

Japanese and US TNCs experienced different treatments from host and home tax authorities, in the opposite direction. US TNCs and their subsidiaries are more likely to be audited by their home (IRS) authority, while Japanese TNCs had no fear of an audit by their home (NTAA) authority.

4.4. Hypothesis 4

There are significant differences across countries in how TNCs counter the effects of transfer pricing, leading to the rejection of Hypothesis 4. The data in Table 8 indicate that TNCs domiciled in the UK and the US are more likely to keep two sets of books to isolate transfer pricing effects from management decisions, and most likely not to be passive and do nothing.

Of Japanese TNCs, 39% do nothing to account for transfer pricing effects, compared to only 7% of US TNCs. Interestingly, audit history reveals that UK and US TNCs have

Table 8
Type and frequency of practices undertaken to counter effects of transfer pricing

	Keep two sets of books, one for tax and another for management	Approximate conditions faced by independent market entity	Disregard transfer pricing effects in performance evaluation	Include transfer pricing adjustments in the budget	No practices used	Totals
Canada	2 (15.4%)	4 (30.8%)	3 (23.0%)	2 (15.4%)	2 (15.4%)	13 (5.9%)
Germany	2 (20.0%)	3 (30.0%)	1 (10.0%)	1 (10.0%)	3 (30.0%)	10 (4.5%)
Japan	2 (11.1%)	6 (33.3%)	1 (5.6%)	2 (11.1%)	7 (38.9%)	18 (8.1%)
UK	5 (41.7%)	1 (8.3%)	3 (25.0%)	1 (8.3%)	2 (16.7%)	12 (5.4%)
US	72 (41.7%)	26 (15.4%)	33 (19.5%)	27 (16.0%)	11 (6.5%)	169 (76.1%)
Totals	83 (37.4%)	40 (18.0%)	41 (18.5%)	33 (14.9%)	25 (11.2%)	222 [#] (100.0%)

K-W chi square approximations

0.0001** 0.3613 0.2397 0.6776 0.210*

	Companies using no practices (%)	Companies using only one practice (%)	Companies using two or more practices (%)	Totals (%)
Canada	20.0	60.0	20.0	100.0
Germany	37.5	50.0	12.5	100.0
Japan	38.9	61.1	0.0	100.0
UK	20.0	60.0	20.0	100.0
US	9.7	62.0	28.3	100.0

* Significant at $\alpha = .05$.

** Significant at $\alpha = .01$.

[#] Total number exceeds sample size due to some TNCs using more than one practice.

experienced more audits from both host and home tax authorities than the other TNCs. Correlation analysis shows that the likelihood of an audit by the home tax authority is highly correlated with both the use of two sets of book, and with choosing not to ignore transfer pricing effects, i.e. using one or more practices.

5. Conclusions

There is much more agreement among TNCs and their transfer pricing methods for intangible property than their transfer pricing methods for tangible goods. Regardless of country, significant differences in TNC demographics, and differences in the types of intangibles transferred, there were no significant differences in the methods used to value intangible property in cross-border transfers. The logical assumption is that this harmony may be due in part to the relative concurrence of the OECD guidelines (followed by Canada, Germany, Japan, and the UK) with the US IRS regulations regarding the valuation of intangible property. With the recent issuance of the OECD's guidelines on cost sharing, it

could be assumed that intangible transfer pricing practices may become even more aligned across countries.

However, upon further analysis, the harmony is deceptive. Fully 25% of the responding TNCs use a transfer pricing method to value intangible property that is not “acceptable” to either the OECD or the US IRS. Fully 25% of the responding TNCs currently use a transfer pricing method to value intangible property that is not one of the methods specifically defined by either the OECD or the US IRS. This noncompliance is due to any or all of the following: a reliance on historical practice, the supplanting of US regulations by OECD guidelines, stronger country-specific transfer pricing rules and penalties, and/or the innovative intangibles spawned by technological change and global expansion.

The choice of an intangible pricing method is not related to country, but to industry (and, therefore, the type of intangible property transferred), TNC philosophy of managerial performance evaluation, the need for information for decision making, and global factors such as the economy, currency fluctuations, political stability, and cross-border competition. In contrast, the choice of a transfer pricing method for tangible goods is definitely related to where the TNC is domiciled, in addition to other factors. Perhaps intangible assets are more global in nature and therefore receive a more universal treatment not constrained by national borders when compared to tangible goods.

Audit experience among these TNCs does not seem to be driven by the type of transfer pricing method utilized. Instead, both the country in which the TNC is domiciled, and internal TNC practices, seem to increase the chances of an audit by the home-country tax authority. It seems that tax authorities are honoring both the letter and the spirit of the OECD guidelines and giving TNCs the discretion to choose the method optimal for their given circumstances, and that it is other factors driving an audit. An area of future research, either as a case or empirical study, is the audit status of Japanese TNCs. Given the Ernst & Young (1997) and this study’s findings, why are they seldom audited by their own tax authority, the NTAA, yet, are very frequently audited by the host countries’ tax authorities?

Many studies on tangible transfer pricing conclude that (1) regulations need to be revised to reflect a TNC’s operating realities and (2) differences between OECD guidelines and US regulations must be eliminated. In the case of intangible assets, however, the guidelines and regulations are remarkably similar, with the majority of TNCs using one of the specific approved methods for valuation, thereby satisfying both host and home tax authorities. It is a pleasure to recommend the status quo regarding the transfer pricing of intangibles, and to hope that the concurrence of TNC practice and host/home regulations will be contagious, eventually affecting the more contentious realm of tangible transfer pricing.

Appendix A. Selected survey questions

- (1) How would you characterize the economic stability of your parent company? your foreign subsidiaries? (1 = *Very negative* to 5 = *Very positive*)

- (2) How would you characterize your parent company's relations with the (insert country of the foreign subsidiary) government? (1 = *Very negative* to 5 = *Very positive*)
- (3) A. Which of the following intangibles are transferred between your parent company and its foreign subsidiary(ies)? Please check all that apply.

- Patent, invention, formula, process, design, or pattern.
- Copyright, literary musical, or artistic composition.
- Trademark, trade name, or brand name.
- Franchise, license, or contract.
- Method program, system, procedure, campaign, survey, study, forecast, estimate, customer list, or technical data.
- Other intellectual property not listed above.

- B. What is the *most prevalent* method used to determine the international transfer price for intangible property in your company?

- Exact comparable method.
- Inexact comparable method.
- Basic arm's-length rate of return method (BALRM).
- Profit split basic arm's-length rate of return method (BALRM Plus).
- Profit split method.
- Contract manufacturer approach.
- Functional analysis.
- Commensurate standard (hybrid of profit split/functional analysis).
- Other (please describe).

- C. Which transfer pricing method would your company prefer to use for intangible assets if allowed to choose the "best method" for your company (rather than being constrained by regulations)?

- (4) Which of the following best describes your company's multinational practices? Please check all that apply.

- Using two sets of books, one for tax, finance, and local purposes, the other for management and control purposes.
- Approximating in the host-country subsidiary, as closely as possible, those conditions what would be faced by an independent market entity.
- Disregarding transfer pricing aberration effects when evaluating the performance of host-country subsidiary performance.
- Taking account of any transfer pricing adjustments in the budget, so subsidiary managers are not evaluated on parent company usage of transfer prices to achieve certain goals, such as tax minimization.
- None of the above.

(5) Has your company had an adjustment proposed by an IRS international examiner since 1990? If yes, please indicate the range of the proposed adjustment.

- No. (Please go to next question.)
 Less than US\$100,000.
 Between US\$100,000 and US\$499,999.
 Between US\$500,000 and US\$1,000,000.
 Greater than US\$1,000,000.

(6) Has your company had an adjustment proposed by another country's international examiner since 1990? If yes, please indicate the range of the proposed adjustment in US dollars.

- No. (Please go to next question.)
 Less than US\$100,000.
 Between US\$100,000 and US\$499,999.
 Between US\$500,000 and US\$1,000,000.
 Greater than US\$1,000,000.

(7) In your company, how important are the following items in evaluating the performance of subsidiary managers in your home country? In the host country? (1 = *Very unimportant* to 5 = *Very important*)

Home country					Host country				
Very unimportant	Neutral			Very important	Very unimportant	Neutral			Very important
1	2	3	4	5	1	2	3	4	5

Company standards
 Net income
 Residual income
 Return on investment
 Return on sales
 Return on assets
 Market share
 Cost reduction
 Profit margin
 Sales growth
 Budget adherence
 Goal attainment
 Product innovation
 Technical innovation

(8) In your opinion, how important are the following in affecting the choice of the most prevalent transfer pricing method? (1 = *Very unimportant* to 5 = *Very important*)

	Very unimportant		Neutral		Very important
	1	2	3	4	5
Ease of understanding					
Cost of administration					
Evaluation of subsidiary profit					
Evaluation of subsidiary management					
Goal congruence					
Profit maximizing decisions/parent					
Profit maximizing decisions/subsidiary					
Managerial motivation					
Managerial autonomy					
Efficiency in subsidiary					
Optimal production decisions					
Optimal purchasing decisions					
Optimal product pricing decisions					
Fairness in management evaluation					
Better upper management control					
Minimization of managerial disputes					
US tax regulations (Section 482)					
US tax penalties (Section 6662)					
Other US tax regulations					
Tax regulations*					
Tariff regulations*					
Competition in**					
NAFTA issues					
GATT Uruguay issues					
Economic conditions in **					
Exchange rates between * and **					
Relations with ** government					
Minimization of tax payments					
Minimization of tariff/duty payments					
Management of cash flows					

* Name of TNC home country.

** Name of TNC subsidiary country.

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Pergamon

The International Journal of Accounting
36 (2001) 375–377

**The
International
Journal of
Accounting**

Capsule commentaries

Transnational Accounting (TRANSACC) by Dieter Ordelheide and KPMG, Palgrave, Houndmills, Basingstoke, Hampshire, UK, 2001, second edition, xxv + 3325 pp. (US\$650).

This massive, three-volume reference work provides detailed and authoritative chapters on the accounting norms for both individual and group accounts in 19 countries. Chapters are also devoted to the European Union's (EU) rules and to International Accounting Standards. Apart from Argentina, Australia, Canada, Japan and the United States, all of the countries are European. Of the 15 EU countries, all but Greece, Ireland and Luxembourg are included. The other European countries are Norway and Switzerland. Five countries are new to the second edition: Argentina, Finland, Italy, Norway and Portugal.

The chapters contain a wealth of historical and institutional material, as well as an extensive treatment of the governing measurement, format and disclosure norms. Two "reference matrices," dealing with (1) the recognition and valuation rules and (2) the principles of consolidation, provide a comparative analysis bridging the 19 countries and the IASC's standards, with each item keyed to the pertinent section in a chapter. A two-part glossary contains definitions of some 500 important terms in English and then displays their equivalents in 11 other languages.

This book easily justifies the price of US\$650.

The authors of the chapters are distinguished academics and practitioners, and both they and the editors have done their jobs well. This treatise is a fitting memorial to Dieter Ordelheide, one of the foremost academic leaders of European accounting, who died at age 60 in May 2000, following a long illness.

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PII: S0020-7063(01)00109-1

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IAS/UK GAAP Comparison: A Comparison Between IAS and UK Accounting Principles, by the Financial Reporting Group of Ernst Young, International Accounting Standards Committee/Ernst & Young, London, 2001, xxix + 793 pp.

This useful reference volume has been prepared along the lines of the two GAAP comparison books that were reported in the Capsule Commentary section in Vol. 36, No. 2 of this journal. The core of the book consists of a detailed comparison of UK GAAP and IASC standards on facing pages, and in an opening chapter, the regulatory background to UK and IASC financial reporting is discussed. Almost one-fifth of the book is devoted to a concluding chapter in which the principal differences between UK GAAP and IASC standards are summarized.

The authoritative treatise appears at an opportune time, as the old IASC board has now been replaced by the IASB.

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PII: S0020-7063(01)00110-8

International accounting standards: survey 2000

by David Cairns, International Financial Reporting (www.cairns.co.uk), Henley-on-Thames, Oxfordshire, UK, 2001, xii+371 pp. (£250/US\$370/•420)

This is the second edition of David Cairns' immensely valuable survey of the use of IASC standards around the world. This edition is one third longer than its predecessor, yet it is much more reasonably priced (£250 versus £650).

In this second edition, Cairns found that 102 (62%) of 165 companies that referred to the use of IAS in their financial statements actually complied fully with the IAS. That compares with 54% of the 125 companies he surveyed the previous year. He observes that "IAS lite' is alive and well" (p. 2). He also found that the auditors of more than one third of the surveyed companies did not report on compliance with IAS.

As he notes, by 2005, the European Union will require all listed companies to publish IAS financial statements. Yet, he adds, only 20% of the FTSE's Eurotop 300 companies currently uses IAS. Otherwise put, almost 250 of Europe's largest companies will have to change their financial reporting in time for the deadline. "This is an immense challenge," he writes, "for the companies, their auditors, and, indeed, the users of their financial statements" (p. 3).

Cairns' survey is rich in detail and covers 26 countries (plus Hong Kong). Of the 165 companies included in the study, all but 22 are European. Introductory chapters deal with the nature and role of the IASC, IOSCO, the SEC, and the EU, and also explain the sources of national GAAP and its relation with IAS in each of the 27 jurisdictions as well as in others not covered by the survey. Instances of noncompliance with IAS are analyzed both by company and by the relevant IASC standard.

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Pergamon

The International Journal of Accounting
36 (2001) 381–383

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Book review

Corporate governance, accountability, and pressures to perform: an international study
by Istemi S. Demirag, JAI Press, Stamford, CT, 1998, xv+395 pp.

Over the last decade, Istemi Demirag has been steadily and energetically contributing to the debate on corporate governance, exploring how corporate governance systems introduce bias into the investment decisions of the firm — the so-called *short termism* problem. Short termism is a form of investment myopia — or, more rigorously, the tendency of firms to make decisions on the basis of a discount rate that exceeds the firm's cost of capital. It implies underinvestment in long-term, risky projects, and therefore it may undermine the long-run competitiveness of a firm — or even of a whole economic system.

While the ghost of investment myopia has been haunting many debates on corporate governance, “industrial renewal” and the competitive future of nations, an adequate empirical picture of such a phenomenon is still missing. On these premises, the book edited by Demirag is a welcome contribution, as it improves our understanding of short termism and frames the issue in a proper international, comparative perspective.

This book stems from a research project coordinated by the editor and conducted simultaneously in 11 countries: the UK, the US, Canada, Australia, the Netherlands, Sweden, Denmark, France, Italy, Germany and Japan. (Austria and Switzerland are also considered in the subproject on Germany.) The geographical breadth of this project makes it, in itself, a remarkable exception in a research landscape dominated by studies on the Anglo-Saxon institutional context.

Indeed, the research project is not aimed at comparing the *actual* nature and intensity of short termism in such countries, but rather at investigating how pressures toward short-term performance are *perceived* by key actors in the decision making process, and how such pressures consequently affect the selection and evaluation of R&D projects — taken here as paradigmatic examples of risky, long-term investments vital to the firms' future. The same questionnaire has provided the ground for a survey that has been conducted in all 11 countries, targeting the financial directors of listed (and exceptionally nonlisted) companies.

The book is organized by national systems. For every country, a chapter provides a thorough introduction to the structure and recent evolution of its national corporate governance system, and reports the results of the survey research. An introductory chapter sets a general framework for the research project; a final chapter indicates “emerging trends and clusters,” and discusses some comparative data.

The theoretical framework presented by Demirag is complex, but it still relies on the accepted distinction between a market-oriented “outsider” model of corporate governance

(such as that one prevailing in the US and UK), and an “insider” model, where the role of the banking system is much more emphasized. Examples of the latter are the European “continental” model and the Japanese model. The outsider model is one in which unsatisfied investors tend to resort more frequently to exit than to voice, and in which managerial reward systems reflect more directly the short-run performance of the firm. As a result, one should expect short termism to prevail within such a corporate governance model. Furthermore, such pressures, once perceived, should be reflected in the selection and appraisal of R&D projects, with a stronger emphasis on short-term financial indicators of performance.

Chapters dedicated to single countries have the peculiar merit of showing that national systems are evolving in directions that make the outsider–insider distinction increasingly blurred, and produce an emerging picture in which nuances count more now than in the past, and much heterogeneity can be found within each country.

The complexity of the emerging picture is reinforced by the surprising comparative results of the questionnaire survey. Japanese firms confirm their relative immunity from short-term pressures. But the data gathered by Demirag and his coworkers strikingly disconfirm the received wisdom that “continental” firms are shielded from short termism by an insider-oriented governance system. In particular, finance directors in both Germany and Italy (two archetypical examples of the continental governance system) actually exhibit a stronger perception of “pressures to perform” from shareholders and financial analysts than their UK counterparts. On this ground, as well as in the light of other findings of the research, even the very mild defense of the outsider–insider thesis attempted in the book’s conclusions is not entirely convincing. For example, the conclusion that “A majority of [the UK] group finance Directors perceive strong bias against long term research... amongst analysts and shareholders” (p. 86) requires one to stretch somewhat the interpretation of the questionnaire responses, which show little concern for the effects of such bias, if any exists. (By the way, Demirag and his coauthors are very careful to point to the most problematic evidence.) Indeed, the most surprising and challenging result is that the conventional classification of national governance systems is of little help in predicting the perception of pressures to perform by corporate decision makers — a finding that, if confirmed by further research, will force a substantial revision of many entrenched beliefs.

Given these unexpected results, which go against the stream of current thinking, the reader may regret that little effort has been made to characterize groups of firms within each national system. For example, one might argue that short termism affects the sample firms differently as a result of major differences in their governance structure. Or, at least, it would be desirable to know whether there is any systematic relation between different “short termistic” features emerging from the questionnaires. Unfortunately, only a few of the chapters attempt to analyze the main features of “high pressure” firms and test hypotheses about their “short termist” behavior. (This may be due to sample size problems in many of the national surveys.) In most cases, only average responses and a few other descriptive statistics are reported.

Responses on the evaluation and management of R&D projects within the sample firms provide additional, precious information on a subject on which systematic empirical research is in short supply. It confirms that financial measures are still much in use in evaluating and assessing innovation projects, although it is hard to establish their actual impact on the actual

decision-making process (and finance directors might be quite biased respondents in this respect). Since data gathered in the different countries come from the same questionnaire format, it is really a pity that the results are not presented in homogeneous ways across different chapters, thus making comparative assessments rather uneasy.

Despite a few missed opportunities in fully exploiting the comparative potential of data collected, the book clearly stands as a major effort to place the debate on short termism in the right international perspective. While evidence of short termism in the financial directors' perceptions is found, apparently it does not meaningfully relate to conventional governance models. There must clearly be more than the insider/outsider distinction to the explanation of investment myopia. After all, a banking system hungry for liquidity may be more myopic than markets. And, as the recent dot-com craze suggests, markets in search of self-reinforcing expectations may occasionally run into the opposite visual defect.

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Pergamon

The International Journal of Accounting
36 (2001) 385–386

The
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Book review

The convergence handbook: a comparison between international accounting standards and UK financial reporting requirements

by David Cairns and Christopher Nobes, The Institute of Chartered Accountants of England and Wales, London, December 2000, pp. v+108 (£25).

The purpose of this handbook is to compare the accounting requirements for UK companies (UK GAAP) with the requirements of International Accounting Standards (IASs) and make recommendations for improvements to both. A foreword by Sir David Tweedie, then chairman of the UK Accounting Standards Board (ASB), explains that the work was carried out at the request of the ASB. It was prompted by the European Commission's proposal to improve the harmonization of accounting within the single market, which will lead to the consolidated accounts of listed companies within the European Union being required to comply with IASs by 2005. This proposal is significant for financial reporting in the British Isles, and accordingly the ASB has given *The Convergence Handbook* the status of an exposure draft in its own consultation process.

The authors, who need no introduction in the literature of international accounting, were chosen for their close involvement with the work of the IASC: David Cairns as Secretary General for 10 years to 1994 and Chris Nobes as one of the two UK board delegates to IASC since 1993.

The major part of the text is an "inventory of differences," arranged by five sections covering the context of reporting, assets and revenue, liabilities, group accounting, and presentation and disclosures. Within each section there are topics, 28 in all. For each topic there is a concisely structured and readable analysis of (a) incompatibilities, (b) items dealt with in more detail by UK requirements, (c) items dealt with in more detail by IAS requirements, (d) extra disclosures required by UK requirements, and (e) extra disclosures required by IAS requirements.

This exercise has value in itself in bringing up to date a UK/IAS comparison. The authors go further in Chapter 4 in showing where recommendations for change must lie if convergence is to be achieved, and linking these to the inventory of differences. The first route is to improve existing UK GAAP by eliminating optional accounting treatments and by adopting superior IAS treatments. The second route is to change company law, with the key problem lying in the concept of "realized profits." Next come recommendations for improvement in existing IASs by eliminating optional accounting treatments and by adopting superior UK GAAP treatments, with the third route being the IASC Improvements Project (suggestions include prohibition of LIFO), and the fourth route being major IASC projects

(suggestions include replacing the cash flow standard IAS 7 with the UK standard FRS 1). The fifth route is joint projects continuing work of the kind formerly undertaken by the G4 + 1 standard setters.

The remit of the *Handbook* necessitates what could be read as recommendations on bilateral negotiation; the authors are aware that the UK's ASB is only one of the players involved in convergence moves. The phrase "superior treatments," in places expanded to "superior UK treatments," might be seen in a global context as a whiff of imperialism, although again it is largely a consequence of the stated remit. No prioritization is offered in relation to the five sets of recommendations, either across the categories or within each. The foreword by the secretary general of the IASC asserts that the future success of the IASC in achieving convergence will depend heavily on the maintenance of several strong national standard setters to ensure that international decisions are tested in the context of excellent national contributions. That assertion is written in a context of praising the ASB for its distinguished record in setting domestic accounting standards and contributing strongly in the international debate. However, it does admit continuation of what may become uneasy moves to finding the balance of power in global standard setting. The authors warn that the IOSCO endorsement of IASs must not be allowed to block continuing development of IASs.

The ASB should be congratulated for commissioning this work by two outstanding writers and on using it as an early opportunity for consultation on the UK position. Given the European Commission's target of 2005, it is important to understand the implications of accepting IASs if that were to involve losing what could be regarded as "superior" UK elements. *The Convergence Handbook* is a useful reference source that goes beyond technical comparisons and toward proposing steps to convergence. It leaves the reader with scope for thought-provoking analysis of the priorities and sequence of events. It gives no advice on the negotiating stance that might be taken by the national standard setter. Should the domestic situation be put in order, hoping that the IASC will reciprocate? Should the national body make changes, but conditional on seeing the IASC match these concessions? Is any one of the recommendations in *The Convergence Handbook* a step too far for either party? The analytical basis of this book should be of interest well beyond its UK-specific context.

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Pergamon

The International Journal of Accounting
36 (2001) 387–389

**The
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Book review

Comparative issues in local government accounting

By Eugenio Caperchione and Riccardo Mussari, Kluwer Academic Publishing, Boston/Dordrecht/London, 2000, xx+266 pp.

During the last two decades, there have been a number of significant reforms in local government accounting practices around the world. A common factor driving all of these changes is the increasing need for governments to measure the efficacy and efficiency of their performance. This trend is particularly apparent at the local government level. The purpose of this book, according to its preface, is to provide a comparative international perspective on local government innovations, and it presents specific cases involving different economic, political, and cultural conditions. Countries receiving extended treatment include Belgium, China, France, Italy, Japan, Malaysia, the Netherlands, New Zealand, Russia, Spain, UK, and the US. The book contains 15 comparative papers written by 21 authors (including the editors) that were presented at the Sixth Biennial Comparative International Government Accounting Research Conference, which was held at Bocconi University in Milan on June 5–6, 1997. The authors updated their papers in order to investigate thoroughly the accounting issues they had chosen to address during the conference.

The result is a remarkable overview of issues of topical interest concerning local government accounting in many countries. The accounting reforms are part of far-reaching and very complex processes of social change, which define new grounds for the relationship between government and citizens. It is very difficult to identify and suggest one single key to the interpretation of these changes. Differences can be found according to the following variables: stage of economic development, the form of government, geographic size, history, accounting traditions, legal structure, state and governmental models, the roles ascribed to central and local government levels, and how accounting standards are set out and reviewed. Nevertheless, at the level of local government, one notices a growing awareness of the need for suitable accounting systems to generate information on the results produced in terms of effectiveness, efficiency, and economy.

The paper on “Accounting and Accountability in Local Government: A Framework,” by Elio Borgonovi and Eugenio Anessi-Pessina (Italy), gives a short overview on current trends in the role and structure of local government and their implications for local government accounting. The integration of cash accounting with accrual accounting and the recognition, control, and disclosure of economic performances are certainly the key factors in this evolution. The authors state that “LG accounting should become a component of a wider

information system covering cash flows, costs and revenues, assets and liabilities, but also activities, outputs, needs, customer satisfaction” and “what we need is no longer (or not solely) ‘government accounting’ but rather ‘accounting for governance’” (p. 9).

The following five contributions focus on a comparative analysis of similarities and differences that characterize the accounting approaches adopted in various national contexts. Based on general assumptions about economic and political significance, as well taking into account the analytical significance of budget coverage, James L. Chan (US) describes the transformation of the Chinese state budget during the reform period and illustrates how the American federal government applies the unified budget principle. He identifies some exceptions to the rule and draws some Sino-American comparisons.

Despite considerable similarities in societal, political, and administrative variables, the UK and New Zealand have chosen different ways of reforming capital accounting in local governments. Irvine Lapsley (Scotland) and June Pallot (New Zealand) report that in both countries, there is an increasing belief that private sector accounting practices are equally applicable to the public sector (as proposed by the Public Sector Committee of the International Federation of Accountants). Nevertheless, several “accounting mutations” occurred when aligning public sector accounting with that of the private sector. Furthermore, it is not possible to understand fully accounting outcomes through an examination of the merits of cash versus accrual accounting alone. Also, the determination of proper accounting practice inevitably reflects some significant contextual factors, including the history of past practices. The study reveals a high incidence of noncompliance within local authorities in both countries.

A study about financial reporting practice in the UK and Malaysia (Hugh M. Coombs and Mohamad Tayib) shows that the development of public sector accounting in the two countries has been very much influenced by the level of interest expressed by central government and professional bodies. The disclosure practices of local authorities are shaped by the complex and dynamic environment in which their reporting practices originated.

In his paper, Eugenio Caperchione (Italy) brings out the reasons behind innovations in governmental accounting systems. His paper, which is written from a very interesting methodological point of view, aims at analyzing the state of the art of governmental accounting systems in a number of market economy countries. The guidelines of the reforms implemented, or under discussion, in the leading countries are presented and commented upon, some degree of uniformity is pointed out, and the main trends are identified. One of the most interesting results of his study is the fact that “there are no indisputable elements nor objective findings to sustain that accrual accounting actually improves information that is useful in making economic decisions and, consequently, the performance of public entities” (p. 82). He writes, “No accounting system enjoys universal validity, as accountancy always holds an instrumental function . . . [and] the more contextual the modernisation of accountancy is to the overall modernisation of the entire public administration of a country, the more meaning and vigour it acquires. Whenever it is reduced to mere technicality, it hardly ever produces the expected results” (p. 83).

The fifth of the comparative papers, presented by José Manuel Vela and Iluminada Fuertes (Spain), deals with some methodological considerations about the comparative analysis of local governmental accounting systems in Europe. The present state of accounting systems

reflects a high degree of heterogeneity. Differences among municipal organizations, in accounting standard-setting organizations, and even in accounting systems are the main factors why any comparability or harmonization of local governmental accounting systems is difficult to achieve. Nevertheless, the European Union should start with the implementation of a process of convergence in government accounting systems. They write, “This process has been developed at a business accounting level ever since the seventies and has offered at this level, to date, clear encouraging results. We don’t find objective reasons to argue that a harmonization process of National Governments in Europe is not justifiable or convenient in the European Union” (p. 99).

All of the other papers concentrate on highly important issues in the current stage of accounting innovation, and their analysis is focused on individual countries. Johan R. Christiaens highlights (with reference to the municipal accounting reform in Flanders) how the introduction of accrual accounting often does not lead to a higher quality of information available to managers, especially when budgetary accounting systems continue to prevail over business-like accounting. G. Jan van Helden’s paper offers some interesting views on the organizational difficulties when cost allocation systems are introduced in a Dutch municipality. Kiyoshi Yamamoto expands Klaus Lüder’s contingency model into a multiprincipal and agent model in terms of governance, which was useful for explaining plural reforms in the Japanese public sector. Anatoli Bourmistrov and Frode Mellempvik give an impressive analysis of the development of accounting systems in Russia, and they come to the conclusion that the accounting reality does not change as fast as the rhetoric of politicians, reflecting the ideas of *perestroika* (p. 170).

When local authorities decided to adopt accrual accounting, one of the thorniest problems to tackle lays in the measurement and recognition of long-term assets and, more specifically, the infrastructure assets and national heritage. The different solutions to this issue are shown in the papers of Riccardo Mussari (Italy), Rita H. Cheng and Jean E. Harris (US), Amparo Gimeno Ruiz (Spain), and Evelyne Lande (France). One paper is dedicated to the external audit in Spain (Vicente Montesinos Julve).

The editors, in short, have produced a well-organized collection of revised papers, which give a good and valuable insight into various aspects of activities to increase the performance of local government accounting systems throughout the world. This makes the book suitable both for scholars and practitioners. It can also serve as resource material for courses in public sector accounting.

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THE INTERNATIONAL JOURNAL
OF ACCOUNTING
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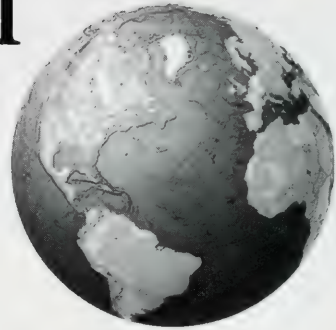
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The International Journal of Accounting

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VOLUME 36, NUMBER 4, 2001

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Name of publication: **THE INTERNATIONAL JOURNAL OF ACCOUNTING** (ISSN:0020-7063)
Office of publication: Elsevier Science Inc.
655 Avenue of the Americas
New York, NY 10010-5107

Published quarterly. Annual institutional subscription rates for 2002: USD 306 for all countries except Europe and Japan. JPY 36,300 for Japan. EUR 273 for European countries. Associated personal price for 2002: USD 118 for all countries except Europe and Japan. JPY 14,000 for Japan. EUR 106 for European countries.

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Editorial Office: Center for International Education & Research in Accounting
320 Wohlers Hall
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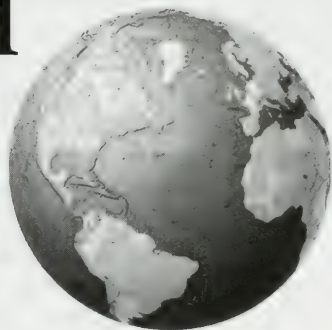
0020-7063(200112)36:4*;1-F

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The International Journal of Accounting



VOLUME 36, NUMBER 4, 2001

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THE INTERNATIONAL JOURNAL OF ACCOUNTING

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The International Journal of Accounting
36 (2001) 391–406

**The
International
Journal of
Accounting**

The nature of information in accruals and cash flows in an emerging capital market: The case of China

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Abstract

Our study investigates the relative and incremental information content of earnings, operating cash flows, and accruals in the emerging capital market of China. The issue is tested by regressing stock returns on the levels of earnings and their components. Based on a sample of 1516 firm-years for listed Chinese firms during 1995–1998, our results demonstrate that earnings have relative information content over operating cash flows. The autocorrelations and cross-sectional correlations also imply that earnings have greater persistence and predictability than operating cash flows. We also find that discretionary accruals provide incremental information beyond that contained in nondiscretionary accruals, consistent with the argument that discretionary accruals improve the relevance of earnings in reflecting the fundamental values of the listed Chinese firms. Unlike prior findings in the studies on developed markets, we find no strong evidence that the value attached to discretionary accruals is lower than the value attached to nondiscretionary accruals. This is consistent with the argument that managerial policy choices available for the listed Chinese firms were rather limited during our sample period under relatively uniform People's Republic of China Accounting Standards (PRC-GAAP), thus, producing fewer opportunities for earnings management. An alternative interpretation could be that Chinese investors are functionally fixated on earnings. © 2001 University of Illinois. All rights reserved.

Keywords: Emerging markets; Cash flows; Accruals

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1. Introduction

The role of accounting earnings in pricing securities has been an important question in accounting research (e.g., Ball & Brown, 1968). Prior evidence indicates that accrual earnings play an important role in the valuation process because it mitigates timing and mismatching problems inherent in cash flow measures of firm performance (Dechow, 1994). Meanwhile, the reliability and usefulness of accruals have been questioned because managers can manipulate them to alter reported earnings through the flexibility accorded under generally accepted accounting principles (GAAP). Managerial discretion could distort reported earnings if managers manage income opportunistically, thereby garbling the reported earnings (Watts & Zimmerman, 1986). On the other hand, managerial discretion could enhance earnings informativeness by allowing communication of private information (Healy & Palepu, 1993).¹

Prior studies that focus on mature markets like the United States or United Kingdom examine whether accruals add information to operating cash flows to improve earnings' ability to explain returns and whether discretionary and nondiscretionary accruals are priced differently. Some researchers document that both operating cash flows and accruals have incremental information content over each other and they are priced differently by the market (e.g., Bowen, Burghstahler, & Daley, 1987; Cheng, Liu, & Schaefer, 1997; Dechow, 1994; Wilson, 1986, 1987). On the contrary, other studies find little evidence of either component having incremental information content (e.g., Bernard & Stober, 1989). Recently, Subramanyam (1996) finds that the market prices discretionary accruals, possibly because the discretionary component improves earnings' ability to reflect fundamental value. Beaver and Engel (1996) and Walhen (1994) report that discretionary accruals have incremental information content in commercial banks' loan loss disclosures.

These studies focus on mature markets, such as in the United States. The role of accrual accounting has yet to be studied in the emerging capital market of China. Privately owned Chinese firms are at a young stage and are less known to investors. The accounting standards and practices in China are evolving slowly. Financial reporting and capital market systems, too, are relatively primitive and the quality of auditing is generally perceived to be low, compared to the mature markets of the United States and United Kingdom (Abdel-khalik, Wong, & Wu, 1999; Aharony, Lee, & Wong, 2000) where accounting systems are more sophisticated and investors relatively well informed. Some critics argue that accounting information in emerging capital markets like China may not be reliable or useful to investors. Managerial choices of accounting methods and estimates are limited because of China's relatively uniform accounting methods and procedures (discussed more in the following section). Thus, examination of pricing discretionary and nondiscretionary accruals is unlikely to shed light on our understanding of the role of accruals in China's emerging capital market.

¹ Recent studies have also investigated managers' choice of accruals on compensation (DeFond & Park, 1997), political cost (Han & Wang, 1998), and auditor change decisions (DeFond & Subramanyam, 1998). Some studies examine whether transactions and discretionary accruals are executed to achieve regulatory capital, earnings, and tax goals in the banking industry (e.g., Scholes, Wilson, & Wolfson, 1990).

This study examines the relative and incremental information content of earnings, operating cash flows, and accruals in the emerging capital market of China. The issue is investigated by regressing stock returns on the levels of earnings and its components. The coefficients and explanatory power of the regression models are compared to assess the incremental and relative information content of earnings and its components. We estimate discretionary accruals using the cross-sectional variant of the Jones model used in previous studies (e.g., Han & Wang, 1998; Jones, 1991; Subramanyam, 1996).

Our analysis is based on a sample of 1516 firm-years for listed Chinese firms during 1995–1998. Our results show that the earnings coefficient is positive and statistically significant, consistent with recent findings that earnings under the People's Republic of China Accounting Standards (PRC-GAAP) are value-relevant to investors (Bao & Chow, 1999; Haw, Qi, & Wu, 1999, 2000). While earnings alone explains 5.8% of the variation of annual returns, operating cash flows alone explains only 0.3%. The incremental adjusted R^2 of earnings over operating cash flows is statistically significant, indicating that earnings has greater relative information content. The autocorrelations and cross-sectional correlations also imply that earnings have greater persistence and predictability than operating cash flows.

Regression results indicate that earnings has incremental information content over operating cash flows, but not vice versa. Our results also demonstrate that both discretionary and nondiscretionary accruals contribute to the value-relevance of earnings. Discretionary accruals provide incremental information content beyond that contained in the nondiscretionary component of earnings, consistent with the argument that discretionary accruals improve the relevance of earnings in reflecting the fundamental value of the firm. Unlike prior findings in the developed markets, however, we find no strong evidence that the value attached to discretionary accruals is smaller than the value attached to the nondiscretionary earnings component, even though there is some weak evidence indicating that discretionary accruals have a lower multiplier than nondiscretionary accruals in the later years of our sample period. The evidence is consistent with the argument that managerial policy choices for the listed Chinese firms were rather limited in selecting accounting methods and making accounting estimates under PRC-GAAP, thus, producing fewer opportunities for earnings management. An alternative interpretation could be that Chinese investors are functionally fixated on earnings (e.g., Hand, 1989; Sloan, 1996).

The rest of this paper proceeds as follows. Section 2 discusses the institutional background. Section 3 presents the hypotheses and research design. Section 4 describes the sample. Section 5 reports empirical findings, followed by concluding remarks in Section 6.

2. Institutional background

2.1. The emerging capital market of China

The growth rate of the PRC's economy has been among the highest in the world during the last decade. One of the most important structural changes in the Chinese economy is the reactivation of security markets to improve the operating performance of state-owned

enterprises (SOEs) and promote a market-oriented economy. The history of the present Chinese stock market system can be traced back to 1984 when the Shanghai Municipal Government approved the first securities regulation in China. Subsequently, Feilo Electronics issued China's first stock in 1984, which began trading in 1986 on the over-the-counter market. However, the stockholding system did not become a significant vehicle for the SOE reform until the reactivation of the Shanghai Stock Exchange (SHSE) in December 1990 and the establishment of the Shenzhen Stock Exchange (SZSE) in April 1991. Total market capitalization of A-shares (only available to domestic investors) in the two stock exchanges accounts for more than 90% of the total market capitalization.² Several large high-profile Chinese companies are also listed on the Hong Kong and New York stock exchanges.

In July 1992, the Chinese Security Regulatory Commission (CSRC) was set up as the Chinese equivalent of the US Securities and Exchange Commission to monitor and regulate the stock market. Since then, the stock market has expanded rapidly. In 1991, there were only eight and five stocks listed on the SHSE and SZSE, respectively. By the end of 1998, the number of firms listed on these two exchanges had increased to 438 and 413. At the end of 1998, the total market capitalization of listed Chinese firms reached 1.93 trillion yuan (equivalent to US\$232 billion), up from 10.9 billion yuan (equivalent to US\$1.3 billion) in 1991. This was equivalent to 24% of China's GDP in the year, demonstrating that the stock market had become to play an important role in China's economy.

2.2. The accounting system in China

Since 1993, China has required all domestic enterprises including SOEs to use accounting standards as defined in the "Accounting System for Selected Shareholding Companies" and "Enterprise Accounting Standards" issued by the Ministry of Finance.³ The A-share companies prepare their balance sheet, income statement, and statement of changes in financial position according to PRC-GAAP, while B-share (only available to foreign investors) companies are required to prepare financial statements based on International Accounting Standards (IAS).⁴ By law, these financial statements have to be audited and released within 4 months after the fiscal year-end. All Chinese firms are required to use the same fiscal year-end as of December 31.

² Two types of shares are traded on the two stock exchanges: A-shares denominated in Renminbi to Chinese nationals in the SHSE and the SZSE and B-shares denominated in US dollars in the SHSE and Hong Kong dollars in the SZSE for foreign investors. A-shares dominate share trading on both the Shanghai and Shenzhen exchanges. At the end of 1998, 745 of the 851 listed firms only issued A-shares, 27 firms only issued B-shares, and 79 firms issued both A- and B-shares.

³ The "Accounting System for Selected Shareholding Companies" was in effect until the end of 1997. In January 1998, the Ministry of Finance revised it substantially and formalized it as "Accounting System for Shareholding Companies." The Ministry has recently issued 39 exposure drafts of detailed accounting standards, several of which have been formally promulgated. Currently, all listed Chinese companies prepare their financial statements according to this new accounting system along with the promulgated detailed accounting standards.

⁴ Cash flow statement has replaced statement of changes in financial position since mid-1998. Thus, the listed Chinese firms are required to disclose cash flow statement from the fiscal year 1998. The content of the statement is similar to FASB No. 95 in the United States.

For our sample period, significant gaps still existed between the accounting treatments under PRC-GAAP and IAS, as PRC-GAAP tended to specify the accounting methods and procedures instead of allowing managerial choices. For instance, inventories were stated at cost under PRC-GAAP, whereas IAS allows the lower-of-cost or net realizable value. Provisions for bad debts were required not to exceed 0.3–0.5% of total receivables per year under PRC-GAAP, but they are discretionary by managers under IAS. Under PRC-GAAP, only the straight-line method was allowed for the fixed asset depreciation with residual value of 3–5% of the cost of a fixed asset. In sum, managers of the listed Chinese firms had less degree of discretion in selecting accounting methods and making accounting estimates.⁵

3. Research design

3.1. Hypotheses

Previous studies (e.g., Bernard & Stober, 1989; Subramanyam, 1996; Wilson, 1986, 1987) examine the value relevance of cash flows and accruals in a regression where the dependent variable is stock returns. Based on the US data, Subramanyam (1996) and Wilson (1986, 1987), among others, report results consistent with both components having incremental information content, while Bernard and Stober (1989) find little of such evidence. Dechow (1994) reports that accrual-based earnings is a superior measure of firm performance than cash flows. Given relatively primitive and incomplete financial reporting systems and low quality of auditing in China, however, the value relevance of information contained in accruals and operating cash flows remains to be an empirical issue. This study investigates the relative information content of earnings and operating cash flows and also examines whether accrual earnings provides incremental information beyond that contained in operating cash flows in China's emerging capital market.

There is evidence that discretionary accruals have incremental information content in the mature market of the United States (Subramanyam, 1996). However, the superiority of accrual-based earnings critically depends on the availability of discretionary accounting choices and quality auditing. Since accounting policy choices and estimates are generally specified and less discretionary, compared to those in mature markets, the managers of listed Chinese firms have fewer opportunities for earnings management. Thus, we also investigate whether discretionary accruals provide incremental information content beyond that provided by the nondiscretionary component of earnings in China's emerging capital market.

3.2. Research models

In order to test the hypotheses, annual market-adjusted returns are regressed on the levels of earnings and its components, which is consistent with Dechow (1994) and

⁵ Since 1999, the new PRC accounting system and promulgated detailed accounting standards permit some flexibility in selecting accounting methods and making estimates.

Subramanyam (1996). We first develop the following linear regression models (Eqs. (1–3)) to test relative and incremental information content of net income (NI) and operating cash flows (OCF):

$$RET_{it} = \alpha + \beta_1 NI_{it} + \varepsilon_{it}, \quad (1)$$

$$RET_{it} = \alpha + \beta_1 OCF_{it} + \varepsilon_{it}, \quad (2)$$

$$RET_{it} = \alpha + \beta_1 NI_{it} + \beta_2 OCF_{it} + \varepsilon_{it}. \quad (3)$$

We then further decompose earnings to test incremental information content of total accruals (ACCR), discretionary (DAC), and nondiscretionary accruals (NDAC), separately as below (Eqs. (4) and (5)):

$$RET_{it} = \alpha + \beta_1 OCF_{it} + \beta_2 ACCR_{it} + \varepsilon_{it}, \quad (4)$$

$$RET_{it} = \alpha + \beta_1 OCF_{it} + \beta_2 NDAC_{it} + \beta_3 DAC_{it} + \varepsilon_{it}. \quad (5)$$

All of the explanatory variables are scaled by lagged total assets for firm i , consistent with prior studies. The dependent variable, RET, is annual market-adjusted stock returns measured over a 12-month period ending 4 months after the fiscal year-end. In China, listed firms have to release their annual financial statements within 4 months from the fiscal year-end.

Whichever performance measure (OCF vs. NI) has a higher association (R^2) with stock returns is interpreted as more effectively summarizing firm performance or relatively more value-relevant. Alternatively, the coefficients of earnings components are compared to assess the incremental information content of the variables. We estimate the models in two ways: (1) pooled both cross-sectionally and intertemporally and (2) cross-sectionally by year.

3.3. Measurement of discretionary and nondiscretionary accruals

While nondiscretionary accruals are accounting adjustments to operating cash flows as mandated by accounting standard-setting bodies, discretionary accruals are adjustments subject to management discretion. Managers choose discretionary accruals from an opportunity set of generally accepted procedures defined by accounting standard-setting bodies and, thus, discretionary accruals are often used as a measure of managers' earnings manipulation.

We compute total accruals (ACCR) as consistent with previous studies of earnings management (e.g., Dechow, Sloan, & Sweeney, 1995; Jones, 1991).⁶ Operating cash flows (OCF) are measured as the difference between net income (NI) and total accruals.

⁶ $ACCR_t = (\Delta \text{Current asset} - \Delta \text{Cash} - \Delta \text{Short-term lending}) - (\Delta \text{Current liability} - \Delta \text{Short-term borrowing} - \Delta \text{Accrued income taxes} - \Delta \text{Current portion of long-term debt}) - \text{Depreciation} - \text{Amortization}$, where the change (Δ) is computed between time t and $t - 1$.

Discretionary accruals (DAC) are determined using the Jones model used in previous studies (e.g., Han & Wong, 1997; Jones, 1991; Subramanyam, 1996):⁷

$$\text{ACCR}/A_{it-1} = \alpha[1/A_{it-1}] + \beta[\Delta\text{REV}_{it}/A_{it-1}] + \gamma[\text{PPE}_{it}/A_{it-1}] + \varepsilon_{it} \quad (6)$$

where ACCR_{it} = total accruals in year t for firm i , ΔREV_{it} = revenues in year t less revenues in year $t - 1$ for firm i , PPE_{it} = gross property, plant, and equipment in year t for firm i , A_{it-1} = total assets in year $t - 1$ for firm i , and ε_{it} = error term in year t for firm i .

All variables are scaled by lagged total assets to reduce heteroscedasticity. The model is estimated separately for each industry-year (using a two-digit industry code).⁸ Nondiscretionary accruals (NDAC) are defined as the fitted value from Eq. (6):

$$\text{NDAC}_{it} = \alpha[1/A_{it-1}] + \beta[\Delta\text{REV}_{it}/A_{it-1}] + \gamma[\text{PPE}_{it}/A_{it-1}]$$

where α , β , and γ are ordinary least-square estimates. Discretionary accruals (DAC) are defined as the residual:

$$\text{DAC}_{it} = \text{ACCR}_{it}/A_{it-1} - \alpha[1/A_{it-1}] - \beta[\Delta\text{REV}_{it}/A_{it-1}] - \gamma[\text{PPE}_{it}/A_{it-1}].$$

As in prior studies, the level of gross property, plant, and equipment and the change in revenues are included to control for changes in nondiscretionary accruals caused by the change of economic conditions. 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 total accruals and are positively related to changes in revenues. We expect the coefficient for PPE to be negative because higher fixed assets are expected to lead to higher depreciation expense, which reduces total accruals.

4. Sample and descriptive statistics

4.1. Sample

The sample selection starts with the entire population of listed Chinese firms with A-shares on the SZSE and SHSE for 1995–1998. Years prior to 1995 are excluded from our sample because the disclosure of depreciation and amortization expenses was not required until 1995 when the Statement of Changes in Financial Position was mandated. For each of 1995–1998, annual financial statements and the monthly equity prices of the sample firms are obtained from the Taiwan Economic Journal (TEJ) database.

Panel A of Table 1 reports the sample selection procedure. Starting with 3464 firm-year observations available in the TEJ database, the final sample was reduced to 1516 firm-years.

⁷ We also used the *modified* Jones model proposed by Dechow et al. (1995) to estimate discretionary accruals. The results are very similar with those using the Jones model.

⁸ We also estimated Eq. (6) using pooled cross-sectional and time-series regressions for each industry based on two-digit industry code. The results are quite similar with those using the cross-sectional models for each industry-year.

Table 1
Sample selection and distribution

Panel A. Sample selection procedure					
	Number of firm-years				
Total firm-years covered by the Taiwan Economic Journal (TEJ) database, 1995–1998	3464				
Less firm-years:					
with financial statement data missing	(835)				
with stock price data missing at the end of April in each year	(786)				
with fewer than 10 firms in each industry-year	(327)				
Firm-years included in the sample	1516				
Panel B. Sample distribution by stock exchange and year					
Exchange	1995	1996	1997	1998	Total (%)
Shanghai	128	148	218	339	833 (55)
Shenzhen	85	99	192	307	683 (45)
Total	213	247	410	646	1516
Panel C. Industry distribution by year					
	1995	1996	1997	1998	Total
Number of industries	13	13	15	22	63
Average number of firms in each industry-year	16.4	19.0	27.3	29.4	24.1

We excluded 1621 firm-year observations because of the lack of either financial statement data (835) or stock price data (786). We further exclude 327 firm-years because of the insufficient observation available (fewer than 10 firm-years) in each industry-year to estimate nondiscretionary accruals. Since complete financial and market data are not available for all the sample firms for all the 4 years examined, the number of firms analyzed in the study varies from year to year.

Panel B of Table 1 summarizes the sample distribution by year and stock exchange. The sample consists of 833 firm-years listed on the SHSE (55%) and 683 firm-years on the SZSE (45%). Following the rapid expansion of listed firms in China, the number of sample firms increases over time from 213 in 1995 to 646 in 1998. Panel C reports industry distribution by sample year. On average, 24 observations are used in each industry-year for estimating nondiscretionary accruals for a total of 63 industry-years.

4.2. Estimation of nondiscretionary accruals and descriptive statistics

We decompose total accruals into discretionary and nondiscretionary components using the Jones model. For the 63 industry-years, the mean and median coefficients (not tabulated) on ΔREV are 0.090 and 0.075, respectively, and are statistically significant at the .01 level. They are similar with those in the US studies (e.g., Subramanyam, 1996). The mean (median) coefficient on PPE is -0.001 (-0.001), consistent with the predicted negative sign, but is not significant at the conventional level. The lack of significance on the PPE coefficient might

be due to smaller amount of depreciation expenses recognized under PRC-GAAP since it requires the use of straight-line method and longer life period for estimating depreciation. The overall results indicate that the Jones model appears reasonably applicable to the listed Chinese firms.⁹

5. Empirical results

5.1. Descriptive statistics

The means (medians) for the regression variables are reported in Table 2. Net income and operating cash flows are positive. The means (medians) of total accruals (ACCR), discretionary accruals (DAC), and nondiscretionary accruals (NDAC) are, in general, positive for each of the 4 years and the pooled (full) sample. They are inconsistent with those for the US accrual studies (e.g., Jones, 1991; Sloan, 1996), where total accruals are on an average negative. These differences are mainly due to the small amount of depreciation expenses recognized under PRC-GAAP. We also find that the standard deviation (unreported) of net income is 0.081, which is lower than that of operating cash flows (0.149). Thus, net income is less volatile than operating cash flows, which could indicate that inclusion of accruals in reported earnings reduced its divergence. The results are similar with those in the US studies (e.g., Subramanyam, 1996).

Table 3 reports contemporaneous Pearson correlation coefficients between various components of net income. Net income (NI) is positively correlated with each of its components. This is not surprising since net income is merely an aggregation of its components. Operating cash flows (OCF) is negatively correlated with total accruals (ACCR), with mean correlation coefficient of $-.84$, consistent with prior evidence in Dechow (1994), Dechow et al. (1995), and Subramanyam (1996). This negative correlation could arise due to accrual accounting or income smoothing. The correlation between operating cash flows and discretionary accruals is $-.75$, in comparison to that of $-.36$ between operating cash flows and nondiscretionary accruals. Thus, discretionary accounting choices explain a larger portion of the negative correlation between operating cash flows and total accruals than nondiscretionary accruals. While discretionary accruals (DAC) is negatively correlated with nondiscretionary accruals (NDAC) with a mean coefficient of $-.04$, the correlation is not significant at the conventional level. Thus, there is no evidence that listed Chinese firms smoothen income.

To further examine the implications of income smoothing for the persistence and predictability of earnings and operating cash flows, we compute the autocorrelations and

⁹ If the model erroneously classifies nondiscretionary accruals as discretionary, the coefficient on discretionary accruals will be overstated. That is, discretionary accruals may be implied to be informative when they are actually not. The misclassification problem, which is common to earnings management studies, will reduce the power of the tests.

Table 2
Descriptive statistics

	1995	1996	1997	1998	Full sample
<i>N</i>	213	247	410	646	1516
RET	0.019 (-0.078)	0.020 (-0.288)	-0.017 (-0.118)	0.005 (-0.077)	0.004 (-0.097)
NI	0.059 (0.050)	0.050 (0.046)	0.065 (0.064)	0.058 (0.062)	0.059 (0.060)
OCF	0.011 (0.017)	0.016 (0.014)	0.031 (0.022)	0.018 (0.010)	0.020 (0.014)
ACCR	0.048 (0.025)	0.035 (0.011)	0.034 (0.014)	0.041 (0.032)	0.039 (0.024)
NDAC	0.039 (0.019)	0.089 (0.025)	0.028 (0.014)	0.032 (0.021)	0.032 (0.019)
DAC	0.008 (0.002)	0.003 (-0.007)	0.006 (0.002)	0.009 (0.006)	0.007 (0.002)

Reported are mean (median) values of regression variables.

RET is the cumulative annual market-adjusted stock returns measured over 12 months ending 4 months after the fiscal year-end. NI is consolidated net income as defined in the TEJ Database. ACCR is total accruals. OCF is operating cash flows calculated as the difference between NI and ACCR. DAC and NDAC are discretionary accruals and nondiscretionary accruals obtained from the Jones model, respectively. All variables are scaled by lagged total assets.

cross-correlations between the level of current and future net income and operating cash flows. The higher the autocorrelations, the greater the persistence (Collins & Kothari, 1989). The results (not tabulated) indicate that current net income is more positively correlated with 1-year-ahead net income and operating cash flows than current operating cash flows. The Spearman correlation coefficient between current net income and 1-year-ahead net income (operating cash flows) is .76 (.11), which is higher than the correlation coefficient between current operating cash flows and 1-year-ahead net income (operating cash flows) of .20 (.10). This result indicates that net income is more persistent relative to operating cash flows. The median correlation between 1-year-ahead net income and current net income (operating cash flows) is .76 (.20), which is higher than the correlation between 1-year-ahead operating cash flows and current net income (operating cash flows) of .11 (.10). This result is consistent with higher predictability of net income vis-à-vis operating cash flows.

Table 3
Pearson correlation coefficients of earnings components variables

	OCF	ACCR	NDAC	DAC
NI	.2225 (.0001)	.3360 (.0001)	.2682 (.0001)	.2229 (.0001)
OCF		-.8435 (.0001)	-.3583 (.0001)	-.7513 (.0001)
ACCR			.4939 (.0001)	.8486 (.0001)
NDAC				-.0408 (.1121)

N = 1516.

Reported are Pearson correlation coefficients among the variables. The *P* values needed for the coefficients to be significantly different from zero are presented in parenthesis.

NI is consolidated net income as defined in TEJ Database. ACCR is total accruals. OCF is operating cash flows calculated as the difference between NI and ACCR. DAC and NDAC are, respectively, discretionary accruals and nondiscretionary accruals obtained from the Jones model. All variables are scaled by lagged total assets.

5.2. Regression results of returns on earnings and operating cash flows

Table 4 summarizes the results of the pooled and cross-sectional regressions on the relative and incremental information content of earnings and operating cash flows. Panels A and B report results of the simple regressions for testing the relative information content. In Panel A, with net income alone as the explanatory variable, the adjusted R^2 for the full sample is 5.8%. The coefficient on net income is 1.43 and significant at the .01 level. The annual regression results present a similar pattern, but the coefficients appear unstable over time. The explanatory power of net income is higher for 1996 (during the bull market) than for other periods. Panel B presents the results with operating cash flows alone as the explanatory variable. The adjusted R^2 for the full sample is only 0.3%. The regression coefficient is .18, significant at the .05 level. The coefficients in annual regressions are positive but not significant at the conventional levels except for 1998. The explanatory powers of operating

Table 4
Relative and incremental information content of earnings and operating cash flows^a

	Full sample	1995	1996	1997	1998
<i>N</i>	1516	213	247	410	646
<i>Panel A. Regression results of market-adjusted returns on net income</i>					
Intercept	-0.08 (-2.15)**	-0.08 (-2.25)**	-0.41 (-6.71)***	-0.08 (-3.37)***	-0.025 (-1.58)
Net income	1.43 (9.54)***	1.58 (3.64)***	6.55 (9.96)***	0.76 (3.63)***	0.36 (2.53)**
Adjusted R^2	.058	.055	.285	.029	.008
<i>Panel B. Regression results of market-adjusted returns on operating cash flows</i>					
Intercept	0.01 (0.18)	0.001 (0.22)	-0.09 (-1.51)	-0.03 (-1.40)	-0.01 (-0.46)
Operating cash flows	0.18 (2.00)**	0.19 (0.90)	0.65 (1.52)	-0.02 (-0.19)	0.14 (1.65)*
Adjusted R^2	.003	-.000	.005	-.002	.003
<i>Panel C. Regression results of market-adjusted returns on net income and operating cash flows</i>					
Intercept	-0.08 (-2.15)**	-0.09 (-2.28)**	-0.41 (-6.72)***	-0.08 (-3.36)***	-0.02 (-1.53)
Net income	1.43 (9.32)***	1.57 (3.61)***	6.50 (9.81)***	0.82 (3.81)***	0.32 (2.16)**
Operating cash flows	-0.00 (-0.06)	0.17 (0.82)	0.24 (0.66)	-0.14 (-1.17)	0.09 (1.01)
Adjusted R^2	.057	.053	.284	.030	.008

Annual dummy variables are included in each regression for the full sample but their coefficients are not reported in the table for parsimony.

^a Reported numbers are regression coefficients (t value).

* Indicates significance at the .10 level.

** Indicates significance at the .05 level.

*** Indicates significance at the .01 level.

cash flows in the cross-sectional regressions are quite low. In sum, the regressions on earnings alone (Panel A) exhibit substantially higher explanatory powers and coefficients relative to the models with CFO alone (Panel B).

We conducted a likelihood ratio test suggested by Vuong (1989) to determine which model explains more of the dependent variable.¹⁰ The *Z* statistics for the comparison between regressions in Panels A and B indicate that the incremental explanatory power of net income relative to operating cash flows is statistically significant at the .01 level. This evidence is consistent with the hypothesis that net income explains a greater portion of contemporaneous returns than operating cash flows. Consistent with Dechow (1994) and Subramanyam (1996), our results suggest that earnings are more value-relevant than operating cash flows due to the inclusion of accruals in China's emerging capital market.

Panel C tests the incremental information content of net income and operating cash flows in the same multiple regression. The results demonstrate that while the coefficients on net income are positive and, on average, significant at the .01 level, the coefficients on operating cash flows are not statistically significant at the conventional levels. This indicates that net income has incremental information content beyond that provided by operating cash flows, but not vice versa.

5.3. Regression results of returns on earnings and its components

Table 5 examines incremental information content of earnings components in multiple regressions. In Panel A, earnings are decomposed into operating cash flows and total accruals. The coefficients on operating cash flows and total accruals are quite similar for the full and cross-sectional samples. For the full sample, both the coefficients of operating cash flows and total accruals are 1.43 and significant at the .01 level. Their annual coefficients are significantly positive but not statistically different from each other. The evidence suggests that both earnings components are significantly associated with stock returns and that total accruals have incremental information content beyond that provided by operating cash flows. Moreover, the weight attached to the accrual component is similar to the weight attached to operating cash flows. The adjusted R^2 of the model for the full sample is 5.7%, which is substantially higher than 0.3% (Panel B of Table 4) when returns are regressed on operating cash flows alone. Our results are consistent with earlier US studies (Subramanyam, 1996).

Panel B decomposes net income into three parts: operating cash flows, nondiscretionary accruals, and discretionary accruals. For the full sample, the coefficients on operating cash flows, nondiscretionary accruals, and discretionary accruals are 1.40, 1.59, and 1.35, respectively (all are significant at the .01 level). These results suggest that in addition to operating cash flows, both nondiscretionary and discretionary components of accruals contribute to the value relevance of earnings and discretionary accruals provide incremental information over that contained in the nondiscretionary component of earnings. Moreover,

¹⁰ See Dechow (1994) for a discussion of the merits and technical details regarding the Vuong's likelihood ratio test.

Table 5
Incremental information content of earnings and its components^a

	Full sample	1995	1996	1997	1998
<i>N</i>	1516	213	247	410	646
<i>Panel A. Regression results of market-adjusted returns on operating cash flows and total accruals</i>					
Intercept	-0.08 (-2.15)**	-0.09 (-2.28)**	-0.41 (-6.71)***	-0.08 (-3.36)***	-0.02 (-1.53)
Operating cash flows	1.43 (8.96)***	1.73 (3.65)***	6.74 (9.36)***	0.68 (3.11)***	0.41 (2.71)***
Total accruals	1.43 (9.31)***	1.57 (3.61)***	6.50 (9.81)***	0.82 (3.81)***	0.32 (2.16)**
Adjusted R^2	.057	.053	.284	.030	.008
<i>Panel B. Regression results of market-adjusted returns on operating cash flows, nondiscretionary accruals and discretionary accruals</i>					
Intercept	-0.08 (-2.28)**	-0.08 (-2.25)**	-0.40 (-6.43)***	-0.09 (-3.81)***	-0.03 (-1.94)*
Operating cash flows	1.40 (8.73)***	1.82 (3.72)***	6.80 (9.40)***	0.60 (2.77)***	0.38 (2.46)**
Nondiscretionary accruals	1.59 (8.23)***	1.47 (3.26)***	6.13 (7.76)***	1.34 (4.66)***	0.60 (3.00)***
Discretionary accruals	1.35 (8.10)***	1.75 (3.47)***	6.75 (9.36)***	0.60 (2.60)***	0.21 (1.30)
Adjusted R^2	.057	.051	.283	.045	.013

Annual dummy variables are included in each regression for the full sample but their coefficients are not reported in the table for parsimony.

^a Reported numbers are regression coefficients (t value).

* Indicates significance at the .10 levels, respectively.

** Indicates significance at the .05 level.

*** Indicates significance at the .01 level.

the market, on average, does not value differently the discretionary and nondiscretionary components of accruals. For example, the coefficient of discretionary accruals is not statistically different from those of operating cash flows and nondiscretionary accruals for the full sample and for each of 1995 and 1996. On the other hand, while the coefficients of discretionary accruals for 1997–1998 are not statistically different from those of operating cash flows, they are significantly smaller than those of nondiscretionary accruals at the .05 level. Therefore, there is some weak evidence that the weight attached to the discretionary accruals is lower than the weight attached to the nondiscretionary components of earnings in the later years of our sample period. The adjusted R^2 of the model for the full sample is 5.7%, which is similar to that in Panel A with total accruals and operating cash flows as the explanatory variables.

In summary, the results in Table 5 reveal that in China's emerging capital market, accruals have incremental information content beyond that contained in operating cash flows and the market attaches rather similar value to both operating cash flows and accruals. Both discretionary and nondiscretionary components contribute to the value relevance of total

accruals. Discretionary accruals provide incremental information over that provided by nondiscretionary accruals and operating cash flows, but they are priced rather similarly.

Our results imply that China's capital market may be functionally fixated on earnings. We examined this issue further in a manner similar to Sloan (1996). We estimate a pooled regression of current net income on lagged operating cash flows and lagged total accruals (each scaled by lagged total assets). Because of the short history of listed Chinese firms and the use of lagged data, our sample is reduced to 860 firm-years. The coefficients on lagged operating cash flows and lagged total accruals are 0.68 and 0.66, respectively, and both are statistically significant at the .01 level. However, they are not statistically different from each other ($P=.12$), indicating that the persistence of operating cash flows and accruals are similar.¹¹ Such findings suggest that Chinese investors may be correct in attaching similar weights to operating cash flows and accruals. However, such an inference needs to be made cautiously since our sample size is much smaller than those used in prior US studies (e.g., 40,679 firm-years in Sloan, 1996). Results from a larger sample could have indicated that operating cash flows are more persistent than accruals, thus, supporting the functional fixation hypothesis.

6. Conclusion

While earnings is related to security returns of the firm, there is mixed evidence about the usefulness of the accrual components of earnings for firm valuation. On the one hand, the Financial Accounting Standards Board maintains that accruals are useful for assessing share values. On the other hand, some financial analysts question the reliability and relevance of earnings because of its accrual components. They argue that managers tend to manipulate accruals to alter reported earnings through the flexibility accorded under various GAAP.

Prior research (e.g., Dechow, 1994; Subramanyam, 1996) examines the relation of stock returns with accruals and cash flow performance measures. Although they find that the two components of earnings provide different information to the market about future cash flows, their results are consistent with accruals having incremental information content over operating cash flows. These studies are based on findings in mature markets, such as in the United States. There is no empirical evidence based on how the accrual components of earnings are priced in China's emerging capital market. Unlike the case in mature markets, accounting rules in China have no room for discretion in selecting accounting methods and making accounting estimates. Furthermore, China's market is less sophisticated and Chinese investors have limited access to firm-specific information.

Based on a sample of 1516 firm-years for 1995–1998 starting with the entire population of A-share listed Chinese firms, our study examines the relative and incremental information content of accruals in China's emerging capital market. The simple regression results

¹¹ We also run the pooled regression by each industry based on two-digit industry code. Results based on the mean and median of the coefficients are similar with those using the pooled sample.

demonstrate a greater explanatory power when the stock returns are regressed on earnings relative to operating cash flows. While earnings alone explain 5.8% of the variation of annual returns, operating cash flows alone explains only 0.3%. This finding suggests that earnings have greater relative information content over operating cash flows because accruals are included. Our result also indicates that earnings has incremental information content over operating cash flows, but not vice versa. The autocorrelations and cross-sectional correlations suggest that earnings have greater persistence and predictability vis-à-vis operating cash flows.

Multiple regression results show that accruals add information to operating cash flows. We find that discretionary and nondiscretionary accruals have incremental information content over operating cash flows, and, therefore, contribute to the value relevance of earnings. Consistent with the prior studies of the developed capital markets, discretionary accruals are priced in China's emerging market and provide incremental information beyond that contained in the nondiscretionary component of earnings. Unlike the findings in prior studies on mature markets, we find no strong evidence that the value attached to discretionary accruals is lower than the value attached to the nondiscretionary earnings component, even though there is some weak evidence indicating that discretionary accruals have a lower multiplier than nondiscretionary accruals in the later years of our sample period.

Our results imply that domestic investors in China's emerging capital market rely on earnings information more than operating cash flow information in the valuation process. This evidence is consistent with the argument that Chinese investors may not be able to accurately estimate operating cash flows when the cash flow statement was not readily available and hence are functionally fixated on earnings (e.g., Hand, 1989; Sloan, 1996). An alternative interpretation could be that managerial policy choices for the listed Chinese firms are rather limited in selecting accounting methods and making accounting estimates under PRC-GAAP, thus, producing fewer opportunities for earnings management.

Acknowledgments

We would like to thank two anonymous reviewers and A. Rashad Abdel-khalik (the editor) for helpful comments.

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Pergamon

The International Journal of Accounting
36 (2001) 407–421

The
International
Journal of
Accounting

The demand for auditor reputation across international markets for audit services[☆]

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Abstract

Previous research has documented a positive relation between variation in audit fees across countries and specific macroeconomic factors such as a country's level of litigiousness and the level of required disclosure. Such studies have focused on the supply of auditor services using single-equation models. This study examines not only the supply of but also the demand for large-firm auditors across 20 different countries using the simultaneous-equations approach. This approach is used to account for the endogeneity between choice of auditor and audit fees. The results indicate an association between greater disclosure requirements and the choice of a large-firm auditor. They also indicate that increased litigation and regulation are associated with higher audit fees. © 2001 University of Illinois. All rights reserved.

Keywords: Audit fees; Auditing; Litigation; Regulation

1. Introduction

This paper examines the demand for auditor reputation across international markets for audit services. To address this issue, we examine a sample of audit fees across 20 countries that

[☆] This paper was presented at the Illinois International Accounting Summer Conference held in Champaign, IL on June 1–2, 2001.

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vary in their disclosure, litigation, and regulatory environments. We specifically examine the association between country-specific measures of disclosure, litigation, and regulatory burden with the level of audit fees and the demand for auditor reputation. The choice of a large-firm auditor is of interest because previous research has linked auditor size and auditor quality (Colbert & Murray, 1998; Reed, Trombley, & Dhaliwal, 2000). Consistent with some previous studies, the choice of a large-firm auditor is a proxy for auditor reputation (e.g., Simunic, 1980). If it is assumed that clients trade off auditor reputation and agency costs, net of audit costs, then the study of auditor reputation potentially provides information about the factors influencing purchase of large-firm auditors. One potential factor influencing agency costs is the level of disclosure. By considering a large international sample with diversity in disclosure, we are able to consider the impact of disclosure on the choice of a high-reputation auditor.

A considerable amount of research addresses understanding the microeconomic underpinnings of the markets for audit services in individual countries (e.g., Firth, 1985; Simon, 1995; Simon & Taylor, 1997; Simunic, 1980; Taylor, 1997; Taylor, Simon, & Burton, 1999). The vast majority of these studies examine fees from audit engagements conducted in a single country. These studies have not, for the most part, considered the extent to which fees are determined by macroeconomic and other environmental factors that vary across countries.

A few previous studies have examined macroeconomic and other environmental factors that differ across countries. Clarkson and Simunic (1994) utilize differences between Canadian and US legal environments to test the hypothesis that new issuers of securities are more likely to choose a high-quality auditor as firm-specific risk increases. Taylor and Simon (in press) find that increased litigation pressures, institutional traditions of increased disclosure, and increased regulation are associated with higher audit fees using data from 20 countries. Wingate (1994) finds a positive relation between a country's level of litigiousness and audit fees, and between the level of required disclosure and audit fees using a study of data from 10 countries.

This study extends this research by considering the demand for auditor reputation in a global context. Copley, Doucet, and Gaver (1994) and Copley, Gaver, and Gaver (1995) documented the simultaneity between the supply and demand for auditor reputation for the US audit market. This paper considers the simultaneity between the supply and demand for auditor reputation using international data. This approach provides further insight into the effects of litigation pressures, institutional traditions of increased disclosure, and regulation on audit fees using the simultaneous-equations approach.

The results also indicate that the higher the disclosure level for a country, the more likely the choice of a large-firm auditor. By simultaneously estimating the demand and supply of audit services, our results confirm two previous studies of audit fees that indicate higher litigation propensities and higher levels of regulation are associated with higher audit fees. Unlike Copley et al. (1994), we do not find an inverse relation between audit quality and audit fee once endogeneity has been explicitly considered in this context. The remainder of this paper is organized as follows. Section 2 reviews previous literature. Section 3 develops the expectations underlying the expected relationships between auditor reputation, audit fees, and the political/economic variables of interest. Section 4 outlines the sample and methodology. Section 5 discusses the results. Section 6 concludes the paper.

2. Previous research

Beginning with Simunic (1980), a number of studies have examined the market for auditing services in specific countries. Studies have covered the more developed countries such as the US (e.g., Francis & Simon, 1987; Palmrose, 1986), the UK (e.g., Brinn, Peel, & Roberts, 1994; Chen, Ezzamel, & Gwillam, 1993), Australia (e.g., Francis, 1984; Francis & Stokes, 1986), and Japan (Taylor, 1997). More recently, researchers have also examined the market for audit services in other countries including India (Simon, Ramanan, & Dugar, 1986), Hong Kong, Malaysia, and Singapore (Low & Koh, 1990; Simon, Treo, & Trompeter, 1992), New Zealand (Firth, 1985), Canada (e.g., Anderson & Zéghal, 1994; Chung & Lindsay, 1988), Pakistan (Simon & Taylor, 1997), and Bangladesh (Karim & Moizer, 1996). The majority of these earlier studies have served to establish the association between audit fees and variables related to auditee size, risk, and complexity. All of these studies were based on single-country models of audit fees and ignore between-country variation in the accounting environment.

Two recent studies combined observations from different countries in order to assess country-specific effects on audit fees. Wingate (1994) considers the effects of litigation and disclosure policies on audit fees from approximately 600 engagements from 10 countries during the period 1986–1989. Wingate argues that there is evidence of differences in production functions across countries. Taylor and Simon (in press) extend the analysis to consider a more heterogeneous sample with fee data from 20 countries over the period 1990–1995. Taylor and Simon find that higher audit fees are associated with increased litigation pressures, institutional traditions of increased disclosure, and increased regulation. Neither Taylor and Simon nor Wingate considers the demand for audit services or the simultaneity between supply and demand. We extend this line of research to consider the simultaneous estimation of the supply and demand of differentiated audits.

3. Motivation

Previous literature has described the audit as a differentiated product traded in a non-arbitrageable market.² Simunic argues that the principal characteristic of the audit is the identity of the supplier, with the auditor's brand name or reputation being one differentiating attribute (Simunic & Stein, 1987). Unfortunately, existing theory does not provide sufficient insight to allow us to identify either the complete set of endogenous variables that are jointly and simultaneously determined with audit quality, or the exogenous variables which underlie them (Clarkson & Simunic, 1994). A general conceptual model that has been used as a

² Cross-sectional variation in audit and auditor attributes is assumed by Copley et al. (1995), Dopuch and Simunic (1982), Simunic (1980), and Simunic and Stein (1987), among others, and relates to the work on hedonistic markets by Rosen (1974).

representation of the audit market has been expressed in the following form (Copley et al., 1994, p. 247) (Eqs. (1) and (2)):³

$$\text{Quality} = f [\text{client} - \text{demand characteristics, fee}] \quad (1)$$

$$\text{Fee} = f [\text{client complexity, competition, audit bid factors, quality}] \quad (2)$$

The advantage of this model is that it explicitly considers the endogeneity of audit quality and audit fee. The slopes of the demand and supply functions, as captured by the audit quality variable in the demand model and the audit fee variable in the supply model, are pertinent to the debate concerning the competitive nature of audit services. If price competition prevails, the expectation is that the demand for quality with respect to price is downward sloping, while the supply function is upward sloping. Findings of this nature are consistent with a competitive market for a differentiated product. Copley et al. (1995) point out that ignoring endogeneity of audit fees and audit attributes engenders problems of parameter identification and estimation bias, which prevents meaningful interpretation of variable coefficients. In the system of audit-fee and audit-quality equations, the dependent variables fee and audit quality are also independent variables. The basic econometric issue is that in a single-equation fee model that includes the endogenous variable audit quality as an independent variable, that endogenous variable is not independent of the error term.⁴

A disadvantage of this type of model is that little theory is available to identify specific client-demand characteristics or client-complexity characteristics. Further, little guidance is available to unambiguously separate demand characteristics from supply characteristics. That is, many audit-client characteristics could be considered common to both the demand and supply equations. The choice of variables included as client-demand characteristics and the choice of variables to be included in the auditor's cost function are relatively arbitrary. To estimate the equations, it is necessary to include at least one identifying characteristic in the demand equation. Consistent with previous studies using simultaneous models of audit fee and audit quality, our proxy selections are relatively arbitrary and the results must be interpreted with respect to this limitation.

3.1. Demand for auditor reputation

Models of the demand for auditing services focus on the demand for auditor reputation (e.g. Copley et al., 1995) or quality (e.g. Copley et al., 1994) as a differentiating attribute. Copley et al. (1995) focus on the client's need to purchase the services of an independent auditor and assume that the level of auditor reputation demanded is determined by the reduction in agency cost. That is, audit clients have characteristics that create cross-sectional variation in the demand for auditor reputation. Thus, the client trades off auditor reputation

³ Consistent with previous work, we use quality and fees as the dependent variables, though we readily acknowledge that this line of research has abstracted considerably from the standard economic formulation of the analysis of prices and quantities that would suggest the analysis of marginal fees.

⁴ Refer to Kennedy (1989, p. 126) for a description of the general problem.

and agency costs net of audit costs. Consistent with other studies of auditor reputation, we use the choice of a large-firm auditor as a proxy for auditor reputation.

The empirical tests of these models use client-specific variables to control for differences in agency costs. Copley et al. (1994) model audit quality as a function of firm size, audit fee, and specific governmental variables. For auditee size, we use $\ln(\text{Assets})$, the natural log of the client's assets. Copley et al. (1995) focus on variables that mitigate a firm's agency costs. For example, interest costs can be reduced and credit ratings increased by enhancing the credibility of financial statements. Leverage, auditee total long-term debt divided by total assets, is used as a proxy for the extent of auditee debt.

The data also allow us to consider factors that vary across countries and that could account for shifts in the demand for audit quality. One such factor is variation in disclosure level across countries. Audit clients in countries requiring relatively more disclosure are expected to choose a high-reputation auditor. That is, audit clients needing higher levels of disclosure would also demand a higher level of assurance regarding those disclosures. However, to the extent that auditor reputation can substitute for high-quality disclosure, this prediction might not hold and, hence, an empirical test is required.

Another factor that can potentially influence the demand for auditor reputation across countries is the level of development within each country. To the extent that countries have a developed economy, we would expect that complex legal and regulatory requirements have evolved. Demand for high-quality audits is expected in more developed countries because of the sophistication of audit procedures required. We therefore expect that countries with more developed economies would tend to have a higher proportion of audits conducted by large, international audit firms. We use gross domestic product (GDP) per capita to capture this effect.⁵ To the extent that this proxy captures a variety of influences that vary between more and less developed countries, our results must be interpreted with respect to this limitation.

3.2. *Fee model*

Following previous research, we control for individual client characteristics through the following variables. For auditee size, we use $\ln(\text{Assets})$, the natural log of the client's assets. The principal audit-complexity variable, *Invrec*, represents the proportion of auditee total assets in inventory and receivables. *SqSubs*, the square root of the number of the client subsidiaries is used as an audit-complexity variable (Simunic, 1980).

Loss, an indicator variable whose value is one if an auditee experienced a loss in the current or previous year and zero otherwise, is utilized as a measure of risk. In addition to the size, complexity, and risk variables, we also employ variables that previous research has determined are systematically related to audit fees and that control for the industry in which the client operates. Financial, Utility, and Mining are indicator variables whose value is one if the auditee's SIC is in the financial institution, utility, or mining industry, respectively, and

⁵ We also considered measures of labor costs (from World Bank statistics) but we found labor costs to be highly correlated with per capita GDP (Spearman correlations of approximately .80) and provided no additional explanatory power beyond the inclusion of GDP.

zero otherwise.⁶ Finally, we include an indicator variable, *Big6*, which has a value of one if the audit was performed by a Big 6 (now Big 5) firm and a value of zero otherwise.

We expect the coefficients on $\ln(\text{Assets})$, *Invrec*, *SqSubs*, and *Loss* to be positive. For example, *ceteris paribus*, larger auditees (as measured by total assets) will require more audit effort and result in higher fees. In addition to these size and risk factors, certain assets require more audit effort and hence, lead to higher audit fees; in particular, receivables and inventory typically require more effort for a given level of dollars to be audited than other assets. Auditees that have relatively more subsidiaries are also expected to have higher fees. Based on research that has determined that fees are lower for financial institutions, utilities, or mining operations (e.g., Simon, 1995; Simunic, 1980; Turpen, 1990), we expect the coefficients on *Financial*, *Utility*, and *Mining* to be negative. Finally, as previous research has shown that the large international audit firms are able to command a fee premium from clients engaging their services (see, e.g., Simon & Taylor, 1997; Simunic, 1980), we expect the sign of the *Big6* coefficient to be positive.

Following Taylor and Simon (in press), we include three macroeconomic variables: litigation propensity, disclosure, and regulation. Other things equal, more intense litigation pressures are expected to lead to higher audit fees. To measure the extent of litigation pressure in a given political/economic environment, we obtained a litigation index provided by a leading insurance brokerage firm, which maintains the litigation index for purposes of pricing insurance premiums for large international accounting firms in countries across the world. The index (*Lit*) is based on several environmental and political factors, which affect the likelihood of litigation against audit firms. The index has a range of 0–10, is calculated individually for a portfolio of about 110 countries, and is updated annually.⁷

Loss exposure can be expected to increase the greater the complexity of the financial reporting system. One indication of that complexity is the average relative extent of disclosure that accompanies firms' financial statements in a given political/economic system. Previous research has shown that different accounting regimes have varying intensity and extent of disclosure of "notes to financial statements." (e.g., CIFAR, 1995). We expect that in financial reporting environments in which disclosure is relatively more extensive, audit fees would increase accordingly. The Center for International Financial Analysis and Research (CIFAR) has developed an index of international financial disclosure by examining annual reports for approximately 1000 companies from 44 countries with respect to the companies' reporting or nonreporting of 90 items subdivided into seven categories. The index, which we label *Disc*, is a continuous variable with a potential range from 1 to 90. We expect the sign on this variable to be positive.

⁶ Auditees with SIC codes in the ranges 1000–1299, 4900–4999, 6000–6999 are assigned a value of one to the *MINING*, *UTILITY*, and *FINANCIAL* indicator variables, respectively.

⁷ The premium distribution formula does not include an observation for the US. However, based on discussions with the project administrator, a value of 10 has been assigned to the US. Sensitivity analysis indicates that the results are robust with respect to alternative values (all at the upper end of the range) assigned to the US. We also estimated litigiousness using the number of lawyers per 10,000 of population (as used by August, 1993) and the results were consistent with those reported here.

Another potentially important environmental factor that may affect audit fees is the overall extent of regulation of the process of financial reporting and audit services. Typically, regulation imposed by authoritative bodies increases the cost of the activity being regulated and the intensity of that regulation varies depending on the political and economic environment in which the activity is being conducted. We employ Reg, a measure of the intensity of such regulation as developed and reported in Cooke and Wallace (1990). Reg is a continuous variable ranging from 0 to 4.

3.3. Empirical model

Based on the foregoing, we specify the auditor reputation and fee functions as follows:

$$\text{Big6} = \alpha + \beta_1 \ln(\text{Assets}) + \beta_2 \text{Leverage} + \delta_1 \text{Disc} + \delta_2 \text{GDP} + \delta_3 \ln(\text{Fee}) + \varepsilon_1 \quad (3)$$

$$\begin{aligned} \ln(\text{Fee}) = & \alpha + \beta_1 \ln(\text{Assets}) + \beta_2 \text{Invrec} + \beta_3 \text{Loss} + \beta_4 \text{Financial} + \beta_5 \text{Utility} \\ & + \beta_6 \text{Mining} + \beta_7 \text{Sqsubs} + \delta_1 \text{Disc} + \delta_2 \text{Lit} + \delta_3 \text{Reg} + \delta_4 \text{Big6} + \varepsilon_2 \end{aligned} \quad (4)$$

where the variables are as defined in Table 1.

Table 1
Definition of variables

Big6	An indicator variable taking the value one if the auditor is a Big 6 auditor, and zero otherwise.
ln(Fee)	Natural log of annual audit fees (in millions) from Global Vantage, proxy statements, or <i>Moody's International</i> manual.
ln(Assets)	Natural log of total assets (in millions) from annual reports.
Leverage	Auditee financial leverage calculated as the total book value of long-term debt divided by total book value of assets from the financial statements.
Lit	A litigation index provided by a leading insurance brokerage firm, that maintains the litigation index for purposes of pricing insurance premiums for large international accounting firms in countries across the world. The index has a range of 0–10, is calculated individually for a portfolio of about 110 countries, and is updated annually.
Disc	The CIFAR index of international financial disclosure. The index is continuous with a range from 1 to 90.
GDP	The per capita GDP for the country.
Loss	An indicator variable for a current-year financial-statement loss.
Financial	An indicator variable taking the value one if a firm is a financial institution, and zero otherwise.
Utility	An indicator variable taking the value one if the firm is a utility, and zero otherwise.
Mining	An indicator variable taking the value one if the firm has mining operations, and zero otherwise.
Subs	The number of subsidiaries is reported in Table 2. The square root of the number of subsidiaries is used in the subsequent analysis. Hence, the variable in Eq. (4) is labeled Sqsubs.
Leverage	Financial leverage ratio. A single leverage ratio above 2.0 was set to 2.0 to mitigate the potential impact of this outlier on the analysis.
Invrec	Represents the proportion of auditee total assets in inventory and receivables. Two ratios above 2.0 were set to 2.0 to mitigate the potential impact of these outliers on the analysis.
Reg	Measures the intensity of such regulation as developed and reported by Cooke and Wallace (1990). REG is a continuous variable ranging from 0 to 4.

Fee and Big6 are jointly determined endogenous variables. Ordinary least squares (OLS) is inappropriate for estimating these equations because $\ln(\text{Fee})$ and Big 6 are correlated with ε_1 and ε_2 leading to inconsistent estimates. To avoid these biases, we used a two-stage procedure described below.

4. Sample

The sample comprises 796 observations from audit engagements in 20 different countries for the year 1994. Approximately half of the observations on fees in our sample came from Standard and Poor's Global Vantage (SPGV) database. This data source was first augmented by observations obtained from annual reports for countries where audit fees are required disclosure but were not included in the SPGV database. For the seven countries in our study in which audit fees are not required disclosure, fee data were obtained from proxy statements (US) or questionnaires (Canada, Chile, Japan, Korea, Mexico, and Spain).

One of the problems associated with combining observations on financial statement items from individual countries into one data set is differing monetary units. To address this problem, we converted all monetary figures to US dollars. Income statement items were converted using a 12-month moving average exchange rate; balance sheet items were converted using the exchange rate as of the date of the respective item being converted. Exchange rates were obtained from the SPGV database.

Table 2 presents descriptive statistics for the variables used in this study. Significant variation is evident for most of the variables in Table 2. The distributions of the size and audit-fee variables are highly skewed. To reduce the impact of outliers on the residuals, the

Table 2
Descriptive statistics

Variable	Mean	Median	Standard deviation	Minimum	Maximum
Fees	0.725	0.146	1.674	0.001	18.200
Big6	0.741	1.000	0.438	0.000	1.000
Litigation	5.416	4.240	2.616	1.270	10.000
Disclosure	70.694	72.000	6.693	52.000	79.000
GDP per Capita	1.340	1.473	1.106	0.025	3.680
Regulation	2.819	2.98	0.442	0.700	3.450
Assets	3,298	325	14,876	0.110	250,489
Leverage	0.149	0.080	0.508	0	2.0
Invrec	0.293	0.281	0.236	0	2.0
Loss	0.148	0	0.355	0	1
Financial	0.165	0	0.371	0	1
Utility	0.289	0	0.167	0	1
Mining	0.020	0	0.140	0	1
Subsidiaries	3.360	3.0	2.809	0	22.36

The sample consists of 796 audits across 20 countries. Log of fees and log of assets are used in all subsequent analyses. Fees and assets are in millions of US dollars.

Table 3
Mean of key variables by country^a

Country	Number	Fees	Big6	Disc	GDP per capita	Reg
Australia ^b	74	1.08	0.81	78	1.85	2.45
Canada ^c	15	0.46	1.00	70	1.86	3.27
Chile ^c	10	0.01	0.90	65	3.34	2.51
Great Britain ^b	90	0.58	0.67	79	1.75	3.24
Hong Kong ^b	58	0.39	0.79	73	2.26	2.98
India	43	0.01	0.30	52	.03	2.48
Ireland ^b	25	0.56	0.96	74	1.47	3.24
Japan ^c	52	0.34	0.77	70	3.68	2.54
Korea ^c	39	4.90	0.77	68	0.85	3.04
Malaysia ^b	64	0.14	0.73	74	0.36	2.49
Mexico ^c	8	0.29	0.63	65	0.40	3.19
New Zealand ^b	22	0.39	0.95	71	1.47	2.60
Nigeria	17	0.04	0.53	64	0.04	2.80
Pakistan	58	0.01	0.41	61	0.04	3.01
Singapore ^b	60	0.26	0.95	73	2.36	2.98
South Africa ^b	77	0.48	0.75	72	0.28	3.03
Spain ^c	14	0.12	0.93	65	1.32	0.70
Sri Lanka	29	0.01	0.66	65	0.07	2.09
United States ^d	35	3.01	0.97	72	2.55	3.45
Zimbabwe	6	0.68	1.00	66	0.05	3.03
Overall mean	796	0.73	0.74	70.69	1.34	2.82

^a The litigation index cannot be reported by country due to a confidentiality agreement with the provider of that index.

^b Source of fee data is SPGV Software.

^c Source of fee data is responses to questionnaires sent by the authors to a sample of firms in countries which were listed in *Moody's International Manual*.

^d Source of fee data is voluntary disclosures of audit fees by US firms in proxy statements filed with the U.S. Securities Exchange Commission.

log of size and the log of audit fees are used in the subsequent analysis. Consistent with most prior studies of audit fees (e.g. Craswell & Francis, 1999; Simunic, 1980), we use the square root of the number of subsidiaries to capture the nonlinear relation between the number of subsidiaries and fees. Table 3 presents the descriptive statistics of the macroeconomic variables by country.

5. Results

Table 4 presents single-equation estimates of the auditor-reputation model (Eq. (3)) and the audit-fee model (Eq. (4)). These initial estimates ignore the endogeneity between the two equations, but facilitate a more direct comparison to previous research. Panel A of Table 4 presents the results estimating the auditor reputation model using a single-stage Probit estimation. The overall model is significant with a pseudo R^2 of 9.56%. The coefficient on the

Table 4

Single-equation estimation of the demand function for auditor reputation and the auditor-fee function

Panel A: Probit estimation of the demand equation

$$\text{Big } 6 = \alpha + \beta_1 \ln(\text{Assets}) + \beta_2 \text{Leverage} + \delta_1 \text{Disc} + \delta_2 \text{GDP} + \delta_3 \ln(\text{Fee}) + \varepsilon_1$$

Variable	Predicted sign	Coefficient	χ^2 statistic	<i>P</i> value, Pr > Chi
Intercept	.	-.944	-1.598	.2062
ln(Assets)	+	.064	3.472	.0624
Leverage	+	.066	0.050	.8228
Disclosure	+	.019	4.116	.0425*
GDP	+	.093	2.775	.0958
ln(Fee)	-	.090	7.833	.1199
<i>n</i>		796		
Pseudo <i>R</i> ²		9.56		

Panel B: OLS estimation of the audit-fee equation

$$\ln(\text{Fee}) = \alpha + \beta_1 \ln(\text{Assets}) + \beta_2 \text{Invrec} + \beta_3 \text{Loss} + \beta_4 \text{LTDebt} + \beta_5 \text{Financial} + \beta_6 \text{Utility} + \beta_7 \text{Mining} + \beta_8 \text{Sqsubs} + \delta_1 \text{Lit} + \delta_2 \text{Disc} + \delta_3 \text{Reg} + \beta_8 \text{Big6} + \varepsilon_2$$

Variable	Predicted sign	Coefficient	<i>t</i> statistic	<i>P</i> value
Intercept	.	-13.869	-18.144	.0001**
ln(Assets)	+	0.626	21.532	.0001**
Invrec	+	1.827	7.952	.0001**
Loss	+	0.183	1.311	.1902
Financial	-	-0.742	-5.252	.0001**
Utility	-	-0.855	-2.882	.0041**
Mining	-	-0.718	-2.047	.0410*
Sqsubs	+	0.077	3.572	.0004**
Litigation	+	0.137	4.594	.0001**
Disc	+	0.064	5.386	.0001**
Reg	+	0.669	5.855	.0001**
Big6	+	0.276	2.377	.0177*
Adj. <i>R</i> ²		66.3		
<i>n</i>		796		

* Significant at the alpha level of 5%, one-tailed test.

** Significant at the alpha level of 1%, one-tailed test.

disclosure index is positive and significantly greater than zero. The choice of a large-firm auditor is positively related to the amount of disclosure. The coefficient on GDP per capita is positive but only significant at the 10% level. The coefficients on assets and fees are not significantly different from zero at conventional levels. This lack of significance could potentially be explained by the high correlation between size and fees, and the resulting multicollinearity. The impact of multicollinearity in the data is discussed below.

Panel B of Table 4 provides estimates of the audit-fee function using the OLS estimation typically used in previous research. The fee model explains approximately 66% of the variation in fees. Consistent with previous research, we find that fees are an increasing function of auditee size, inventories and receivables, number of subsidiaries, and large-firm

auditors. Also, fees are significantly lower for utilities, financial, and mining firms. We also find that fees are higher for countries with higher disclosure requirements, higher perceived incidence of litigation, tendencies toward more regulation, and the choice of a Big 6 auditor. These results are consistent with the findings of Taylor and Simon (in press) and Wingate (1994).

We estimated the simultaneous model using a two-stage model (Heckman, 1978; Maddala, 1996). This method utilizes a two-stage approach to account for the endogeneity between audit fees and the choice of auditor. The exogenous variables are used as instruments in the

Table 5
Simultaneous estimation of the demand function for auditor reputation and the auditor-fee function

Panel A: Demand equation^a

$$\text{Big 6} = \alpha + \beta_1 \ln(\text{Assets}) + \beta_2 \text{Leverage} + \delta_1 \text{Disc} + \delta_2 \text{GDP} + \delta_3 \ln(\text{Fee}) + \varepsilon_1$$

Variable	Predicted sign	Coefficient	Z statistic	P value (one-tailed)
Intercept	.	- 1.191	- 1.078	.1405
ln(Assets)	+	0.073	1.420	.0778
Leverage	+	0.081	0.275	.3916
Disclosure	+	0.021	1.801	.0358*
GDP	+	0.093	1.550	.0605
ln(Fee) ^b	-	0.074	1.176	.1199
<i>n</i>		796		
Pseudo <i>R</i> ²		8.86		

Panel B: Audit fee equation

$$\ln(\text{Fee}) = \alpha + \beta_{1\ln} \ln(\text{Assets}) + \beta_2 \text{Invrec} + \beta_3 \text{Loss} + \beta_4 \text{LTDebt} + \beta_5 \text{Financial} + \beta_6 \text{Utility} + \beta_7 \text{Mining} + \beta_8 \text{Subs} + \delta_1 \text{Lit} + \delta_2 \text{Disc} + \delta_3 \text{Reg} + \beta_8 \text{Big6} + \varepsilon_2$$

Variable	Predicted sign	Coefficient	<i>t</i> statistic	P value
Intercept	.	- 16.004	- 6.666	.0001
ln(Assets)	+	0.721	7.668	.0001**
Invrec	+	1.968	7.416	.0001**
Loss	+	0.405	1.604	.0546
Financial	-	- 0.824	- 5.093	.0066**
Utility	-	- 0.767	- 2.486	.0194*
Mining	-	- 0.729	- 2.070	.1966
Sqsubs	+	0.597	2.199	.0141*
Litigation	+	0.150	4.616	.0001**
Disc	+	0.086	3.619	.0002**
Reg	+	0.589	4.293	.0001**
Big6	+	1.506	0.890	.1868
Adj. <i>R</i> ²		66.5		
<i>n</i>		796		

^a The simultaneous-equation probit model, using a two-stage least-squares estimation procedure. Statistics are calculated using the asymptotic standard errors. The covariance between the residuals of the two equations is 0.06.

^b The value of ln(Fee) predicted by the first-stage model. See Table 1 for description of other variables.

** Significant at the alpha level of 1%, one-tailed test.

first stage to predict the probability of a large-firm auditor and fees, respectively. These predicted variables are then used in the second stage.

Table 5 provides estimates using the simultaneous-equations model. The results are generally consistent with the single-equation estimates. Panel A of Table 5 presents the estimates for the auditor reputation model. The overall model is significant with a pseudo R^2 of 8.86% for the two-stage model. The coefficient on the disclosure index is positive and significantly greater than zero at a 5% level of significance. The coefficient on GDP per capita is positive but only significant at an alpha level of 10%. The finding that the choice of a large-firm auditor is positively related to the amount of disclosure in the country of interest is robust to adjustment for the endogeneity of fees and quality.

Panel B of Table 5 provides estimates of the audit-fee function. The fee model explains approximately 66% of the variation in fees. Consistent with previous research, we find that fees: (a) are an increasing function of auditee size, inventories, receivables, and the number of subsidiaries and (b) are significantly lower for utilities and financial firms. We also find that fees are higher for countries with higher disclosure requirements, higher propensities for litigation and regulation. The results do not support the conclusion that fees are an increasing function of large-firm auditor or financial statement loss. With the exception of the results associated with the large-firm auditor, these results indicate that the simultaneous-equations specification does not generally alter the findings obtained by OLS Taylor and Simon (in press) and Wingate (1994). Unlike the Copley et al. (1995) findings using US data, we do not find that audit fees are inversely related to audit quality once the endogeneity between fees and quality is explicitly modeled.

5.1. Sensitivity analysis

We also estimated the single-stage models using a fixed-effects specification. Indicator variables were included to capture a separate intercept for each of the countries. Indicator variables cannot be included for all 20 countries because the country-specific rankings and the country dummies can be combined to result in a variance–covariance matrix that is not of full rank and therefore only 16 indicator variables were included. The coefficient on disclosure was not significantly different from zero with inclusion of the country indicator variables. This result indicates that the country-disclosure score cannot be readily separated from the country differences per se in explaining choice of large-firm auditor.

We also considered litigation as a possible determinant of the choice of a large firm. Previous analytical research (e.g., Schwartz, 1997; Smith & Tidrick, 1997) suggests that legal liability can induce a higher audit quality. If greater legal liability results in a higher quality of audit, this suggests that the Big 6 firms have a competitive advantage in litigious environments. On the other hand, other things equal, more intense litigation pressures would be expected to lead to lower participation by auditors with deep pockets. We did not find the litigation or regulation indexes to be significant in explaining variation in the choice of a Big 6 auditor.

The inferences reported above are somewhat conservative in that the high correlation between variables in our sample potentially result in inflated variances and understated test statistics for the explanatory variables due to multicollinearity. Kennedy (1985) indicates that

a condition index greater than 30 indicates strong collinearity. Linear models of the choice of large-firm auditor (Panel A of Tables 4 and 5) yield condition indexes greater than 30. The insignificant test statistics on the total assets, GDP, and fee (predicted fee in Table 5) variables could potentially be attributed to multicollinearity. While multicollinearity can potentially lead to inflated variances and therefore a lack of significance with respect to some test statistics, the multicollinearity cannot account for the significant test statistics reported.

5.2. Limitations

Concerns persist that highly competitive markets for audit services could result in impaired auditor independence, audit quality, and auditor credibility. Deis and Hill (1998) point to two particular issues regarding the related research: the unavailability of measures of ex post audit quality, and the general failure to model both the demand and supply sides of the market for audit services. We have attempted to mitigate the bias by simultaneously estimating both the demand and supply sides of the market for audit services. Future research is needed, however, to consider better measures of audit quality in an international context. Just as studies in the US evolved to use more specific proxies for audit quality (e.g., Copley et al., 1995; O'Keefe, King, & Gaver, 1994; O'Keefe & Westort, 1992), there is a similar need for development of these studies in a global context.

6. Conclusions

Previous research examining cross-country variation in audit fees has not explicitly considered the endogeneity between the demand and supply of audit quality documented using US data by Copley et al. (1994). We extend previous research comparing audit fees across countries to consider both the demand and supply of audit quality. We explicitly consider that audit quality and audit fees are mutually determined by the interaction between the client's demand for, and the audit firm's supply of, audit quality.

We find that disclosure characteristics are an important determinant of the choice of large-firm auditor. The choice of a large-firm auditor is positively related to the amount of disclosure in a given country. Our results also confirm previous findings that audit fees are higher in countries with higher litigation propensity and more extensive regulation. In particular, we find that these previous results are unchanged when simultaneity of fees and auditor reputation is considered.

Acknowledgments

The authors express their appreciation to the Aon Corporation which provided the data on the litigation variable used in this study. We would also like to acknowledge helpful assistance from Barry Mathews, Rona Davis, Bruce Blonigen, Ken Gaver, Julia D'Souza, Mike Stein, and two anonymous referees.

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Pergamon

The International Journal of Accounting
36 (2001) 423–428

**The
International
Journal of
Accounting**

Discussion of Fargher, Taylor, and Simon's “The demand for auditor reputation across international markets for audit services”

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Multicountry studies of audit markets are potentially a valuable source of insights into the efficacy and efficiency of alternative institutional arrangements governing the production and exchange of audit services. Consequently, I approached the Fargher et al. (2000) (hereafter FTS) paper with a fairly sympathetic attitude. Since there is now a large body of research literature in the area of international audit markets, it is useful to review the challenges and opportunities for the area as a whole before assessing the contribution this study makes.

1. Audit markets and industrial organization economics (IO) research

The size and scope of the literature FTS review suggests international audit-markets research has reached a relatively mature phase. Consequently, research choices that sufficed in the early days when less was known or understood may no longer be palatable. Over the last 30 years, IO, the mother discipline for much of audit-markets research, has faced similar challenges.¹ In response, economists have learned to pay close attention to institutional differences across markets and to the often subtle impact of rules of the game on game outcomes. The increasing use of formal theoretical modeling and careful structural estimation methods in IO research reflects the need to address potential threats to the reliability of inferences that may be drawn from empirical work.

¹ Schmalensee (1982) provides a useful perspective on the evolution of IO research (see also Jacquemin, 1987). The roots of empirical audit-markets research can for the most part be traced to a handful of papers (a partial list would include: Danos & Eichenseher, 1982; Dopuch & Simunic, 1980; Simunic, 1980; Zeff & Fossum, 1967). The industrial organization connection in these early papers on audit markets is reflected not only in the tenor of the exposition in these studies but also from citations to key works of modern industrial organization thought: Bain (1956), Lancaster (1966), Rosen (1974), Stigler (1958, 1964, 1968), and Weiss (1972, 1974).

I believe the recent history of IO has important parallels to and lessons for audit-markets research. Audit markets are complicated and diverse institutions. While audit-markets research faces many of the same challenges as IO research in general, both the nature of auditing and the complexity and variety of institutional arrangements affecting audit markets make international research in audit markets particularly challenging.²

Like other service outputs, the quantity of auditing demanded by a client is in some fundamental sense, essentially binary. Audit hours or audit firms' input utilization choices are not publicly visible except in a highly aggregated form. Demand is often indivisible because regulators and exchanges formally restrict the responsibility for the audit to a single provider (e.g., in the United States). Audit fees are unobservable in some countries. Auditors' obligations and auditor liability rules, the effectiveness and speed of the legal process by which auditors are held responsible for audit failures, the ability to settle cases out of court, and the stringency with which capital market regulators scrutinize auditor conduct all vary considerably across countries as well.

Each of these factors potentially affects auditors' incentives and (therefore) managers' and financial statement users' demand for audit quality. The capacities of audit firms and rules on clientele sizes affect market outcomes as well.³ These differences in institutional settings and rules mean that the information content of auditor switches and, therefore, the nature of auditor–client relationships probably varies a lot across countries and most likely depends on client characteristics, the age of the relationship, and competitive conditions as well as macroeconomic factors.⁴

In sum, the complexity of audit markets certainly calls for statistical methods that can handle the simultaneity between various market outcomes (fees, quality, labor hours). Hence the use of two-stage regression approaches in data analysis (as in FTS) is an excellent approach. However, a satisfactory structural approach also requires that the equations being estimated be derived from some well-specified picture of how the world works. In other words, without careful model specification, it is not possible to make reliable causal inferences even when the appropriate statistical framework is used.

2. FTS's contribution

FTS examine the determinants of the demand for auditor reputation based on 1994 data from 796 audits conducted across 20 countries. I agree with FTS that intuitively, macro-

² What follows is best read as only a partial characterization of the complexity of the audit environment.

³ For example, how does the rule prohibiting members of the Institute of Chartered Accountants of India from having more than 30 publicly traded clients affect the mix of clients in an Indian audit firm?

⁴ For example, supplier concentration and hence the base rates at which one would expect large firms in different countries to hire large firm auditors varies enormously across economies. In addition, firms represented in Global Vantage or similar databases tend to be of greater interest to international investors and may have different base rates than a more representative sample of firms from those countries. Hence controlling for base rates is essential for identifying reputation effects in the demand for large auditors.

economic factors such as litigation burdens, regulatory burdens, and disclosure burdens ought to influence investors' demand for audit quality and auditor reputation. If so, it seems to make a lot of sense to add an auditor-choice equation to the basic fee model studied in Taylor and Simon (TS, 1999) and reestimate a simultaneous-equation model for fees and auditor choice using the same or closely similar data. Initially, therefore it seemed there was little for me to say. A closer reading of the paper, however, raised a few concerns which I have grouped together in two lists, one on expository matters and the other on research design.

2.1. Exposition issues

In general, I would have liked to see a more careful development of the key contributions of the paper, a richer motivation of key explanatory variables, and greater discussion of crucial research choices. Specifically, the authors could be much more explicit about

1. The precise contribution of this study: the introduction claims that the paper will extend prior knowledge but leaves unspecified how.
2. The link between key explanatory variables (disclosure level, litigiousness, and regulatory burden) and the dependent variable. For instance, FTS motivate the inclusion of disclosure levels, a key variable in Eq. (3), as follows:

Audit clients in countries requiring relatively more disclosure are expected to choose a higher reputation auditor. That is, clients needing higher levels of disclosure would also demand a higher level of assurance regarding disclosure. However to the extent that auditor reputation can substitute for higher quality disclosure this prediction might not hold, hence an empirical test is required.

It would have been very helpful and instructive for the authors to explain at greater length the link between disclosure levels and demand for levels of assurance. Given the two possibilities identified in their exposition, it is not immediately obvious to me why I would expect the same relationship to hold for all countries. If, for instance, disclosure and reputation are complements in half the countries studied and substitutes in the other half, a regression model that does not distinguish between the two groups of countries might find no significant results even when there are in fact strong (but not unidirectional) links between the explanatory and dependent variables. Even if we were to find statistically significant results, absent a theory that led us to expect homogeneity among the 20 countries, what economic meaning would we attach to the results?⁵

3. Why they (the authors) used only 1 year of data (in contrast to TS who used 5) and whether these results would be replicated if they had used some other year or years of data.
4. How one should relate or contrast their conclusions based on a study of audits of publicly traded corporate entities to conclusions from prior research based on studies of federal or municipal audits (Copley et al., 1994, 1995).

⁵ Similar arguments apply to the other key variables that the authors tested but did not find to be significant.

5. How their results can be reconciled or contrasted with prior results suggesting alternative explanations for the hiring of large-firm auditors (e.g., Doogar & Easley, 1998; Willenborg, 1999).

2.2. *Research design issues*

1. FTS operationalize the demand for audit reputation as the choice to hire a large-firm auditor. The literature offers multiple competing explanations for such a choice. The most commonly cited hypotheses are that (1) large audit firms provide higher quality audits (DeAngelo, 1981), (2) consumers desire a branded product (Klein & Leffler, 1981), (3) large audit firms enjoy economies of scale and can pass on to clients cost savings from industry specialization (Dopuch & Simunic, 1980), (4) larger audit firms have deeper pockets and therefore provide greater insurance (DeAngelo, 1981; Willenborg, 1999), (5) capacity constrained price competition precludes smaller firms from cost-effectively auditing larger clients (Doogar & Easley, 1998) and (6) a little bit of any or all of the above. Consequently, unlike FTS, I have some difficulty in concluding that the hiring of a large-firm auditor represents a demand for audit quality.
2. The authors conclude the hypothesis-development section with the caveat that there is little theory available to guide them and the variables chosen are essentially arbitrary (FTS, p. 5). I believe their remark could also be stated as “Audit markets are complex objects and a multitude of factors can reasonably be expected to affect market outcomes and conduct.” In other words, instead of there being too little theory, there is too much theory: too many things can reasonably be conjectured to affect the demand for auditor quality and reputation. Such complexity does pose a challenge to the researcher and it therefore seems reasonable to control for as many factors as possible in estimating Eq. (3). The next two points relate to this issue in greater detail as well.
3. In Eq. (3), the dependent variable is probability of selecting a large-firm auditor. This probability is simply the market share of those auditors in the sample. We know from prior work that (a) capacity commitment and price competition do matter in determining large-audit-firm market shares (at least they do in the U.S. market), (b) firm shares are sticky, and (c) clients change auditors infrequently. In light of these empirical regularities, I am not sure what to make of Eq. (3), which, as specified, seems to suggest that neither auditor tenure nor past Big 6 market shares matter in determining Big 6 market shares today.
4. The authors are silent on factors that could mediate the relationship between their macroeconomic variables of interest and the choice of a more (less) reputable auditor. Without considering mediating factors, FTS do not give their hypothesized variables a fair shot at explaining auditor choice. Mediating factors and controls using publicly available data that could be added to Eq. (3) to address some of the concerns raised in points 2 and 3 above might be:
 - a. Types of legal regimes (common law or code law),
 - b. Types of liability regimes (loser pays vs. each party bears its own costs),
 - c. Sources of domestic GAAP (tax law or capital market reporting),

- d. Degree of openness of the capital market sector of the economy as measured say by the size of foreign direct investment,
 - e. The level of noninstitutional stock ownership,
 - f. The relative ability of nonequity sources of capital to monitor managers,
 - g. Transparency indices for capital markets,
 - h. Indices of political and bureaucratic corruption,
 - i. Indices of legal system credibility,
 - j. The permissibility of joint audits,
 - k. Restrictions on advertising and solicitation,
 - l. Market shares of Big 6 firms in preceding years in the sample.⁶
5. FTS conclude (p. 15) “We find that disclosure characteristics are an important determinant of the choice of large-firm auditor.” However, they also note (p. 13) “The coefficient on disclosure was not significantly different from zero with the inclusion of the country indicator variables. This result indicates that the country disclosure score cannot be readily separated from the country differences per se in explaining choice of large-firm-auditor.” Similarly, on p. 14, FTS note that litigiousness and regulatory burdens provide no explanatory power in explaining the hiring of reputable auditors. An alternative interpretation of the FTS results is that while the probability of hiring a reputable auditor varies from country to country, none of the macroeconomic factors FTS introduce do in fact matter. The authors do not suggest reasons why their preferred interpretation (i.e., disclosure levels matter in the choice of auditor type) is the right one.

3. Summary and conclusions

Viewing audit markets through the lens of modern IO suggests significant gaps in our current understanding of global audit markets. The challenge in this area, as with IO in the 1970s, is the need to move beyond simple cross-sectional regressions and tackle head-on the daunting complexity of audit-market institutions and rules. Hand in hand, better theory as well as more sophisticated empirical tools capable of reliably distinguishing between competing explanations both have valuable contributions to make.⁷ In short, the field of international audit-markets research is ripe for a wave of innovative and careful studies that combine good theoretical reasoning with careful data analysis to overcome the serious confounds facing research in this area. While FTS have made an interesting attempt to untangle determinants of the demand for auditor reputation, their methods give rise to some

⁶ Strictly speaking, to identify the impact of reputation, an even better design would be to run the analysis on auditor changes only or on auditor choices during IPOs (cf. Willenborg, 1999). Since this approach might lead to severe sample attrition, including the base rate of Big 6 shares in the economy in past years may help control for the unobservable factors at work in that country.

⁷ I use “theory” here in the sense of closely reasoned arguments linking antecedents to consequents.

significant concerns. Future research in international audit markets must address these concerns to progress beyond the point where the FTS study leaves us.

Acknowledgments

I thank Ira Solomon, Larry DeBrock, Dave Ricchiute, Linda Myers, and Jackie Hammersley for discussion and comments.

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The International Journal of Accounting
36 (2001) 429–432

**The
International
Journal of
Accounting**

Discussion of the demand for auditor reputation across international markets for audit services

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1. Introduction

The study by Fargher, Taylor, and Simon (2001) examines both the supply of, and the demand for, large-firm auditors in 20 countries using a simultaneous-equations methodology. This approach is used to control the reciprocal relationship between a firm's choice of auditor and its audit fees. Consistent with previous research that used single-equation models, the results of this study indicate a positive association between disclosure requirements and the choice of a large audit firm. This research also found that increased litigation and regulation are associated with higher audit fees.

While the study makes a number of contributions to the extant literature, the current paper (and/or future extensions of this stream of research) could be strengthened by more fully developing the discussion of the background theory and by providing better documentation of the theoretical support for the model used in this research. Each of these points is more fully discussed in the following sections.

2. Contributions

On the demand side, the authors hypothesize that disclosure-requirement differences across countries lead to agency cost differences; these differences, in turn, create cross-sectional variation in the demand for audit quality. On the supply side, the authors posit that in addition to audit quality, country-specific differences in disclosure requirements, litigation characteristics, and governmental regulation drive audit fee differences. Although many of these relationships have been documented in previous research, and are intuitive, this study's contribution to our

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understanding of the supply and demand for audit quality is from its explicit consideration of the endogeneity, or interrelationship, of audit quality and audit fees in an international context.

3. Background theory

3.1. Agency theory

The link between the demand for audit services and large-firm audits is based on agency theory and the previously documented link between audit quality and auditor size. While the authors of the paper briefly discuss selected agency theory concepts in the introduction of their paper, they do not provide an overall discussion of agency theory. It would assist readers in making the connection between agency theory and the model used in this research if there was a brief discussion of agency theory *before* the assumed connections between the research and the theory are discussed. For example, it would be helpful to include a discussion noting that the separation of firm ownership from the management of an organization frequently leads to asymmetric information, which, unchecked, may lead to suboptimal behavior on the part of managers. Therefore, asymmetric information creates the need for monitoring mechanisms of both management and the financial reporting process. As such, the most common external monitoring mechanism at the company level is the firm's external auditors (DeAngelo, 1981).

At the market level, governmental regulation serves as a monitoring mechanism, which, in turn, results in higher levels of regulation being associated with relatively higher audit fees. In sum, the authors could more readily make the connection between agency costs and firms' country-specific levels of disclosure with a more fully developed discussion of agency theory.

3.2. Reputation capital theory

The link between audit fees and audit quality is based on reputation capital theory. This concept should also be briefly explained, perhaps by simply stating that the theory holds that if the information covered by the opinion of a more reputable (large-firm) auditor is considered to be more precise, then it follows that the more prestigious audit firms can command higher audit fees due to the market value of their audit opinion (e.g., Simunic & Stein, 1996; Tomczyk, 1996). Reputation capital was first discussed by DeAngelo (1981), who hypothesized that since the larger audit firms have more clients, they have potentially more to lose if their reputation is damaged by failing to report a breach in a client's records.

4. Methodology

4.1. Simultaneous equations

The study uses a simultaneous-equations approach to acknowledge the endogeneity between auditor choice and audit fees. To describe the endogeneity, the authors use Copley,

Doucet, and Gaver's (1994) conceptual audit market model in which the level of audit quality demanded is a function of audit fees and audit fees are a function of the level of audit quality supplied. The paper (and readers) would benefit from a more complete discussion of the advantages of using simultaneous equations for this research. While the authors note: (1) the endogeneity between the choice of auditors and the resulting audit fees, and (2) using ordinary least squares (regression) is inappropriate because two of the variables ($\ln[\text{Fee}]$ and Big 6) are correlated with the error terms (ε_1 and ε_2), they need to better explain why using simultaneous equations results in stronger methodology than using separate single equations.

4.2. Gross domestic product (GDP) variable

The authors use a per capita GDP variable in their auditor-reputation (demand) model. However, the authors should have considered using the natural log (\ln) of GDP in order to transform the GDP data to fit a normal curve, given the wide variation in GDP across countries. For example, Table 3 of Fargher et al.'s (2001) paper indicates that per capita GDP ranges from 0.03 for India and Spain to 3.68 for Japan. If the authors did consider using the natural log of GDP, but dismissed it for some reason, then the authors' reasoning should be discussed in the paper.

5. Results

In the auditor reputation model, the positive coefficient on the audit fee variable, although insignificant, is of at least moderate concern from the standpoint that it may suggest that the model is misspecified. Further, the results indicate that once the endogeneity of audit fees and audit quality has been controlled for, the demand for audit quality has no impact on audit fees. Unlike previous research, this finding suggests that large audit firms do not receive fee premiums. The authors provide no explanation or additional analyses to further our understanding of these anomalous findings, diminishing the contribution of the study.

The results also show that variation in disclosure requirements is important in explaining both auditor choice and audit fees. However, sensitivity tests indicate that cross-sectional variation in disclosure requirements cannot be differentiated from other nonspecified cross-country differences. Thus, the concern is that the disclosure variable is simply picking up the effect of a correlated, but omitted, variable.

6. Future research

The study clearly suggests that further research is needed. Our understanding of the supply of, and demand for, audit quality in the international market appears to be quite limited. The lack of a positive coefficient on the audit quality variable in the supply model may suggest that auditor size may not be an appropriate proxy for audit quality on an international level. Thus, as the authors suggest, there is a need for better proxies for audit

quality. The lack of a negative coefficient on the audit fee variable in the demand model may suggest that a more comprehensive theory of the demand for audit services is needed within an international context.

7. Summary

This paper uses international data from 20 countries to model the simultaneity of supply and demand for auditor reputation, using the choice of a large-firm auditor as a proxy for auditor reputation. The link between the demand for audit services and large-firm audits is based on agency theory and the link between audit quality and auditor size. The link between audit fees and audit quality is based on reputation capital theory. This study's contribution to the literature is that it extends the work of Copley et al. (1994) and Copley, Gaver, and Gaver (1995), by the explicit consideration of the endogeneity of audit quality and audit fees in an international context.

Acknowledgments

The author acknowledges the helpful comments received from Karen Otto and Frank Beck.

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Pergamon

The International Journal of Accounting
36 (2001) 433–434

**The
International
Journal of
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Response to discussants' comments The demand for auditor reputation across international markets for audit services

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The discussants have given a great deal of consideration to the paper and have made numerous points that need to be considered in relation to this paper and future research in this area. As many of the reviewers' comments focus on methodological issues, our response to the discussants will focus on these concerns.

Both discussants are concerned with the possible misspecification of the simultaneous equation models including the possibility (in our view the near certainty!) that potentially important variables may be missing from one or both equations. Clearly, more refinement (and/or expansion) of the country-specific environmental variables is worthwhile. Fortunately, both give some specific suggestions, several of which will be useful in future research. Among the most substantive suggestions are:

1. Lindberg's suggestions that transformation of the gross domestic product variable be considered due to the wide variation in the variable. In response, we used a log transformation of both the GDP and Disclosure measures to mitigate the potential impact of extreme values on the distribution of residuals. The results and inferences for the audit fee model are qualitatively similar. In the simultaneous equations, estimation of the demand for Big Six reputation, the significance of the coefficient on Disclosure becomes somewhat less significant with a P value of .08 when both log Disclosure and log GDP are used. It should be noted, however, that the Condition Index (for a linear specification) is 196, substantially exceeding the rule of thumb that a condition index greater than 30 indicates strong collinearity (Belsley, Kuh, & Welsch, 1980). We speculate that the Disclosure index captures aspects of disclosure in a very broad sense,

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and that disclosure cannot be readily separated from other country characteristics such as stage of development as reflected in GDP per capita.

2. Doogar's extensive list of "mediating factors" that could serve to sharpen the analysis of environmental factors. Recent research (e.g. Ball, Kothari, & Robin, 2000) has focused attention on differences in legal regimes and other environmental factors across countries. Future research might consider how these factors relate to each other and to the market for audit services. Considerable thought is required, however, as to how these variables are to be incorporated into models of audit services. For example, Freidman, Johnson, Kaufman, and Zoido-Lobaton (2000) model corruption as a function of economic institutions such as the strength or weakness of the legal system. It is not clear whether corruption is an input to a model of auditing services or a result of the extent of auditing. Clearly, additional research is needed to refine the country-specific variables of interest in the market for audit services.

The incorporation of these and other of the suggestions of Lindberg and Doogar will not, however, address a serious weakness in this and many other papers: the lack of a continuous measure of the important, but elusive, concept of "audit quality." As in most other papers, we discuss this but wind up using the simple large-firm/small-firm dichotomy. This has been used in the past, but we acknowledge that it is a crude measure of audit quality. Further progress demands a better variable, but no one has yet been able to develop a more appropriate substitute.

With respect to some of the econometric issues raised, the two-stage model estimated provides a relatively simple simultaneous system taking into account the endogeneity between audit fees and auditor reputation. More complex relations between error terms of the equations can of course be considered. Similarly, we model a cross-section for a single year to mitigate the potential impact of the very high correlations of the variables through time. Future research might consider longer time periods; however, such research must have measures available for all metrics in all years and must overcome the potential overstatement of test statistics when using data pooled over several years where the measures are highly correlated through time. Future research could employ more powerful tests of the determinants of either audit fees or audit reputation where the context allows a study of changes in some aspect of the international market for audit services.

Again, we thank the discussants for their insightful comments and suggestions, which will be useful in extending and expanding research in international markets for audit services.

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The International Journal of Accounting
36 (2001) 435–450

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Journal of
Accounting

Effectiveness of minimum tax legislation and its effect on corporate financial reporting A comparative analysis between the United States and India[☆]

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Abstract

This paper reports a comparative analysis of the experience of introducing minimum tax legislation in the US and India. Given the differences in the economic and market settings in the two countries, one would expect the impact of the regulation and the corporate response to its introduction to be different. Our empirical analysis, however, indicates that the response to the minimum tax legislation in India is very similar to that in the US. The evidence indicates that the minimum tax legislation is not the best means of achieving horizontal equity among taxpayers, given its significant administrative and compliance costs and the manipulative reporting response it generates from the corporate sector. © 2001 University of Illinois. All rights reserved.

Keywords: Minimum tax; India; United States; Comparative analysis; AMT; MAT

1. Introduction

Minimum alternative tax (MAT) has been a hotly debated issue in India since its introduction in the budget of 1996/1997. While opinions differ as to whether such legislation

[☆] This paper was presented at the Illinois International Accounting Summer Conference held in Champaign, IL on June 1–2, 2001.

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was needed and whether it has succeeded, the corporate sector has viewed MAT as a retrograde step and has reportedly attempted to minimize the MAT burden by changing accounting policies. This paper draws upon evidence gathered on similar legislation in the US to help assess the impact of MAT and corporate response to its introduction.

Comparative analyses of similar policy initiatives in different market settings help the international professional and academic communities to better understand whether and to what extent similar legislation would succeed in other settings. Bailey (1999) has identified cross-country comparative taxation as one area deserving more attention even though relevant theory is limited and extensive data are difficult to obtain. The well-documented US experience with minimum tax legislation and the Indian evidence presented in this paper are instructive to other countries considering similar legislation.

It is often claimed that the policy measures in emerging countries are based on scanty evidence because electronic databases are unavailable. In India, anecdotal evidence indicating that profitable corporations paid little or no taxes, or that MAT has not resulted in significant revenue enhancements, has frequently appeared in the popular business press. However, empirical assessment of such evidence is largely unavailable. Using a comprehensive database on more than 6000 companies, we provide results of such an assessment.

In addition, we examine whether tax policies influence management's choice of financial reporting policies. While this issue has received considerable research attention in the US, empirical studies based on international experience, especially in the developing countries, are extremely sparse. Finally, as noted by Schipper (1989), specialized forms of earnings management in response to regulatory settings may potentially extend our understanding of earnings management. The evidence of earnings management presented in this paper contributes to such a body of literature.

The objective of the paper is to compare and contrast in the two market settings the (1) justification for introducing the minimum tax legislation by assessing tax avoidance by the corporate sector prior to such legislation, (2) the impact of minimum tax legislation in alleviating the problem of tax avoidance by profitable companies, and (3) the corporate response to minimum tax legislation through changes in financial reporting.

The remainder of the paper is organized as follows. Section 2 outlines the evolution of minimum tax legislation in India and describes the current MAT provisions. Minimum tax legislation in the US and its similarity with the MAT provisions is described in Section 3. Section 4 provides a brief description of the Indian economy and the accounting standard setting process in India, especially for income taxes. The extant literature on minimum tax legislation in the US and the corporate response to it is summarized in Section 5. Section 6 presents the empirical findings and Section 7 discusses the results. We then note in Section 8 study limitations and indicate avenues for further research. Section 9 provides summary and conclusions.

2. Minimum tax legislation in India

Minimum tax legislation in India started with the introduction of Section 80VVA of the Income Tax Act. The section, effective from April 1, 1984 to March 31, 1988, stipulated that

the total deductions admissible under the various incentive sections be restricted to 70% of preincentive total income. The objective was to ensure that at least 30% of the preincentive total income would be subject to tax. The deductions retrenched (i.e., disallowed) in a given year could be carried forward and claimed in subsequent assessment years.

The clerical work involved in tracking retrenched deductions and carrying them forward for subsequent deductions was complex. Section 80VVA was therefore replaced by Section 115-J on April 1, 1988, which levied a tax on notional book profits. Book profits were defined as the net profit shown in the profit and loss account prepared in accordance with Schedule VI of the Companies Act and were increased or reduced by various items specified by the new section. The appropriateness and the extent of these adjustments were controversial issues that the government chose not to resolve. Section 115-J was operative for 3 assessment years: 1988–1989, 1989–1990, and 1990–1991. The Central Board of Direct Taxes abolished Section 115-J via circular 572 on August 3, 1990, citing rationalization of tax structure as the reason.

Despite government's minimum tax initiatives described above, the ratio of corporate tax payments/profits before tax (PBT) had been steadily declining (Rao, 1996). In reaction to companies that reported significant book profits but paid little or no taxes, MAT was introduced in the 1996–1997 budget. It applied to corporate entities for financial years ending on or after December 31, 1997. MAT differed significantly from the Section 115-J provisions because no adjustments to the book income were now required.

The MAT rule stipulated that when corporate taxable income is less than 30% of book income, 30% of book income was deemed taxable. The provision can be expressed as follows: Deemed taxable income = max [Reported taxable income, 30% of Book income].

As an illustration, assume that corporation *X* has book income of US\$100 and taxable income of US\$40. It would not be affected by the MAT provision since its taxable income exceeds 30% of book income. In comparison, if corporation *Y*'s book income is US\$100 and taxable income is US\$20, the MAT rule stipulates that the 30% of book income (US\$30) is deemed taxable. Thus, the incremental amount subject to tax would be US\$10.

At the prevailing 43% statutory tax rate, the MAT provision made the effective corporate tax rate (ratio of income taxes paid/pretax book income) 12.9% ($43\% \times 30\%$). The effective tax rate for some corporations could be lower because of operating loss carry forwards and because the profits arising from exports and operations in the infrastructure sector (such as generation and distribution of power) were exempt from the MAT provision. The 1997–1998 budget stipulated that companies could treat MAT payments as tax credits to be carried forward for 5 years.

3. Minimum tax legislation in the US

Very few countries worldwide have resorted to an alternative minimum tax (AMT). Price Waterhouse (1996) examined tax systems in 115 countries and found that, worldwide, only five other countries (Colombia, Mexico, Pakistan, the US, and Venezuela) imposed some form of AMT. However, the minimum tax in all these countries, except the US, was only

recently introduced and is expressed as a percentage of assets or sales. In comparison, the AMT in the US, spanning three decades, had a feature similar to MAT, the book income adjustment (BIA).

Minimum tax legislation in India had the same objective as the AMT in the US to limit profitable entities' tax preference use and to ensure horizontal equity among taxpayers. The AMT is calculated by applying a tax rate to a tax base called AMT income (AMTI) determined by modifying regular taxable income through adjustments (outlined in Sections 56 and 58 of the Internal Revenue Code) and preferences (outlined in Code Section 57).

The MAT provision resembles the US BIA. The BIA applied to corporate entities for taxable years 1987, 1988, and 1989. In an attempt to ensure that profitable corporations paid at least some federal tax, the BIA required a corporation's AMTI to be increased by 50% of the excess of corporate book income (as shown in financial reports filed with SEC or other regulators) over AMTI.

For taxable years after 1989, the BIA no longer applies. Instead, corporate entities are required to use the adjusted current earnings (ACE) to ensure that the mismatching of book income and taxable income will not produce inequitable results (Hoffman, Raabe, Smith, & Maloney, 2000). For the ACE adjustment, AMTI is adjusted (up or down) for different items such as exclusions and disallowed items. An amount equal to 75% of the difference between the accumulated adjusted earnings and the unadjusted AMTI is then added to (or subtracted from) the unadjusted AMTI to get adjusted AMTI. The MAT provision appears to closely resemble not only the BIA that existed during 1987–1989 but also the ACE adjustment currently used. This similarity of MAT with the minimum tax legislation in the US provides a rationale for a comparative examination of the two.

4. Indian economy and accounting standards

India is the world's largest democracy and 14th largest country measured by Gross Domestic Product (US\$382 billion in 1997). The economic reforms undertaken since 1991 have unleashed the tremendous growth potential of the economy. There has been a rapid yet guided move towards deregulation and liberalization that has resulted in India becoming a major destination for foreign investment. The 6.9% growth rate in real GDP in the 90s is appreciably higher than the 5.5% that occurred during the 80s. Agriculture's contribution to GDP is declining, while contributions of the manufacturing and the services sectors have been increasing.

Accounting standards in India are promulgated by the Accounting Standards Board, a 21-member body sponsored by the Institute of Chartered Accountants of India (ICAI). Although the standards do not have the authority of law, they are followed by entities that want their financial statements audited.²

² This is similar to the US situation where nonpublic companies comply with the accounting standard in order to get their financial statements audited by CPAs.

India does not have a mandatory accounting standard for income taxes. However, ICAI (1991) issued a guidance note on income taxes suggesting the use of the liability method very similar to SFAS 109 in the US.³ The note stated that “It will take some time to develop the necessary awareness and expertise for the application of this method among the preparers of financial statements. Therefore, until the time such awareness and expertise are developed, it will be permissible for an enterprise to follow the tax payable as an alternative.” The tax payable method ignores interperiod allocations and records income tax expense equal to the tax payable to the revenue authorities. Nearly all companies in India use the tax payable method.

5. Extant literature

The accounting and tax literature in the US has examined the minimum tax legislation for its success in increasing horizontal equity among taxpayers, its cost effectiveness, and its effect on financial reporting by corporations.

The impact of minimum tax legislation has been a subject of continuing debate in the US (Anderson, 1988; Dworin, 1987; Jones, 1994; McIntyre, Kelly, Fisher, Wilhelm, & Dorrier, 1989; McIntyre & Wilhelm, 1985; Omer & Zeibart, 1993; United States General Accounting Office, 1995). McIntyre et al. (1989), in their survey of 250 profitable companies, reported that the free ride was over for a vast majority of the companies, thanks to AMT. Using the Monte Carlo simulation model, Dworin (1987) demonstrated that firms with higher book incomes will be unable to avoid taxes with the introduction of AMT. A 1995 GAO report stated that “. . . in every year from 1987 through 1992, at least 6000 corporations with positive book income that paid no regular tax paid some AMT and at least 9000 corporations with positive book income subject to regular tax paid an additional AMT amount.”

The increase in the horizontal equity among taxpayers is not unequivocal, however. The 1995 GAO report noted that AMT did not reach all corporations with positive book income. Omer and Zeibart (1993) noted that while taxes paid increased after AMT implementation, the incidence of new law did not necessarily fall on those firms expected to pay the new tax.

The costs of administering AMT and the compliance costs incurred by the taxpayers are also significant. The AMT was cited by all the corporations interviewed as among the provisions in the Internal Revenue Code with the largest record keeping and compliance cost burden (United States General Accounting Office, 1994). A survey by Slemrod and Blumenthal (1996) noted that firms subject to the AMT spent 18% more on compliance costs than others. US corporations also claim that the reduced profits caused by AMT resulted in a higher cost of capital and that the AMT adversely affects their global competitiveness. A *Wall Street Journal* report (December 14, 1992) stated that the corporate AMT taxpayers encounter capital costs that are 15–20% higher than the capital costs of companies that are not subject to the AMT. AMT also results in a disincentive to invest (Norton, 1993) and might

³ Guidance notes, recommendatory in nature, provide guidance to members on matters, which may arise in the course of their professional work and on which they may desire assistance in resolving difficult issues.

also prompt decisions that might hurt the corporate sector and national economy in the long run. For instance, the AMT considerations might prompt leasing equipment rather than buying it, even when leasing may not be the most cost-effective decision in the long run.

The impact of tax regulations on corporate financial reporting practices also received considerable research attention in the US. The empirical evidence indicates mixed results. While some studies (Guenther, 1994; Guenther, Maydew, & Nutter, 1997; Maydew, 1997) suggested that managers tend to reduce book income to save taxes, some other studies (Beatty, Chamberlain, & Magliolo, 1995; Hunt, Moyer, & Shevlin, 1996; Scholes, Wilson, & Wolfson, 1990) concluded that managers forego tax savings to avoid reducing book income.

AMT has affected corporate financial reporting practices by inducing US companies to engage in earnings management. To minimize the effect of BIA, companies needed to either increase the taxable income or report a lower book income or a combination of both. Since increasing the taxable income involved real cash outflows, many companies reduced the book income through accounting choices or changes. Several critics, including members of the Financial Accounting Standards Board, the American Institute of Certified Public Accountants, and the Securities and Exchange Commission, expressed concern that the BIA prompted earnings management by companies, which in turn hurt the reliability of their financial statements.

The literature also supports the proposition that firms subject to the AMT adopted more income-decreasing strategies than firms that are not subject to AMT. Gramlich (1991) found that firms most likely to be affected by AMT made income-decreasing accruals relative to a control group. Similarly, Boynton, Dobbins, and Pleasko (1992) concluded that firms that were unable to reduce their AMT exposure using net operating losses managed their earnings by taking unusual income-decreasing discretionary accruals. Dhaliwal and Wang (1992) offered additional evidence that firms that were likely to be affected by AMT manipulated timing and permanent differences in response to the BIA provision. Focusing on depreciation, amortization, and depletion, Manzon (1992) concluded that earnings were managed in response to the BIA component of the AMT. More recently, Northcut and Vines (1998) provided evidence indicating a positive association between political scrutiny and higher income-decreasing discretionary accruals for “corporate freeloaders.”

6. Analysis

6.1. Rationale for the introduction of MAT

To examine the potential tax avoidance by profitable companies prior to MAT's introduction in 1997, we obtained data on PBT and tax expense⁴ for all the corporations

⁴ Without required reporting of deferred taxes, the income tax expense in the financial statements is the same as income tax payable in India.

Table 1
Incidence of tax avoidance prior to MAT introduction

Item	1995	1996
No. of firms with PBT > 0	4466	4338
No. of firms with tax rate < 12.9% of PBT	3036	2963
Percentage of low-tax firms (tax rate < 12.9%; %)	67.98	68.30
Total PBT of profitable firms	Rupees 504 billion	Rupees 613 billion
Total PBT of low-tax firms	Rupees 288 billion	Rupees 309 billion
Percentage of profit subject to low tax rates (%)	57.14	50.41
Aggregate tax paid by low-tax firms	Rupees 4.86 billion	Rupees 6.84 billion
Effective aggregate tax rate for low-tax firms (%)	1.69	2.21

listed on the stock exchanges in 1995 and 1996 from the Center for Monitoring Indian Economy (CMIE) database.

Since the MAT provision targets profitable companies with low tax rates, we first removed all the corporations with zero or negative profits from the CMIE corporate database. This reduced the sample to 4466 companies in 1995 and 4338 companies in 1996. For this sample of profitable firms, we computed the proportion of firms that paid taxes at a rate lower than the 12.9% that is mandated by MAT. The results presented in Table 1 indicate that both in 1995 and 1996 more than two-thirds of the corporations paid taxes at a rate lower than 12.9%.

These large proportions of low tax rate firms would not be a concern to policy makers if such firms together represented a small percentage of the total corporate profits. We calculated the proportion of total profits of the firms in the low tax category. In each of the 2 years, over half of the aggregate corporate profits were accounted for by the low tax corporations (Table 1). The effective tax rates for these corporations averaged 1.68% and 2.21% in 1995 and 1996, respectively, well below the rate of 12.9% mandated by MAT. These results strongly support the government's rationale for MAT introduction.

6.2. Impact of MAT

To investigate whether tax avoidance continued in 1997 (the year after the introduction of MAT), we recomputed all the items in Table 1 for 1997. Of the 3262 profitable firms in 1997,⁵ only 1479 paid taxes at a rate less than 12.9%. Thus, compared to over two-thirds in the preceding 2 years, only about 45% of the profitable firms paid taxes in 1997 at a rate lower than that mandated by MAT. The aggregate PBT of these firms in 1997 was Rupees 179 billion, out of the total PBT for all the profitable firms of Rupees 621 billion. Thus, the proportion of profits subject to low tax rates declined to about 29% from over 50% in each of the preceding 2 years. The total tax paid by the low tax-paying firms in 1997, at Rupees 8.7 billion, resulted in an effective tax rate of about 4.8%. This rate was more than twice the rate

⁵ The reduction in the number of profitable firms from 4338 in 1996 to 3262 in 1997 is reflective of the changes in economic conditions in the country and their effect on corporate profitability.

in each of the preceding 2 years. Overall, therefore, there appears to be a substantial reduction in tax avoidance.

We also compared the tax rate distributions for profitable firms for 1996 (the year before MAT introduction) and 1997 (the year after). The distribution of the number of firms in different tax categories is presented in Table 2. A chi-square test was used to test for differences in the distributions. The results indicate that the proportion of firms paying taxes at a higher rate in 1997 (compared to 1996) was statistically significant at .01 level.

As stated earlier, differences in the proportion of companies in different tax brackets may not necessarily imply differences in terms of proportion of profits taxed at different rates. Therefore, the tax rate distribution for 1996 and 1997 based on profit proportion was computed. These results are presented in Table 3. The plot of these distributions (Fig. 1) demonstrates a complete stochastic dominance of the 1996 distribution over the 1997 distribution. The proportion of firms paying taxes at a rate lower than the rate implied in MAT (12.9%) was far lower in 1997 compared to 1996 for the entire tax rate range.

The analyses presented so far are based on different sample sizes each year. Whether the average effective tax rate changed because of changes in the sample or as a result of MAT is not answered. We, therefore, identified profitable companies that paid lower (than 12.9%) taxes in the year before (1996) and the year after (1997) the MAT introduction. This eliminated from the sample all companies that (1) were profitable in 1 year but not in the

Table 2
Distribution of companies in tax brackets for 1996 and 1997

Tax rate less than or equal to (%)	1996			1997		
	No. of companies	Cum freq	Proportion	No. of companies	Cum freq	Proportion
0.0	2320	2320	0.535	833	833	0.255
1.0	106	2426	0.559	27	860	0.264
2.0	76	2502	0.577	35	895	0.274
3.0	71	2573	0.593	18	913	0.280
4.0	60	2633	0.607	34	947	0.290
5.0	38	2671	0.616	23	970	0.297
6.0	66	2737	0.631	34	1004	0.308
7.0	45	2782	0.641	28	1032	0.316
8.0	38	2820	0.650	27	1059	0.325
9.0	40	2860	0.659	27	1086	0.333
10.0	48	2908	0.670	57	1143	0.350
11.0	26	2934	0.676	38	1181	0.362
12.0	30	2964	0.683	103	1284	0.394
12.9	30	2994	0.690	195	1479	0.453
15.0	74	3068	0.707	496	1975	0.605
20.0	184	3252	0.750	244	2219	0.680
25.0	158	3410	0.786	168	2387	0.732
30.0	131	3541	0.816	145	2532	0.776
>30.0	797	4338	1.000	730	3262	1.000

Table 3
Distribution of profits subject to different tax rates in 1996 and 1997

Tax rate less than or equal to (%)	1996			1997		
	No. of companies	Cumulative profits of companies (million Rupees)	Proportion	No. of companies	Cumulative profits of companies (million Rupees)	Proportion
0.0	2320	207,900	0.338	833	62,940	0.101
1.0	106	221,580	0.361	27	66,270	0.107
2.0	76	229,330	0.373	35	70,810	0.114
3.0	71	234,390	0.381	18	93,330	0.150
4.0	60	238,980	0.389	34	113,290	0.182
5.0	38	250,000	0.407	23	116,890	0.188
6.0	66	257,640	0.419	34	119,510	0.192
7.0	45	261,320	0.425	28	121,050	0.195
8.0	38	262,720	0.427	27	122,810	0.198
9.0	40	266,080	0.433	27	124,580	0.201
10.0	48	277,180	0.451	57	127,300	0.205
11.0	26	281,920	0.459	38	131,010	0.211
12.0	30	305,340	0.497	103	142,300	0.229
12.9	30	309,870	0.504	195	171,170	0.276
15.0	74	314,110	0.511	496	240,460	0.387
20.0	184	347,600	0.566	244	296,760	0.478
25.0	158	382,330	0.622	168	357,100	0.575
30.0	131	447,840	0.729	145	400,670	0.645
>30	797	614,620	1.000	730	621,270	1.000

other and (2) were in the low tax rate category (under 12.9%) in 1 year but not the other. The remaining 1769 companies paid Rupees 6.19 billion in taxes on a total PBT of Rupees 247.13 billion in 1996, for an effective tax rate of 2.51%. The same 1769 companies paid Rupees 42.67 billion in taxes on PBT of Rupees 259.45 billion in 1997, for an effective tax rate of 16.37%. Stated differently, while the PBT in 1997 increased by a mere 4.98% over 1996, the income taxes increased by 589%. This provides stronger evidence that the firms with low tax rates before MAT introduction were, in aggregate, subjected to higher tax rates after MAT introduction.

The US literature indicates that larger companies tend to be the bigger tax avoiders (McIntyre & Wilhelm, 1985). To examine if tax rates for large corporations in India changed with MAT, we compared effective tax rates for the largest (ranked by sales revenues) 100 companies in our sample for 1996 and 1997. In both years, the effective tax rate was zero for 29 firms. For the remaining 71 companies, the effective tax rate went up for 52 companies and down for 19. It is interesting to note that the effective tax rate for the 100 large companies increased from 2.49% in 1996 to only 5.66% in 1997. This increase is far lower than the increase (from 2.51% to 16.37%) in the tax rate for the overall sample of 1769 companies noted earlier. Thus, compared to the small companies, it appears that the larger corporations benefited more from the legislative provisions that excluded certain incomes (e.g., exports and infrastructure activities) from being subject to MAT. Their large size apparently allowed

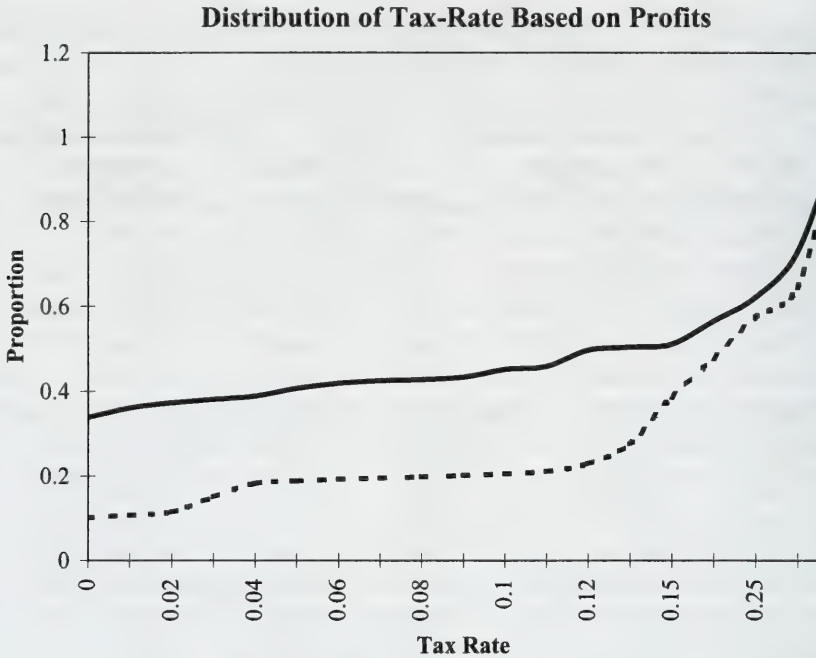


Fig. 1. Distribution of tax rate.

them the financial flexibility to diversify into the parts of their business profits (such as infrastructure) that were exempted from MAT.

6.3. Earnings management

To reduce the BIA and the AMT burden, US firms had an incentive to manipulate their financial reporting numbers (*Tax Notes*, November 17, 1986; Manzon, 1992). Similarly, MAT provisions in India provided an incentive for the firms to report lower book income. *Economic Times* (May 13, 1997) reported that the MAT liability had prompted corporations to post lower profits by changing accounting policy to avoid taxes.

The popular business press in India frequently noted that companies changed their depreciation policy to escape MAT. *Economic Times* (May 13, 1998) stated that “a popular option followed is changing over from the straight line method to the written-down value (i.e., declining balance) method to account for depreciation.” In reviewing the corporate performance in the first half of 1997, Shirsat and Korgaonkar (1997) note “In a bid to escape the MAT, most companies have made higher provision for depreciation.” This suggests that companies changed their depreciation policies to reduce book income for external reporting (but not for taxes), reducing the gap between the book and tax income to a level where MAT provisions were not invoked.

To examine if companies likely to be affected by MAT managed their earnings, we compared the proportion of companies reporting higher depreciation (as a percentage of gross

fixed assets) in the year after MAT introduction to the year before, when incentives to report higher depreciation did not exist.

Investigation of the corporate reporting response to MAT requires identification of firms that have an incentive to manage reported figures. Limitations of many US studies (for example, Dhaliwal & Wang, 1992; Gramlich, 1991) include incorrect identification of firms affected by AMT and the assumption that all firms subject to the AMT had an equal incentive to reduce book income. Identifying firms that were affected by the MAT provision is even more difficult in the Indian context because the reporting requirements are less stringent than in the US. We therefore adopted an approach that ensures that while some MAT-affected firms might be excluded from the sample, those included in the sample were indeed affected by MAT.

The MAT-affected firms were defined as the profitable firms that paid low taxes (below 12.9% of PBT) in 1997 and in either 1995 or 1996. The number of companies that met this criterion was 1301. However, incentives for income manipulation would be lower for firms with carry-forward operating losses or for firms in the infrastructure and export sectors since their profits are exempt from MAT. Therefore, we eliminated the 833 firms that paid no taxes from the sample of MAT-affected firms. This reduced the sample size from 1301 to 468.

To compare the reporting behavior of MAT-affected and non-MAT-affected firms, we needed a control group that was unlikely to manipulate income because of MAT. Such a group would have an effective tax rate much higher than 12.9%. We used 20% as the cut-off tax rate for identifying firms less likely to manipulate earnings, resulting in 220 firms in the control group.

The corporate response to MAT in terms of depreciation rates charged in the year before MAT imposition (1996) and the year after MAT imposition (1997) is presented in Table 4.

Table 4
Corporate reporting response to MAT

	MAT companies		Non-MAT companies		Total	
	1997	1996	1997	1996	1997	1996
<i>Panel A: Overall analysis</i>						
Number of companies	468	468	220	220	688	688
Number of companies reporting higher rate of depreciation	285	182	131	123	416	305
Proportion (%)	60.9	38.9	59.5	55.9	60.5	44.3
<i>Panel B: Companies with higher profits than preceding year</i>						
Number of companies	151	266	108	133	259	399
Number of companies reporting higher rate of depreciation	76	105	62	68	138	173
Proportion (%)	50.3	39.5	57.4	51.1	53.3	43.4
<i>Panel C: Companies with lower profits than preceding year</i>						
Number of companies	317	202	112	87	429	289
Number of companies reporting higher rate of depreciation	209	77	69	55	278	132
Proportion (%)	65.9	38.1	61.6	63.2	64.8	45.7

Panel A of Table 4 indicates that the difference in the proportion of firms increasing their depreciation rate changed from 55.9% in 1996 to 59.5% in 1997 for the non-MAT-affected firms. This change is not statistically significant. However, for the MAT-affected sample, the proportion of firms increasing their depreciation rate changed from 38.9% in 1996 to 60.9% in 1997. This difference is significant at .01 level, suggesting that the reporting response to MAT was very different for the two groups. The MAT-affected firms reduced reported income to save tax outflows by increasing their depreciation charges.

One interesting issue is whether the reporting response was different depending on whether a firm experienced an increase or a decrease in profits. Firms with a decrease in profits may not be as likely to increase the depreciation charge as would be the firms with an increase in profits. The samples of MAT and non-MAT companies were therefore split into two categories: companies whose profits (before depreciation) increased over the previous year and companies whose profits (before depreciation) decreased over the previous year. Of the 468 MAT companies, 266 reported profit increases in 1996 over the previous year and 202 reported profit decreases. For 1997, the numbers were 151 and 317, respectively, for profit-increasing and profit-decreasing MAT companies. Similar distribution of 220 non-MAT companies into profit-increasing and profit-decreasing categories was 133 and 87, respectively, in 1996 and 108 and 112, respectively, in 1997. For both MAT and non-MAT companies, we examined the proportion of companies reporting higher rates of depreciation in each of the 2 years for the profit-increasing and profit-decreasing categories. The results are presented in Panels B and C of Table 4 for profit-increasing and profit-decreasing firms, respectively.

For the non-MAT firms that experienced increased profits in 1997, the proportion of firms reporting higher rate of depreciation changed from 51.1% to 57.4%. This result is significant only at 17%. A similar proportion for the MAT-affected firms, however, changed from 39.5% to 50.3%, which is statistically significant at .02. For the MAT-affected firms experiencing lower profits (Panel C), the proportion of firms reporting higher depreciation went up from 38.5% in 1996 to 65.9%, which, too, is significant at .01. Such firms were able to benefit from lower tax consequences than they would have been without the increased depreciation. In comparison, the proportion of non-MAT firms that reported higher depreciation in the presence of lower profits went down marginally from 63.2% in 1996 to 61.6% in 1997. This result (significant only at the 59% level) confirms that non-MAT firms with increased book income did not increase depreciation rates possibly because there were no tax advantages resulting from such an action.

7. Discussion of the results

A significant reduction in the proportion of non- and low tax-paying companies and in the proportion of profits of such companies to the total corporate profits after MAT introduction indicates that the legislation has produced the impact intended by the government. The percentage of Indian companies not paying taxes prior to the introduction of MAT was 53.5. This percentage declined to 25.5 after MAT was introduced, suggesting that MAT was a successful policy initiative.

However, the success of the minimum tax legislation has not been unequivocal. In terms of tax revenue generated, the results have been mixed in both the US and India. While the expected AMT revenue in the US for the first 3 years was US\$14 billion, actual revenues were only US\$7.8 billion. In India, although the revenue secretary estimated MAT collections at Rupees 16–18 billion, the actual collections reported by the union finance minister were only Rupees 9.1 billion (*Economic Times*, July 26, 1996). Moreover, since MAT is applicable only to the corporate entities, these revenue collections amount to only 0.07% of the total revenues of the government. This could partially be attributed to the fact that many corporations were still able to escape MAT by reporting income from activities such as exports and infrastructure that are exempt from MAT provisions.

The less than expected revenue collection so far is disconcerting and the limited prospects for tax generation in the future are clearly disappointing for the government. Since the MAT payments can be treated as a tax credit that can be carried forward for 5 years, a significant portion of the MAT collection might be revenue acceleration (which will allow government the benefit of the time value of money) rather than enhancement. If most companies use the tax credits, the only benefit to the government is the time value of money. The MAT payments would be revenue enhancements only for companies that are currently profitable but are likely to incur losses over the next few years, thereby being unable to benefit from tax credit. This unintended consequence of the MAT provision exacerbates the tax burden on firms that are least able to bear it.

The costs of administering the minimum tax legislation and the compliance costs incurred by the taxpayers are also significant. Since no research on this issue is available in the Indian context, the US experience is instructive for policy makers in India and other countries considering the introduction of minimum tax legislation. The policy makers must decide whether the benefit of time value of money resulting from the accelerated revenues is worth the cost of minimum tax legislation borne by taxpayers and the government.

In the US context, Northcut and Vines (1998) conclude that political scrutiny of effective tax rates provides incentives that influence accounting policy choices and that management considers the impact of taxes on financial reporting. In India, too, the corporate response to the MAT introduction has been to manage earnings to minimize the tax burden. Regardless of the effect on the reported profits, Indian managers appear to maximize shareholder value by minimizing tax outflows.

However, the reduced profitability of Indian companies can adversely affect their attractiveness to the global capital markets. At a time when many Indian companies are trying to tap international debt and equity markets, the MAT legislation could be considered undesirable because it ostensibly resulted in many companies reducing their book profits.

8. Limitations and future research

The limitations of this study need to be noted in interpreting its conclusions. Our approach to identifying MAT-affected companies to investigate earnings management behavior does not guarantee the inclusion of exclusively minimum tax firms because the effective tax rate should

be no less than 12.9% if the MAT really works. Secondly, a careful review of the business press and our research design has attempted to control the confounding variables. However, it is possible that other changes in the economy in the year of MAT introduction, or additional concurrent changes in the 1996–1997 budget, have partially driven the results of the study.

We studied depreciation changes to examine the evidence of earnings management. An interesting extension would be to study what other earnings management tools have been used by companies to minimize the effects of MAT. Another interesting extension would be to examine the stock market reaction to earnings management. From the prebudget levels, the drop in the market capitalization was Rupees 589 billion (approximately 11%) within 1 month following the budget. While the causality between stock market decline and MAT introduction is difficult to establish, the business press seemed to suggest a link (Nagpal, 1999; Nair, 1999). It would therefore be interesting to examine whether the stock market response was significantly different for MAT-affected and non-MAT-affected companies.

9. Conclusions

In conclusion, MAT legislation appears to have increased horizontal equity among taxpayers in India. However, the prospects of such legislation for revenue enhancement appear limited, given its restricted scope and applicability only to the corporate entities (Gujarathi & Barua, 1998). The legislation also results in income manipulation by corporations, which adversely affects the reliability of financial statements. Such unreliability in developing countries with fledgling capital markets can create distortions in valuations and capital allocations. The MAT effectiveness is especially contentious if the administrative costs incurred by the government and compliance costs incurred by the taxpayers are taken into account. In India, because of the existing loopholes, companies are able to limit their tax liability by paying only a marginal amount under MAT (Padmakshan, 1999). As a result, one proposal under consideration for the MAT revision is to tax corporations on the basis of their total assets rather than their economic profits. While such a system promotes better utilization of existing capacity, the fairness and legality of taxing a corporation with significant assets but little or no income will be a contentious issue. Mexico's Supreme Court held its system of AMI based on asset size unconstitutional on the grounds that income tax can be levied only on income.

The US literature suggests that the only viable long-term solution for correcting the corporate abuses of tax code preferences is their elimination, rather than introducing minimum tax legislation. As aptly noted by King (1988), "Congress insists on giving tax incentives for favored activities then falls over itself trying to prevent big businesses from using these incentives." This thinking is also shared in India where some experts have said that "the best course would be to do away with the MAT provision in the next 4–5 years by eliminating tax preferences in the Act" (Pandey, 1996). However, the vested interests and lobbying efforts will test the political will to repeal such tax incentives and preferences. Policy makers in other developing countries contemplating minimum tax legislation would benefit greatly from examining the recent Indian experience and the extended US experience, both of which indicate that the results from such legislation are mixed, at best.

Acknowledgments

The authors would like to thank two anonymous reviewers, Professors Mohamed Hussein (University of Connecticut), Mark Nixon and Terrance Skelton (Bentley College), and Sundararajan (Indian Institute of Management, Bangalore) for their help on the earlier drafts of the paper. Research assistance from Marina Malinov and comments from the participants at the Bentley College Research Workshop and the Eleventh Asia-Pacific Conference on International Accounting Issues are also gratefully acknowledged.

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Pergamon

The International Journal of Accounting
36 (2001) 451–457

**The
International
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Minimum tax legislation and its effect on corporate financial reporting: A comparative analysis between US and India: a discussion

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Abstract

In this study, the authors investigate imposing a minimum alternative tax (MAT) on Indian corporations during the 1996–1997 budget years. The authors have two objectives: to assess the new legislation's impact on tax revenue, and to determine how corporations responded to its imposition because of its explicit link to financial reporting. They first assess whether, on average, firms with low estimated tax rates before the imposition paid higher taxes after imposition and find, overall, that corporations paid, in total, a greater amount of their income in taxes. They also find that the largest firms in their sample experienced a smaller increase in their effective tax rates than smaller firms did. Next, they assess whether MAT-affected firms altered their financial statement reporting to reduce exposure to the MAT. Specifically, they assess whether a greater portion of MAT-affected firms changed their financial statement depreciation policies than non-MAT-affected firms. They report that, for their sample, a significant number of MAT-affected firms increased their depreciation rate after MAT imposition. The proportion of non-MAT-affected firms changing depreciation rates after imposition was not significant. They also partition MAT- and non-MAT-affected firms on increasing or decreasing book profit and find that MAT-affected firms made proportionally more changes. The authors conclude that the MAT appeared to have increased horizontal equity among taxpayers in India, but its tax revenue enhancement potential is limited by its scope, limited applicability, and avoidance behavior by affected corporations. My comments are directed at what I perceive to be motivational and methodological issues in the paper and the conclusions we can draw from the current representation. © 2001 University of Illinois. All rights reserved.

Keywords: Tax; Earnings management; Tax rate; India

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1. Motivation issues

Research on the impact of, and reaction to, alternative minimum tax (AMT) policies in the US has been extensive. The authors provide an adequate review of AMT research in the United States and extend the literature by looking at a similar issue for a sample of Indian corporations. The authors state as one motivation for the extension: “Given the differences in the economic and market settings differences between the two countries, one would expect the impact of the regulation and the corporate response to its introduction to be different.” The authors support their line of inquiry using Bailey (1999) and the notion that this research line has instructional benefits to countries considering similar legislation.

This research issue is potentially interesting, but I believe that the authors’ justification for the extension needs additional support. Regardless of the country in which the analysis is conducted, imposing a new tax policy on profit-seeking corporations that increases their tax liability is likely to generate avoidance behavior. Consequently, the authors need to be specific about the Indian political, economic, and market settings that might foster a reaction different from the experience with the AMT in the United States. It is not sufficient to indicate that the Indian political, economic, market, or regulatory climate is less developed than that of the United States because such an argument applies to many other countries as well. Unless paying more taxes is culturally more acceptable in India than in the United States, the onus is on the authors to provide the basis for their expectation that the India reaction would be different. In particular, I would be interested in whether differences between US GAAP and Indian GAAP, or differences in public financial statement regulation between the United States and India, would contribute to different reactions to imposing minimum alternative tax (MAT). Their arguments could address why they believe that reactions by Indian corporations might be more or less than corporate reactions to the AMT in the United States. Currently, the authors’ result is consistent with outcomes obtained in the United States and a clear picture of how this study extends the current literature is missing.

2. Methodology issues

2.1. *Rationale for MAT*

The authors begin by providing evidence supporting India’s rationale for imposing an MAT. They calculate effective tax rates for profitable corporate samples from 1995 and 1996 and present results suggesting that profitable corporations, in substantial numbers, had effective tax rates less than the expected minimum MAT rate, and these same firms were responsible for a substantial percentage of total sample profits. The results are helpful for setting the stage to determine whether the corporate tax burden changed after MAT imposition and provides at least indirect evidence of India’s concerns about the tax burdens of profitable Indian corporations. The authors could strengthen their contribution by addressing the following three concerns.

First, the study by McIntyre and Wilhelm (1985) was controversial, in part, because its tax burden measure failed to consider deferred taxes and the industry composition in their sample.¹ The current study authors point out that, in India there is no formal or mandatory accounting standard for income taxes and suggest that nearly all firms use the “tax payable” method for reporting taxes on the financial statements. The authors should provide information about the extent to which they believe their sample firms reflect the population norm for tax reporting. Without knowing something about the percentage of corporations likely to be using the “tax liability” alternative to the tax payable method, it is difficult to determine the validity of any comparisons among the sample firms. While determining the tax reporting method at this stage of the analyses may be implausible, it is critical in later analyses where sample sizes are much smaller. Checking a random sample of their firms at this stage would reduce concerns that inferences drawn here and later in the paper are not the result of different financial reporting policies.

The second concern is that the authors use an effective tax rate measure to discriminate between MAT-affected firms and those that are not. Studies by Dworin (1987) and Omer and Ziebart (1993) suggest that the type of industry is an important determinant of the tax burden in the United States. Thus, comparing sample firms using only a ratio of taxes paid to book income ignores any explicit differences in industry taxation. Estimating tax burdens for sample firms, without industry controls, may inadvertently suggest widespread tax avoidance that is the result of explicit programs favoring targeted industries. It would be helpful here and in later analyses to also provide some evidence indicating whether the low tax rates presented in the paper are due to a general decline in tax payments by corporations or to industry differences in the sample. Firms in the same industry are more likely to share the same tax incentives and deductions and the extent to which profitable corporations with low tax rates are evenly distributed across industries is suggestive of a larger tax avoidance problem, at least, in this sample.

The final concern with the rationale results is the extent to which reported profits and low tax payments is problematic in this sample. Assuming that the correlation between taxes paid and profitability, although not necessarily high depending on industry and economic conditions, is positive, the authors provide only weak evidence that their low tax sample is representative of firms the Indian government considers problematic. They support their contention with results that indicate that overall profits earned by the low tax sample accounted for over half of the aggregate corporate profits in each of the two sample years. However, because the proportion of low tax firms in their sample is large in both years and assuming the correlation between reported profits and tax payments is positive, their low tax sample likely includes low tax, low profit firms. The extent to which low tax, low profit firms contribute to the aggregate profit measure weakens the argument that this is a representative sample.

¹ McIntyre and Wilhelm included a substantial number of regulated utilities in their sample, which are generally removed from most samples because in the rate setting process taxes are passed on directly to consumers.

One alternative is to segregate the low tax firms into two groups, for example, with profit above and below the median profit for the low-tax group or above and below the median profit for the total sample. The additional segregation by profit will provide better segregation of the low tax sample firms and stronger evidence that the sample is representative of problematic firms.

2.2. Impact of MAT

The authors perform three analyses to determine if the MAT altered the tax burden distribution of sample firms. In the first analysis, similar to that in the previous section, they compare sample firm effective tax rates, ignoring sample differences, and find that, in general, taxes increased from 1996 to 1997 after MAT imposition. The authors appropriately reduce their sample to firms with observations in both 1996 and 1997 and note that total taxes paid to total profits increased from 1996 to 1997. Thus, the authors have correctly reduced concerns that their initial results were related to changes in the sample. The authors also consider the largest firms in the reduced sample and note that effective tax rate increases for these firms were lower than for the total sample.

There are several concerns with these analyses. First, I believe that the paper is better served by considering the change in taxes paid by industry as compared to the total sample, as I reasoned earlier.

The second concern is the authors' statement about firms chosen for their "own-firm" control group analysis.² The authors' select firms with effective tax rates less than 12.9% in 1996 and find that indeed the total taxes paid to total profits increased after 1996. One problem with this approach is the absence of a comparative analysis for firms in the 1996 sample that had effective tax rates in excess of 12.9%. By ignoring these firms, we are unable to infer whether the MAT raised taxes in general, or whether it was effective in raising the tax liabilities of target firms. If taxes paid for the non-MAT firms increased in much the same way as MAT-affected firms, the conclusion that the MAT was effective in increasing the horizontal equity of taxpayers in India would be suspect.

Finally, the authors' size analysis is not well integrated in the research design. Including this analysis would be appropriate if the authors had previously discussed a political climate in India suggesting that large firms were subject to greater government scrutiny, (i.e., the political cost hypothesis; Zimmerman, 1983) and is a testable hypothesis in India as it is in other economies. As presented, the result is descriptive of the apparent outcome but a meaningful interpretation of the result or discussion of what this adds to the authors' overall objectives is missing.

² In addition, there appears to a misstatement regarding the sample selection procedure. The authors indicate that firms chosen had effective tax rates lower than 12.9% in both 1996 and 1997 for their own control group analysis. They then indicated that the tax rate for these firms increased to 16.37%. For purposes of this discussion, I am assuming the sample had low tax rates in 1996 only.

2.3. Earnings management

The authors' present results from two analyses as evidence of the earnings management reaction to MAT imposition. Their results indicate that a greater proportion of MAT-affected firms reported higher depreciation expense to gross asset ratios. They suggest this is evidence that MAT-affected firms increased their reported depreciation in order to lower book income. This is consistent with the anecdotal evidence provided regarding the expected corporate reaction to MAT. However, these analyses have numerous weaknesses that should be addressed.

First, the two limitations I discussed above, tax reporting choice and industry type, are particularly important to the validity of these results. With the smaller sample, the authors should provide some assurance that reporting for taxes is the same across firms in their sample and that firms identified as MAT-affected are not dominated by one or two industry groups that generally have lower taxes. The authors' sample selection criteria clearly points to the importance of industry membership because they eliminate, from this final sample, firms in the infrastructure and export sectors.

Second, the authors' acknowledge the difficulty in detecting non-MAT- and MAT-affected firms and I concur with their concerns but have two suggestions regarding these groups that may strengthen their results. The first suggestion is to provide some assurance that the cutoff between MAT- and non-MAT-affected firms (i.e., effective tax rates greater than 20%) did not influence their results. I suggest a sensitivity analysis to determine whether the results are robust to various cutoff levels. The additional analysis is especially important when one considers imprecision of the instrument for determining whether firms are affected. The second suggestion is to consider the nontaxpaying firms dropped from the sample as an additional control group. This set of firms also represent a sample unaffected by the MAT provision either because they are exempt from tax or have a net operating loss carry forward that eliminates their 1997 tax liability. Thus, the proportion of firms changing depreciation rates (methods) in this sample should mimic the authors' non-MAT-affected firms. This additional sample provides some assurance that the method for discriminating between MAT- and non-MAT-affected firms was reasonably successful.

Third, the authors selected change in depreciation expense to gross fixed assets as their earnings management measure but ignored a more explicit change measure. The explicit measure is the footnote disclosure indicating that firms' depreciation methods were changed. The authors cite reports indicating that firms changed their depreciation method to escape MAT. Thus, at least under United States GAAP,³ a footnote disclosing the reason for the change and an auditor report indicating the auditor's concurrence with the change should exist. The authors should indicate the extent to which Indian firms have the flexibility to change depreciation methods or estimates without concerns that auditors would not concur with the reason for the method or estimate change. In addition, the change measure used is subject to many factors that are unrelated to the MAT. For example, the asset life mix for

³ Discussions with colleagues suggest that India's GAAP would also require a footnote statement.

financial and tax purposes will alter the depreciation to fixed asset ratio. Thus, firms adding new fixed assets with shorter or longer asset lives will change this ratio reducing its reliability as a measure of earnings management. In light of this problem, checking the footnotes for depreciation method changes might be a better indicator of attempts to avoid the MAT.

Better identification of earnings management firms might be accomplished by estimating the reduction in reported book income resulting from the depreciation change. By providing this estimate, the authors can further segregate sample firms into groups that likely engaged in earnings management. For example, using the median effect on reported book income, the authors could segregate sample firms above and below the median with firms above the median being more likely to have engaged in earnings management. Although the authors' analysis suggests that firms with higher profits before depreciation also reported higher depreciation, there is no evidence that the higher depreciation perceptively reduced firms' exposure to MAT. The estimated effect on reported income may suggest whether the change sufficiently reduced MAT exposure. The estimated effect on reported income could also be used to make comparisons between MAT- and non-MAT-affected samples.

Fourth, the authors split their non-MAT- and MAT-affected sample firms into profit increasing and decreasing subsets to determine whether the incentive to change rates was greater when profits were increasing. Their results for the income increasing MAT-affected firms and income increasing non-MAT-affected firms are consistent with the notion that firms increased depreciation rates to avoid the new MAT.

However, the results for income decreasing MAT-affected firms indicate that proportionally more income decreasing MAT-affected firms changed depreciation rates than income increasing MAT-affected firms. There are many possible explanations for this result, including the authors', but no effort to eliminate any of the alternative explanations (e.g., poor discrimination of ETR measure, industry concentration) is conducted. Eliminating some or all of these alternative explanations would give greater support to arguments that the changes were MAT related.

Finally, the authors do not discuss the extent to which nontax factors might limit firms' incentives to reduce book income. This may be beyond the scope of the current study but is certainly an issue that should be discussed, especially in light of the evidence that US managers and markets are sensitive to downward revisions in reported financial numbers even when the change results in positive cash flows to the firm (e.g., LIFO Choice).

3. Conclusion

In conclusion, I would like to say that the authors have a potentially interesting study because it deals directly with the differences in reporting incentives between book and tax. That said, there are additional steps that the authors must take before concluding that the horizontal equity of the tax system in India was improved and that the MAT may be limited because of its scope and the earnings management of firms potentially affected by its imposition.

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Pergamon

The International Journal of Accounting
36 (2001) 459–483

The
International
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The association between European materiality estimates and client integrity, national culture, and litigation[☆]

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Abstract

The research examines the differences in materiality estimates for a sample of 181 experienced auditors from Big-Six firms located in Denmark, Ireland, Italy, Spain, Sweden, The Netherlands, and the UK. We asked each auditor to estimate materiality for a client whose integrity his/her firm rated as either high or low [Ir. Account. Rev. 1 (1994) 1.]. The research found that low client-integrity ratings resulted in lower materiality estimates for the European auditors. The research also indicates that as the cultural construct of Uncertainty Avoidance [Hofstede, G. (1980). *Culture's consequences*. Beverly Hills: Sage.] increased, materiality estimates also increased. Although one might have anticipated that materiality would decrease with the level of litigation, it, in fact, increased. We also compared the data from the western European countries with the estimates from a group of 83 auditors from the same Big-Six firms located in the United States.¹ © 2001 University of Illinois. All rights reserved.

Keywords: Materiality; Client integrity; Culture; Litigation

1. Introduction

The Accountants International Study Group (1974) compared the existent practices and examined materiality concerns in financial reporting. The report not only enumerated the arguments in favor of setting materiality guidelines (par. 28) but also the arguments against

[☆] This paper was presented at the Illinois International Accounting Summer Conference held in Champaign, IL on June 1–2, 2001.

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¹ Since the data were gathered, the Big-Six firms have become the Big-Five firms.

the prescription of guidelines on materiality (par. 29). The International Accounting Standards Committee (IASC) endeavored to create a set of standards that will lead to “the improvement and harmonization of regulations, accounting standards and procedures relating to the presentation of financial statements” (IASC, 1999a). Another possibility is mutual recognition. Unlike harmonization, mutual recognition does not require a country to change its rules. Rather, each country agrees to accept the accounting rules and regulations of other countries. However, before a country adopts a policy of mutual recognition, it should be confident that, even though specific audit procedures may vary, the level of audit precision is constant between the two countries. Consequently, culture (Hofstede, 1980, 1991) might influence an auditor’s decision-making process and thus influence materiality estimates.

To date, there is no empirical evidence to support the premise that implementing international standards provides comparable statements of equal precision. This research examines the effects of client-integrity ratings (Bernardi & Arnold, 1994; Estes & Reames, 1988), culture (Hofstede, 1980, 1991), and the level of litigation within a country (Wingate, 1997) on materiality estimates from an international perspective. The research also compares the European materiality estimates with the estimates from a group of US auditors (Bernardi & Arnold, 1994). The European sample includes 181 auditors (25 partners, 67 senior managers, and 89 managers) with Big-Six auditing firms from Denmark, Ireland, Italy, The Netherlands, Spain, Sweden, and the UK. The US sample includes 83 auditors (31 senior managers and 52 managers) from Big-Six firms (Bernardi & Arnold, 1994). The research questionnaire (Appendix A) was developed with the assistance of representatives of Big-Six firms located in the United States; representatives of the European firms participating in this research validated the questionnaire.

2. Theory development

2.1. Overview

In selecting the countries to investigate auditors’ determination of materiality, we carefully considered each country’s accounting system and culture. A system of rules and regulations such as an accounting system does not develop in a vacuum. Rather, the system is the result of the interactions and compromises between various environmental factors. These factors include the type of economy, the stage of economic development, the nature and development of capital markets, the management and ownership of corporations, the main providers of corporate capital, the regulatory framework, and cultural attitudes (Radebaugh, 1975). There are several key differentiating factors that led to the selection of the western European countries in the sample. Of specific interest were the providers of corporate capital, type of tax system, legal systems, and legal and regulatory structure.

Historically, European countries have been financed primarily using debt or equity. For instance, German firms primarily use debt financing and firms in the UK use equity financing. This suggests different disclosure requirements because of creditors’ and investors’ ability to bargain for specific accounting disclosures. Nobes and Parker (1988) suggest

that legal and regulatory systems are important to the extent that countries can be differentiated on the basis of their development from either common law (i.e., UK and Ireland) or codified Roman law (i.e., France, Italy, Spain, and The Netherlands). The final variable used in the selection process was national culture (Hofstede, 1980). Some may contest any one or all of these factors. For instance, Nobes (1998) argues with traditional lists of factors that influence international differences. Instead, he offers two explanatory variables that split the accounting systems into classes: culturally self-sufficient countries and culturally dominated countries.

The differences in financing sources cited above play a significant role in the preparation of financial statements. For instance, while continental Europe has relied on debt financing, the United States and UK have traditionally relied far more heavily on equity funding. On the continent, creditors typically are represented on the board of directors and thus have access to information not in the financial statements. Clearly, this is different from the United States and UK where agencies such as the Securities and Exchange Commission (SEC) mandate full and fair disclosure for stockholders. Additionally, regulatory and litigation (shown in Fig. 1) are greater in these countries.

Initially, firms from nine western European countries (underlined or italicized in Fig. 1) agreed to participate in the study. These countries were selected because their Uncertainty Avoidance scores (Hofstede, 1980) and Litigation indices (Wingate, 1997) provide a sufficient range of values for the study. Of the countries that agreed to participate, the

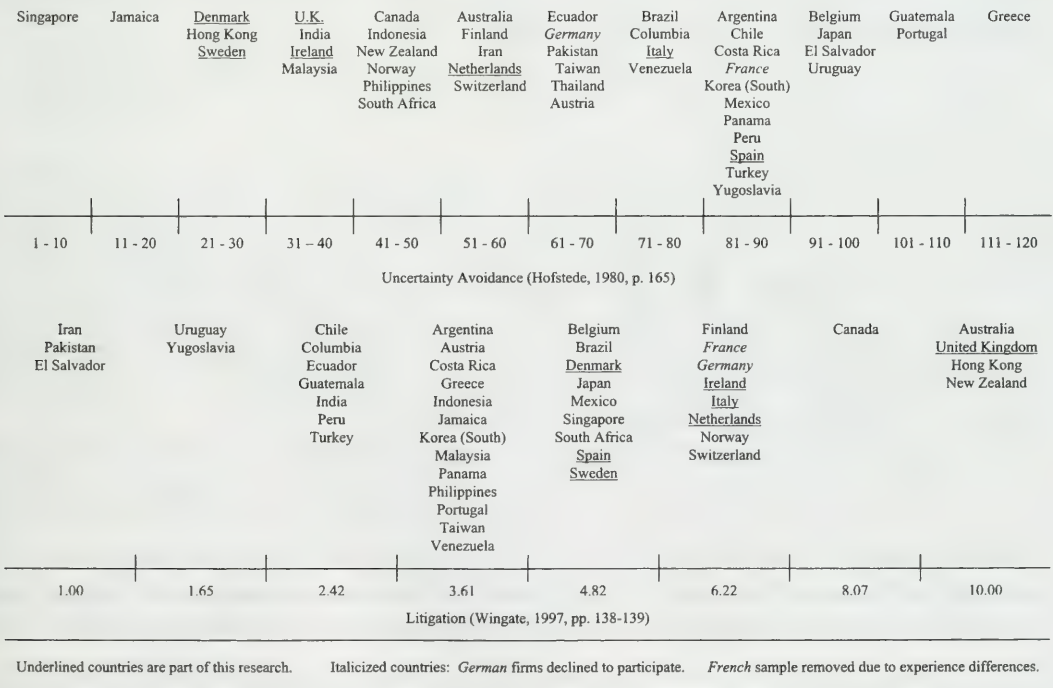


Fig. 1. A comparison of litigation and uncertainty indices.

German firms declined to participate just prior to beginning the data-collection process. The French data were not used because of experience differences between it and the remaining samples; however, the final model would not have substantially changed had the sample from France been included in the analysis. For the seven remaining countries, there are six unique Uncertainty Avoidance scores (the UK and Ireland have identical scores) with a range from 23 to 86, and three litigation scores that range from 4.22 to 10.00.² The seven remaining countries represent three of the five “cultural areas” that make up Europe:

1. More-developed Latin (Belgium, *France*, *Italy* and *Spain*);
2. Near Eastern (Greece);
3. Germanic (Austria, *Germany*, and Switzerland);
4. Anglo (*Ireland* and the *UK*); and
5. Nordic (*Denmark*, Finland, *The Netherlands*, Norway, and *Sweden*).

2.2. Materiality

Recent pronouncements by the national and international accounting and auditing boards do not require disclosure of materiality estimates. Within the European community, the lack of specific guidance could imply that the standards already in place ensure an acceptable level of comparability. The IASC defines the concept of financial statement materiality in the International Accounting Standards as (IASB, 1999b):

Information is material if its omission or misstatement could influence the economic decisions of users taken on the basis of the financial statements . . . Thus, materiality provides a threshold or cut-off point . . .

While the establishment of such a cut-off is a common auditing procedure throughout the world, the judgment of the individual auditor or audit team is the basis for determining the size of materiality within a specified audit. Various factors indigenous to a specific audit are the basis for this judgment; these factors include, but are not limited to, the quality of the internal control system and the auditor’s perceptions of management’s integrity. Although successful completion of the attestation service requires a materiality cut-off level, the size of the materiality estimate is not static; client-specific factors, the culture, and the level of litigation in the country could influence it (Gray, 1988).

De Matinis and Burrowes (1996) note that Australia, New Zealand, Canada, Fiji, and South Africa include examples of rules of thumb for materiality in their standards. However, Bernardi and Pincus (1996) note that most European countries have not taken this step towards formalizing materiality estimates. In their statement in 1995 on the “Interpretation of Materiality in Financial Reporting,” the Institute of Chartered Accountants in England and Wales (ICAEW) cautions auditors to consider the implications of “Published Guidance.” For

² The problem of a limited litigation range (i.e., 4.82–10.00) is not unique to Europe. For South America, there are only four indices (i.e., 1.65, 2.42, 3.61, and 4.82) with a spread of 3.17 points.

instance, fully diluted earnings per share must be disclosed when there is a 5% or more difference between it and basic earnings per share, which is the UK's one explicit materiality rule. Another materiality inference concerns acquisitions and mergers where material minority interests are defined as 10%. The interpretation ends with rules of thumb on materiality (par. 34c) cited from the SEC of the United States.

The staff of the US Securities and Exchange Commission has an informal rule of thumb that items and errors of more than 10% are material, those between 5% and 10% may be material and those under 5% are usually not material. These percentages are applied to gross profit, net income, equity and any specific line item in the financial statements that is potentially misstated.

2.3. *Client integrity*

The international framework for financial statements (IASC, 1999b) indicates that both quantitative and qualitative factors influence materiality and that materiality “provides a threshold or cut-off point.” The International Standards on Auditing of the International Federation of Accountants (IFA) state that audits should consider “the risk of material misstatement in financial statements resulting from fraud or error” (IFA, 1999a). To begin with, the integrity of a client's management is a consideration in acceptance and retention of clients (IFA, 1999b). The International Auditing Standard on Fraud and Errors also associates risk with client integrity (IFA, 1999a). This standard says that “conditions or events which increase risk of fraud or error include: Questions with respect to the integrity or competence of management.”

The issue of client integrity falls back on the basic legal premise that additional precautions should be taken when dealing with an accident-prone individual (Harper & Fleming, 1956). Ponemon and Gabhart (1993) found that audit-risk assessments relate to client integrity. Bernardi (1994a) found that US auditors provided with background data that client integrity was low examined significantly more data about this rating than auditors provided with background data that client integrity was high or client-integrity data was not available. Anderson and Marchant (1989) found that low integrity had a greater effect than high integrity in decision making. Low integrity ratings also increased auditors' probability of fraud estimates (Bernardi, 1997). The international standards indicate that audit risk should vary inversely with both client integrity and materiality (IFA, 1999c) and that client integrity varies inversely with audit risk. Anecdotal evidence indicates a reduction in materiality due to client integrity (Estes & Reames, 1988, p. 291):

[O]ne audit client was infamous throughout the staff for trying to ... understate current payables, to improve the current ratio and thereby satisfy the bank that held the company's notes. Our materiality threshold was generally lower on this engagement than on others.

Cobert (1996) found that materiality should decrease when client integrity decreases audit risk increases. Therefore, when compared to the level of materiality for a high-integrity client, auditors performing an audit for a low-integrity client should decrease materiality to

compensate for increased audit risk. Hypothesis 1 tests this relationship on a sample of European auditors.

Hypothesis 1: Auditors will establish lower materiality cut-off levels in situations where the auditor perceives the client to be at a lower level of integrity.

2.4. Cultural differences

Gray (1988) suggests that external and ecological factors, institutional consequences, and the societal values of a culture (Hofstede, 1980) influence the process that produces accounting values and systems. Gray maintains that accounting values and Hofstede's constructs are interwoven. Using Hofstede's cultural areas (i.e., those used in this research are Anglo, Nordic, and more-developed Latin), Gray introduces two-dimensional frames that combine his accounting values of professionalism with uniformity and conservatism with secrecy. Given Gray's (p. 12) accounting values of professionalism and uniformity, one would expect more flexibility and professionalism to be associated with the Anglo and Nordic countries and more uniformity and a movement towards statutory control in the more-developed Latin countries. Likewise, Gray's (p. 13) accounting values of conservatism and secrecy lead us to expect that optimism and transparency are associated with the Anglo and Nordic countries and secrecy and conservatism to be associated with the developed Latin countries. These expectations fit the descriptions of code versus common law countries in Meek and Saudagaran (1990).

Agacer and Doupnik (1991), Arnold and Bernardi (1997), Cohen, Pant, and Sharp (1995), Doupnik and Salter (1995), Kachelmeier and Shehata (1997), Lampe and Sutton (1995), and Siegel, Omer, and Karim (1997) note that cultural differences have explanatory properties in accounting research. Collins and Bloom (1997) posit that the development of accounting systems may be a function of a country's culture. Zarzeski (1996) notes that more investor-oriented information findings are associated with countries that are more open in their business and financial relationships. Users of financial statements should be interested in nonaudit client variables. These variables could indicate that audits performed by different auditors throughout the world might be different in terms of their inherent level of accuracy.

Culture is a system of shared values and beliefs that represent a "set of likely reactions of citizens with a common mental programming . . . reactions need not be found within the same persons, but only statistically more often in the same society" (Hofstede, 1991, p. 112). Uncertainty Avoidance suggests a cultural difference in the amount of tolerance for uncertainty of a specified people (Hofstede, 1980). It represents the collective willingness of a society to tolerate ambiguous outcomes (Cohen et al., 1995). Hofstede (1980, p. 116) maintains that "[a]ccounting . . . absorbs uncertainty to such an extent that it absorbs all of the usable information as well."

Salter and Niswander (1995) conducted a test of Gray's theorized relationships between accounting values and Hofstede's (1980) four cultural constructs. They found that, of Hofstede's four cultural constructs, only Uncertainty Avoidance was significantly related to

all of Gray's accounting values. Salter and Niswander (p. 391) found that "other culture-based variables do not appear to be as closely related to accounting values as anticipated by Gray." These authors also note that Uncertainty Avoidance correctly predicts Gray's professionalism, uniformity, conservatism, and secrecy for a country 80% of the time.

Hofstede's choice of the term Uncertainty Avoidance for his construct may bias our perceptions. For example, we might assume that to avoid uncertainty, auditors from high Uncertainty Avoidance countries would increase the level of disclosure in financial statements. However, this has not been proven to be the case. In a study of 39 countries, Wingate (1997) examined the association between the inclusion or omission of 90 suggested disclosure requirements used in the Center for International Financial Analysis and Research's disclosure index (Bavishi, 1991) and Hofstede's Uncertainty Avoidance construct. She found that financial-statement disclosures of major companies within each country were negatively associated with Hofstede's Uncertainty Avoidance construct, so that the higher the Uncertainty Avoidance score for a country, the lower the level of disclosures.³ Douppnik and Salter (1995) also found that countries with higher Uncertainty Avoidance scores tended to have lower levels of accounting disclosures.

Douppnik and Salter's and Wingate's finding of a negative association between Uncertainty Avoidance and disclosures in financial statements challenges our preconceived notions about the actual meaning of the term Uncertainty Avoidance. While auditors would assume that as Uncertainty Avoidance increases materiality would be lowered to perform a more precise audit, Wingate's research leads to the opposite hypothesis. Douppnik and Salter's and Wingate's research lead to the premise that materiality estimates will increase as Uncertainty Avoidance increases. The second hypothesis deals with the association between Hofstede's Uncertainty Avoidance construct and materiality. This hypothesis uses the average materiality estimate for each country as a parallel construct to Hofstede's Uncertainty Avoidance score because both represent the most probable response of their society.

Hypothesis 2: Materiality estimates are associated with a country's Uncertainty Avoidance construct.

2.5. Litigation

Gorelik (1994) maintains that legal factors played an important role in the historical development of accounting and auditing standards. In recent years, the increase in contingent fees and class action suits fueled the litigious environment whose outgrowth is the level of specificity required in accounting and auditing disclosures (Collins & Bloom, 1997). These disclosure requirements mark a country's legal system (e.g., code vs. common law), which predicts the emergence of two classes of accounting systems (Douppnik & Salter, 1995).

³ The associations between materiality and the independent variables of Uncertainty Avoidance (Hofstede, 1980) and litigation (Wingate, 1997) may not be the same as posited in Hypotheses 1 and 2 because disclosure (Wingate) and materiality related to inventory balances are not the same.

Over the past few years, there has been a decrease in the profession's public image (De Matinis & Burrowes, 1996) and a corollary increase in the litigation against auditors (Collins & Bloom, 1997) because of their failure to meet investors' needs (i.e., the expectations gap). De Matinis and Burrowes suggest that firms implement alternate measures and reports to narrow the expectations gap and in the process reduce litigation against auditors. Jennings, Kneer, and Reckers (1996) believe that the profession should provide quantitative guidance for materiality because of inconsistencies in materiality judgments.

One might expect that a lower precision audit (i.e., higher materiality) has a higher likelihood of failure and litigation than a more precise audit (i.e., lower materiality). It can be argued that less precise audits (i.e., using higher materiality levels) might contribute to litigation against auditors. One could then argue that as rational individuals, auditors in that country would start to use more stringent (i.e., lower) materiality estimates if the cost of litigation exceeds the cost of additional audit work. However, meeting the public's expectations is a "moving target." After auditors lower their materiality to provide a more precise audit, the question then becomes: "Did they lower them sufficiently to produce an audit that meets the public's needs?" If the litigation rate continues to increase or remains the same, then the public is saying in effect that audits need to be even more precise. If this is the case, the relationship between materiality (audit precision), the auditing environment, and the audit report is an iterative process. Auditors should continue to reevaluate the auditing environment for indications that the investing public is satisfied with their product or until the cost of the additional audit work exceeds the costs of litigation. One would anticipate that countries with higher (lower) litigation rates use higher (lower) materiality levels that result in less (more) precise audits.

An interesting contrast in Wingate's (1997) study of 39 countries is that, while Uncertainty Avoidance was negatively associated with the disclosure of financial information, high-disclosure countries were more likely to have high litigation rates. Therefore, withholding information from investors appears to benefit companies in high Uncertainty Avoidance countries through lower litigation. The third hypothesis deals with the association between the litigation index used by Wingate (1997) and materiality. This hypothesis also uses the average materiality estimate for each country as a parallel construct to Wingate's litigation index because both represent an average for their society. Wingate's litigation index will be explained more fully later in the study.

Hypothesis 3: There will be a positive association between the average materiality estimate for a country and that country's level of litigation.

2.6. Differences between the United States and European countries

The Securities and Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB) do not believe that it is in the best interest of investors to increase the globalization of capital markets at the expense of the quality of financial reporting. The SEC and FASB insist that high-quality disclosure rules and professional standards protect investors

(Levitt, 1998). However, the passage of the Litigation Relief Act (1995) in the United States reduced the extent of damages that can attach to public-accounting firms so far as public companies annual statements are concerned. This factor, coupled with a movement to strategic auditing and some peoples' beliefs that financial statements are not as important in analyzing companies' prospects as they were in the past, generally suggests that litigation may have lessened in the United States. It also suggests that materiality measures today may differ in a more relaxed direction. SEC Staff Accounting Bulletin (SAB) No. 99 (1999) may actually be an effort to counter this relaxation. Society (in the form of the SEC) had to step in with SAB 99 and force more stringent materiality levels on US auditors where their clients' may intend to manipulate earnings.

National accounting communities are developing comparable approaches to harmonization of auditing standards, such as include the determination and disclosure of materiality standards (Pratt & Van Peursem, 1996). The compelling argument for specific materiality guidance is that without this guidance "auditor judgments may lack consistency due to differing judgments about the magnitude of an error or omission considered to be material" (Bernardi & Pincus, 1996, p. 2). However, emphasizing quantitative materiality thresholds could result in ignoring qualitative considerations that should also influence materiality (Bernardi & Pincus, 1996). The Accountants International Study Group (1974, par. 28) argued that users of financial statements might benefit from knowing specific quantitative materiality thresholds:

Guidelines would facilitate comparability and eliminate greatly diverse results under similar circumstances . . . It is an obligation of the accountant to all users of financial statements to narrow areas of diversity and encourage meaningful comparisons.

The harmonization of European accounting standards (Collins & Bloom, 1997) should lead to comparable financial statements for the countries in the European Community (Turner, 1983). Audits conducted in Europe to reflect the "true and fair" standard of the Fourth Directive should be of similar precision as reflected by materiality estimates. If this were the case, one would anticipate that US and European materiality estimates should be similar.

Hypothesis 4: European materiality estimates will be similar to those from the United States.

3. Research design

3.1. Subjects

The intent of the study was to use only subjects with at least 5 years of audit experience (i.e., managers or above). This precaution was taken because both Bernardi (1994b) and Bernardi and Arnold (1994) found that, while managers, including senior managers, were sensitive to cues on integrity, seniors were not sensitive to these cues. When the data were

collected, we noted that all but one auditor from France was a senior, and that the samples from Sweden and the UK included only one senior. Additionally, seniors from two of the four participating firms were not responsible for materiality computations. Given these experience differences, all seniors were dropped from the sample (i.e., its original intent), which eliminated France from the sample.⁴ The final sample includes 181 auditors from 16 European offices of four Big-Six firms located in Denmark, Ireland, Italy, The Netherlands, Spain, Sweden, and the UK. There were 25 partners (13.8%), 67 senior managers (37.0%), and 89 managers (49.2%) in the sample. The audit experience of the participants was between 5.0 and 25.0 years (mean of 9.9 years).

The US sample came from offices located in most major cities within an area enclosed by Boston, Philadelphia, Indianapolis, Detroit, and Buffalo (Bernardi & Arnold, 1994). We reduced this sample of 152 managers and senior managers to 83. Of those eliminated, 30 were from a firm that did not participate in this study; the other 39 did not receive an integrity rating (i.e., Bernardi and Arnold's "no information" group). There were 31 senior managers (38.6%) and 52 managers (61.4%) in the sample. The audit experience of the remaining US auditors was between 5.0 and 13.0 years (mean of 8.1 years).

3.2. Research instrument

The research instrument consisted of an audit case scenario with selected quantitative and qualitative information on the client. The client-specific quantitative data commonly used to estimate materiality (Pany & Wheeler, 1989) provided in the case study included: total assets, total inventory, total equity, total revenue, gross profit, pretax income, and an evaluation of client integrity (Appendix A). Using Pany and Wheeler's (1989) 10 rules of thumb for materiality estimates, the data provided in the research instrument (Appendix A) generated a range of materiality estimates of US\$122,333 to US\$286,380 with a mean of US\$198,037. Because of time limitations, Bernardi and Arnold (1994) and Bernardi and Pincus (1996) used the materiality range developed from Pany and Wheeler to create nine materiality "bins" (i.e., US\$0–50,000, US\$50,001–100,000, . . . US\$350,000–400,000, and Over US\$400,000). The "Over US\$400,000" category was established by doubling the mean for the rules of thumb. We discussed the case and materiality issues with managers and partners from Big-Six firms prior to the original study; these US auditors doubted that an auditor would estimate materiality above US\$400,000. One of the limitations of Bernardi and Arnold (1994) and an area they suggest for future research was to ask auditors to estimate materiality as an open-ended question. In this research, the audit scenario used by the European auditors was the same as the one used by Bernardi and Arnold (1994) and Bernardi and Pincus (1996); however, we asked the auditors to estimate materiality as an open-ended question:

How large must an error in the inventory account be before it is considered material (smallest size to be material)?

⁴ The model would not have substantially changed had seniors been included in the analysis.

We sent the scenario and questionnaire to the contact person (i.e., usually the director of human resources or office managing partner) for each of the 16 offices. They were asked to read the questionnaire and determine whether it was still meaningful. These individuals indicated that the questionnaire and scenario were clearly written and their intent was still valid. We also asked each office's contact person to determine whether the questionnaire (Appendix A) should be presented in the country's language. Only the offices in two of the seven countries (Italy and Spain) requested that their country's language be used. For these two countries, a person first translated the survey questionnaire into that country's language. Then a second person translated the questionnaire back into English to ensure that the initial translation correctly reflected the exact intent of the survey.

The financial data part of the questionnaire was always presented in the local currency. We took the exchange rates used to translate the original data from the *Wall Street Journal* about 2 months prior to the lead author's travel date. To guard against possible exchange rate fluctuations, we translated the data on the returned questionnaires back to dollars using the exchange rate for the day of the lead author's visit to each office.

3.3. Procedures

The lead author delivered the surveys to each of the European offices. These visits established a positive contact and insured a consistent explanation of the survey. The contact person at each office was asked to distribute the surveys at random to managers, senior managers, and partners. The lead author requested that anyone who had experienced an extended assignment outside his/her home country should not be part of the sample. To preclude problems, we also included a background questionnaire as part of the survey instrument. This questionnaire requested information on staff level, experience, age, gender, and nationality. Part of the experience response included a question concerning whether the participant had been assigned to an office outside their country for a year or more. The purpose of these questions is to ensure that the sample is representative of that country. As mentioned previously, several offices from various countries gave seniors the research instrument; these seniors and three auditors who were on an extended exchange program outside their country were eliminated from the sample.

3.4. Dependent variable

Even though there were differences in the staff levels responding to the survey by country, multiple comparison tests indicate that materiality estimates did not vary by staff level ($P=.76$) or by firm ($P=.22$). Because these two factors did not differ, we collapsed the data by staff level and firm for the remainder of the research (Table 1). Because Hofstede's Uncertainty Avoidance index is the average reaction of individuals from each country, materiality estimates were averaged to produce a most likely estimate by country and client-integrity type. This procedure produced 14 unique materiality

Table 1
Data and indices on dependent and independent variables

Country (group)	Materiality estimate	Client integrity	Litigation indices	Uncertainty Avoidance	Sample size	Experience
Denmark	252.5	High	4.82	23	14	9.2
	215.9	Low	4.82	23	15	8.5
Ireland	322.9	High	6.22	35	13	10.7
	275.2	Low	6.22	35	10	10.4
Italy	496.9	High	6.22	75	21	10.7
	422.5	Low	6.22	75	18	10.4
The Netherlands	464.0	High	6.22	53	8	8.4
	285.2	Low	6.22	53	13	8.7
Spain	497.0	High	4.82	86	5	9.2
	302.1	Low	4.82	86	6	8.5
Sweden	383.5	High	4.82	29	9	7.4
	313.1	Low	4.82	29	14	9.4
United Kingdom	448.2	High	10.00	35	19	7.9
	409.5	Low	10.00	35	16	10.3
European mean	408.2	High	na	na	89	9.6
	323.5	Low	na	na	92	10.2
United States	232.3	High	15.00	46	41	8.0
	201.2	Low	15.00	46	42	8.2

European mean uses the 89 (92) auditors in the high (low)-integrity client groups.

estimates (i.e., two for each country) that we used as the dependent variable for Hypotheses 1–3. Table 1 shows the means of the data; for all countries, the high-integrity estimates were larger than the low-integrity estimates. The overall mean materiality for the 181 European auditors was US\$408,200 (US\$323,500) for the high (low)-integrity group.

Given the nine materiality “bins” from Bernardi and Arnold (1994) and Bernardi and Pincus (1996), we used the average of each range as the materiality estimate for the auditors from the United States. For example, US\$25,000 was used for the “US\$0–50,000” bin, US\$75,000 for the “US\$50,001–100,000,” and US\$125,000 for the “US\$100,001–150,000” bin. To be consistent, we used US\$425,000 for the “Over US\$400,000” bin; there were only six auditors from the sample of 83 who estimated materiality over US\$400,000. The US auditors estimated materiality at US\$232,300 for the high-integrity client ($n = 41$) and US\$201,200 for the low-integrity client ($n = 42$).

3.5. Independent variables

The only actual difference in the case study materials that the auditors received was the evaluation of client integrity (Appendix A). About one-half of the subjects received cases that indicated a relatively high level of perceived integrity for the client (i.e., a ranking of “2”). We provided the other subjects with cases that indicated a relatively low level of client integrity (i.e., a ranking of “8”). The integrity rating was purposely given twice on the

research instrument—initially and immediately before the research question. While some may believe that this repetition created a demand effect, we do not believe this to be the case. We repeated our rating because representatives of the participating firms said that an evaluation of low integrity would be signaled throughout the client's work papers. The format for client-integrity evaluation was shown to representatives of all participating firms in both the United States (Bernardi & Arnold, 1994) and Europe. These representatives said that its intention was clear and approximated what their firm used. In fact, it nearly replicated the format used by one of the firms.

Uncertainty Avoidance is a “set of likely reactions of citizens with a common mental programming” (Hofstede, 1991, p. 112). Hofstede's (1980) Uncertainty Avoidance scores (Table 1) were the result of sampling over 100,000 employees from the 53 countries of a large multinational corporation. The only significant association in our European sample ($n=7$) was between Uncertainty Avoidance and Power Distance. Uncertainty Avoidance and Power Distance are nearly perfect surrogates for each other in our sample (i.e., a .96 correlation). However, while the range on Power Distance for our sample was 18–57 (i.e., a spread of 39), the range for Uncertainty Avoidance was 23–86 (i.e., a spread of 63). We used Uncertainty Avoidance in the analysis because it has wider range, which should provide greater discriminatory power.

The litigation index used in the research evolved because a Big-Six firm had been billed one premium for all of its international operations. In an effort to allocate the premium equitably among the individual country partnerships, the firm hired an insurance underwriter to develop a measure of litigation for countries where they had offices (Table 1). The litigation indices “represent the risk of doing business as an auditor in a particular country” and range from 1 to 10 (Wingate, 1997, p. 140). The indices were developed from data that included:

1. all international audit firms' claims experience;
2. other professional firms (i.e., lawyers, engineers, etc.) claims information;
3. legal and regulatory environments;
4. political and economic environments; and
5. the professional accounting environment in the country.

Wingate (p. 140) cautions that the data (and therefore the indices) only contain publicly available information on claims and other costs. Consequently, if audit liability claims in a specific country were settled privately, they would not be factored into the computation, which results in a downward biasing for that country.

The seven European countries provide two sets of contrasts. There are two countries with identical Uncertainty Avoidance scores (i.e., 35 for Ireland and the UK); each has a different litigation index. This is also true for the litigation; there are two indices (i.e., 4.82 comprising Denmark, Sweden, and Spain, and 6.22 comprising Ireland, Italy, and The Netherlands) with no duplication of Uncertainty Avoidance scores in either group.

An examination indicates that, while we correlated all three independent variables to materiality, none of the variables significantly correlate to each other (i.e., multicollinearity is

not a problem). Wingate found that the litigation scores developed by the insurance underwriter for the 49 countries in her study related significantly to Hofstede's Uncertainty Avoidance score. While these two variables correlate to each other for the 14 European countries ($P=.08$), these factors were not related ($P=.61$) for the seven countries in the current sample.

4. Analysis

4.1. Hypotheses

Table 2 shows the regression model for the materiality estimates for the high- and low-integrity clients of the seven European countries. The average materiality estimates of the European auditors decreased by US\$91,640 between the high- and low-integrity clients (Hypothesis 1). This difference was significant ($P=.01$) and explained 25.6% of the variation in materiality estimates. This finding confirms the inverse relationship between risk and materiality (IFA, 1999c).

Hofstede's Uncertainty Avoidance was also a significant variable (Hypothesis 2) in estimating European materiality ($P=.004$). Uncertainty Avoidance was the most powerful explanatory variable; it accounted for 28.1% of the variation in materiality estimates.

Table 2
Regression model for materiality for the seven European countries

	<i>df</i>	SS	MS	<i>F</i>	Significance <i>F</i>
Regression	3	85,623.4	28,541.2	9.75	.0026
Residual	10	29,258.8	2925.9		
Total	13	114,882.2			

	Coefficients	Standard error	<i>t</i> Statistic	<i>P</i> value
Intercept	140.74	68.76	2.05	.0679
Integrity	- 91.64	28.91	- 3.17	.0100
Uncertainty	2.42	0.65	3.72	.0040
Litigation	24.70	8.62	2.86	.0168

Regression statistics	
Multiple <i>R</i>	.863
<i>R</i> ²	.745
Adjusted <i>R</i> ²	.689
Standard error	54.09
Observations	14

Integrity: 0 for high-integrity client; 1 for low-integrity client.

Uncertainty: Uncertainty Avoidance (Hofstede, 1980).

Litigation: litigation index (Wingate, 1997).

Wingate's finding, using Hofstede's (1980, 1991) work, supports an increase in materiality for higher Uncertainty Avoidance scores. The model (Table 2) indicates that, as Uncertainty Avoidance increases by 10 points, the average materiality estimate would also increase by US\$24,200.

Table 2 also shows the regression coefficients and significance for the litigation variable. As anticipated (Hypothesis 3), the litigation variable was significant ($P = .017$) and explained 13.7% of the variation. Litigation increased by US\$24,700 for a one-point increase in the level of litigation. The coefficients of the litigation and Uncertainty Avoidance variables reflect their ranges; the difference in the magnitudes of the two scales is significant. While Uncertainty Avoidance goes from 23 to 86, litigation is from 4.82 to 10.0 (i.e., uncertainty is a factor of about 10 higher than litigation). Had we scaled Uncertainty Avoidance by multiplying it by 10, the coefficients would have been 24.20 for litigation and 24.70 for Uncertainty Avoidance.

Hypothesis 4 was tested using a variation of the Dunn multiple comparison procedure that treats the materiality estimates from the United States as a control group and compares the European countries to it. Significant differences were found (Hypothesis 4) between the materiality estimate for the high-integrity client between the estimates of auditors from the United States (US\$232.3) and Ireland (US\$322.9, $P = .08$), Italy (US\$496.9, $P = .001$), The Netherlands (US\$464.0, $P = .02$), Spain (US\$497.0, $P = .005$), Sweden (US\$383.5, $P = 0.04$), and the UK (US\$448.2, $P = .001$). For the low-integrity client, significant differences exist between the United States (US\$201.2) and Ireland (US\$275.2, $P = .10$), Italy (US\$422.5, $P = .02$), The Netherlands (US\$285.2, $P = .06$), Sweden (US\$313.1, $P = .08$), and the UK (US\$409.5, $P = .001$).

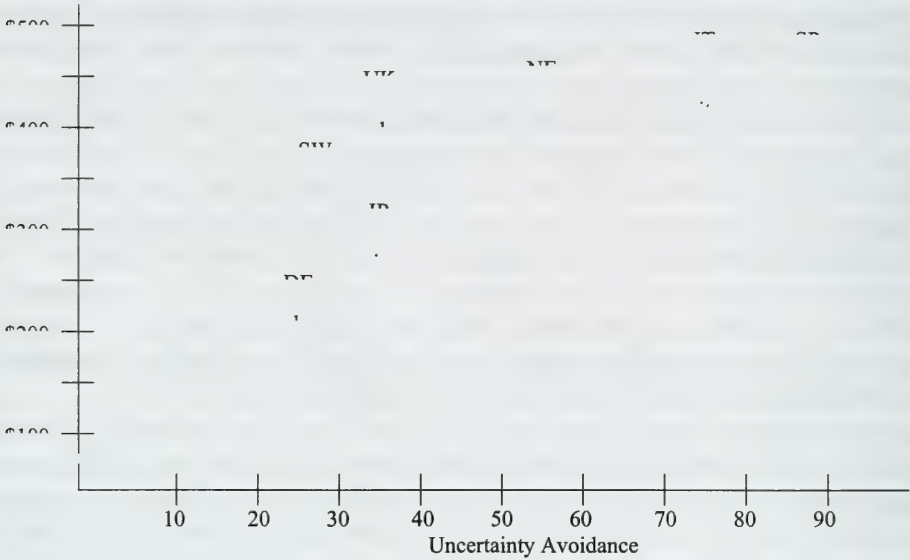
4.2. Possible interactions

Fig. 2 shows the range of materiality estimates for the high- and low-integrity ratings for Uncertainty Avoidance and litigation. The plots show that the range materiality estimates narrows for both Uncertainty Avoidance and litigation for the low-integrity client. In both cases, the materiality estimates decrease, which indicates a sensitivity to risk information. However, materiality increased for countries that are classified as more conservative (i.e., with Uncertainty Avoidance) and for countries with increased risk of doing business as an auditor.⁵

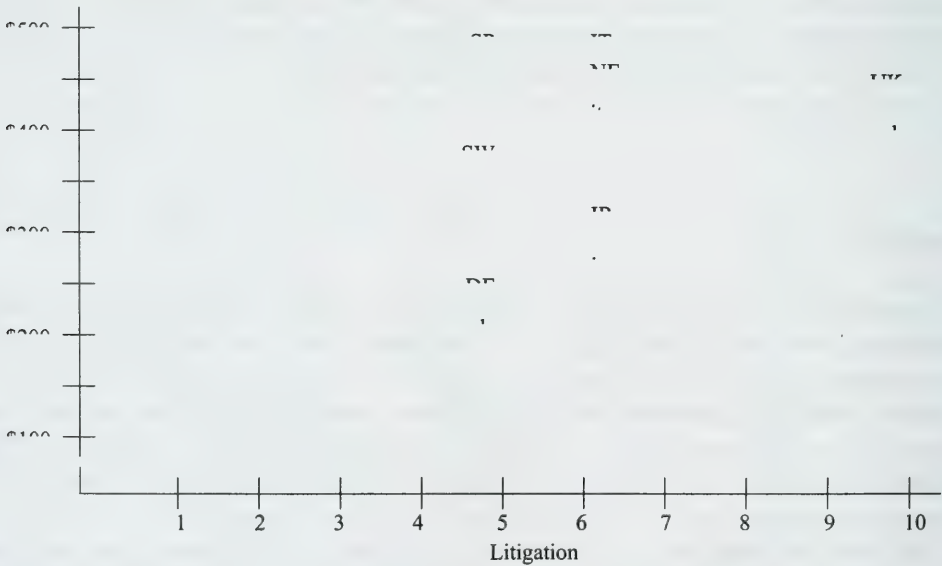
The data indicate that whether litigation or Uncertainty Avoidance was the major factor in materiality estimates may depend on client integrity. For example, Uncertainty Avoidance was the major factor ($r^2 = .41$) with high-integrity clients. This supports

⁵ The data in Fig. 2 show dramatic adjustments for low-client integrity for Spain and The Netherlands. Without Spain and The Netherlands, the model has an adjusted r^2 of .74 for Denmark, Ireland, Italy, Sweden, and the UK. If the model includes the United States and the seven European countries, the adjusted r^2 is .42.

Panel A: Materiality and Uncertainty Avoidance



Panel B: Materiality and Litigation



UPPER CASE Materiality estimates for the High Integrity Client (000)
 Lower Case Materiality estimates for the Low Integrity client (000)

Fig. 2. Materiality, Uncertainty Avoidance, and litigation.

Wingate’s results showing that disclosure decreased as Uncertainty Avoidance increased. For the low-integrity client, the data indicate that litigation was now the primary factor

($r^2 = .65$) and that the relationship is in a positive direction, which agrees with our premise that countries with higher litigation rates perform less precise audits. However, interactive terms were not analyzed because of our limited sample size.

5. Discussion

5.1. Users' needs

Financial statements fulfill different roles on the European continent when compared to the United States and the UK. For instance, Saudagaran and Meek (1997, p. 131) note that continental European countries (the UK and United States) have a code (common) law legal system that dominates the environment and are usually (less) uncertainty avoidant and rely less on (have strong) stock markets. Meek and Saudagaran (1990, p. 150) note that when banks (capital markets) dominate the financing environment creditor (shareholder) protection is emphasized. Wingate (1997, p. 141) finds that Uncertainty Avoidance, which is associated with countries that rely more on debt financing, is negatively associated with the level of actual disclosure by corporations within specific countries. Douppnik and Salter (1995) find that lower levels of disclosure associate with countries with higher Uncertainty Avoidance scores.

The requirements for inflation accounting also differ for the countries in this research. While Denmark, Italy, Spain, and Sweden have no requirements for additional disclosures, The Netherlands, Ireland, UK, and the United States allow optimal supplementary current cost information (Coopers & Lybrand (International), 1993). Salter and Douppnik (1992) studied the relationship between legal and accounting systems and found similar country groupings. Finally, Biddle and Saudagaran (1991) note that disclosure requirements influenced management's choice of stock exchanges.

Consequently, one might expect that primary users of financial statements in debt-financed countries have information other than that contained in the financial statements. One might also expect auditors in these countries to be less concerned about the accuracy of the financial-statement information (e.g., less stringent materiality standards) than auditors from equity-oriented countries. On the other hand, auditors and societies that rely on equity funding are likely to have different views of how stringent materiality should be. If this is the case, then it may not be surprising that the United State, UK, and Ireland, which were the only common-law countries with equity-oriented financing arrangements, were the countries that provide specific quantitative materiality guidelines.

5.2. Uncertainty Avoidance

The view of reducing materiality may not apply to auditors from high Uncertainty Avoidance societies because their views may not be consistent with what others in their society believe in terms of rigidly set materiality standards. Thus, setting materiality

artificially high will serve to create a level of pseudo certainty. To illuminate our Uncertainty Avoidance result, we sent Hofstede an explanation of materiality's role in auditing and our results. In his response, Hofstede (1998) suggests that auditors' "self-protection is behind the rules of the profession." Cyert and March (1963, p. 119) support this view, noting that organizations avoid uncertainty by:

[A]void[ing] the requirement that they anticipate the future reactions to other parts of their environment by arranging a negotiated environment. They impose plans, standard operating procedures, industry tradition, and uncertainty-absorbing contracts on that situation by avoiding planning where plans depend upon prediction of uncertain future events, and by emphasizing planning where the plans can be made self-confirming by some control device.

Meek and Saudagaran (1990) and Saudagaran and Meek (1997) note that in statutory countries (e.g., continental Europe) the thought process believes that what is not forbidden is therefore allowed. Thus, for our sample of continental auditors, we might expect them to wish to be right. If this is the case, then these auditors would expand materiality estimates so that any remaining errors are not material (and therefore not errors). For example, KPMG's Business Measurement Process (Bell, Marrs, Solomon, & Thomas, 1996) implies the deemphasizing of traditional materiality limits in today's US practice environment. Using Hofstede's (1980) rationale, this process assures audit effectiveness but also "absorbs all of the usable information as well" (p. 116).

5.3. *Specific materiality guidelines*

The difference in the scales used in this research and the US data may limit the validity of our findings. The data for the US sample used a nine-bin scale that may have created a demand effect. The midrange of US\$200,001–250,000 includes the US estimates for the high (low)-integrity client of US\$232,300 (US\$201,200). The European samples had an open-ended response, which they most likely used to reach higher means. However, the data indicate that the auditors from the United States, UK, and Ireland followed the specific materiality guidelines in their accounting standards. The US data used in Bernardi and Arnold (1994) and Bernardi and Pincus (1996) were gathered in late 1990 to mid 1991. At this time, the accounting standards in the United States included a 3% materiality guideline (APB Opinion No. 15, par. 15, 1969) for diluted earnings per share. When the current data were gathered in 1997, the Published Guidance from the UK cited earlier in effect indicated that "errors of more than 10% are material, those between 5% and 10% may be material and those under 5% are usually not material. These percentages are applied to ... any specific line item in the financial statements that is potentially misstated."

Given the "Published Guidance" section of the UK's standard on materiality, auditors from the UK could have estimated materiality between US\$328,607 (5% of inventory) and US\$657,214 (10% of inventory) from the questionnaire data (Appendix A). The actual UK estimate for the high-integrity client was US\$448,200 (6.8%). Using the US rule of 3% for diluted earning per share as a guideline for materiality, the expected US estimate would

Table 3
Materiality levels in relation to rules of thumb for the high-integrity client

Range of estimate	Rules of thumb for estimating materiality	Dollar amount	United States		European sample			
			Number	Percent	With guidelines		Without guidelines	
					Number	Percent	Number	Percent
US\$50,000 or less			1	2.5	0	0.0	3	5.2
US\$50,001–100,000			2	4.9	0	0.0	1	1.8
US\$100,001–150,000	1.0% of total equity 0.6% of gross profit 0.27 × (net income) ^{0.89}	US\$122,333 US\$140,899 US\$147,415	4	9.7	0	0.0	5	8.8
US\$150,001–200,000	0.5% of total assets Leslie's blend	US\$178,850 US\$188,077	6	14.6	3	9.4	3	5.2
US\$200,001–250,000	3.9% × (revenue) ^{0.86} 5.0% of pretax income KPMG audit gauge	US\$206,521 US\$211,921 US\$237,881	14	34.2	4	12.5	1	1.8
US\$250,001–300,000	14.7% × (pretax income) ^{0.92} 0.5% of total revenues	US\$259,173 US\$286,380	8	19.5	0	0.0	9	15.8
US\$300,001–350,000			1	2.5	6	18.8	7	12.3
US\$350,001–400,000			0	0.0	5	15.5	4	7.0
Over US\$400,000			5	12.1	14	43.8	24	42.1
Totals			41	100.0	32	100.0	57	100.0

Highlighted area contains the materiality estimates arrived at by using the 10 rules of thumb in Pany and Wheeler (1989).

Materiality ranges (i.e., US\$50,000 or less) are the bins used by Bernardi and Arnold (1994).

Average materiality for Pany and Wheeler's 10 rules of thumb is US\$197,945.

The countries that have (do not have) materiality guidelines are the United Kingdom and Ireland (Denmark, Italy, The Netherlands, Spain, and Sweden).

Adapted from Bernardi and Pincus (1996).

have been US\$197,164. This is close to the average estimate of US\$216,700 (3.3%) for managers and senior managers from the United States. For Ireland, the Ryan Commission recommended "the Irish accounting profession should realign itself formally with the US" (McHugh & Stamp, 1992, p. 429). Consequently, the average materiality estimate for the high-integrity client for Ireland should be within the same 5–10% range computed for the UK. The actual average estimate for the Irish accountants was US\$322,900 (4.9%), which was at the low end of the expected range. The data in Table 3 show that the estimates for the United States (34.2%) center not only on the mid value but also on a value that approximates the average for the 10 rules of thumb (US\$197,945) and the 3% materiality estimate in the US standards at that time. For the UK and Ireland, the majority of their

estimates (43.8%) are in the “Over US\$400,000” bin that includes the 10% rule of thumb from their Published Guidance.

Table 3 shows the materiality estimates for the United States and European countries. The data indicate that having quantitative materiality guidelines does not ensure a higher level of conformity in materiality estimates or more conservative materiality estimates. In fact, the average materiality estimate for the UK and Ireland (e.g., those countries with quantitative guidelines) of US\$397,300 was not substantially lower ($P = .72$) than the average estimate for Denmark, Italy, the Netherlands, Spain, and Sweden of US\$414,400. Given this evidence, the data do not support the call for including quantitative materiality guidelines in accounting and auditing standards.

While the 3% materiality guideline for diluted earnings per share was in effect during Bernardi and Arnolds’ (1994) and Bernardi and Pincus’ (1996) data gathering, this guideline no longer exists in the United States. The SEC has added SAB No. 99 (1999) on materiality, which occurred after our data gathering. SAB No. 99 requires auditors to consider other qualitative factors that would make errors of less than 5% materiality; a similar interpretation in the UK has not occurred.

6. Conclusions

The research provides four conclusions. First, European auditors lowered their estimates when told they were auditing a low-integrity client. Second, European materiality estimates are a function of Hofstede’s (1980) Uncertainty Avoidance. Third, European materiality estimates are positively associated with Wingate’s (1997) litigation indices. Fourth, European materiality estimates are higher than US estimates.

The sensitivity to client integrity noted in the findings should be encouraging given the growing concern of financial-statement users for auditors to detect fraud. The methodology used to gather the data supports this finding. Rather than ask each auditor to estimate materiality for two types of clients (i.e., one low integrity and one high integrity), the methodology asked experienced auditors (i.e., mean experience was 9.4 years) to estimate materiality for only one type of client. This prevented the participants from comparing their materiality estimates for the two client types; any comparison would ensure that the low-integrity client always received the lower materiality estimate. This sensitivity to a client risk factor should be of some consolation to those in the profession of public accounting due to the increased cost of defending against litigation.

There is an interesting implication of the finding on materiality varying with Uncertainty Avoidance. Most believe that harmonization would alleviate many of the problems experienced by international financial-statement users who attempt to compare financial statements from more than one country. However, the finding on Uncertainty Avoidance suggests that, even if international bodies harmonize or standardize the financial regulations and standards without explicit inclusions requiring the disclosure of materiality estimates, financial statements may still not be comparable to users. The differences in materiality estimates associated with each country’s Uncertainty Avoidance (Power Distance) score, as well as other national

factors, in effect limit the standard-setting bodies' purpose of achieving a harmonized set of financial statements.

The analysis indicates that the profession's concern should increase given the findings with respect to litigation. While the level of materiality set in an environment of lower litigation may be an accurate representation of the level of risk desired by the audit firm, the level of materiality set in a higher level of litigation is clearly not. This point raises the concern that a movement by European countries towards more equity-based financing or uniform standards of auditor liability might create a more litigious atmosphere than when the original litigation indices were calculated.

Limitations of the research include using only one case study involving an inventory account and one situation-specific factor (client integrity). The scope of the sample (i.e., only western European auditors) also impairs the generalizability of the findings. Other geographical areas (i.e., the Pacific Rim countries or South America) would be appropriate research areas for this topic. The findings also support further research into the effect of multiple scenarios and situational factors. The cultural indices used were those that relate to the cultural environments of 1975–1978 (Hofstede, 1980). This study assumes that people in western Europe have remained the same culturally since 1979. Allowing for these limitations, the relative diversity of the sample with respect to Uncertainty Avoidance (Hofstede, 1980) and litigation (Wingate, 1997) provide support for the research findings.

Two other limitations should also be noted. First, a source of concern is that, while Wingate's 1997 sample of the entire European Union showed that Litigation index and Uncertainty Avoidance score are highly correlated, ours do not show a significant correlation. Although this is good in a statistical sense, it is not in a sampling sense because two major European continental countries (i.e., France and Germany) were not included in the sample. Second, the theory development relies on papers that primarily deal with the US setting and few papers that deal with the international setting. While this is understandable, as there is so little information about auditor judgments in an international setting, studies set in the United States (Bernardi & Arnold, 1994; Bernardi & Pincus, 1996; Pany & Wheeler, 1989) may not be completely universal.

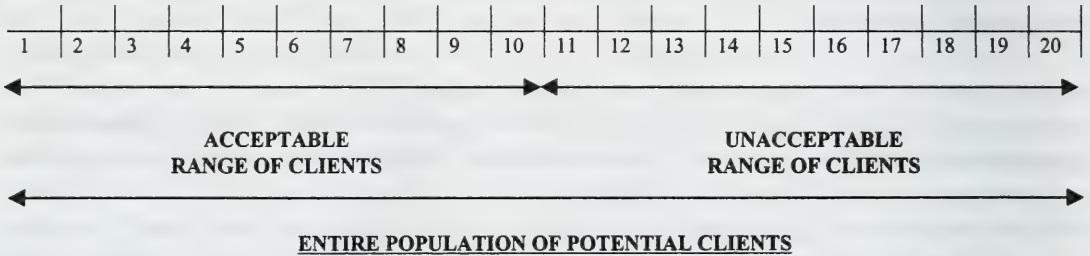
Future research should attempt to validate the hypothesis that European auditors are significantly different from the general population for the Uncertainty Avoidance. Research should also try to replicate the finding with respect to litigation to determine at what level the cost–benefit considerations prevail and materiality is lowered. Another possible extension would be to examine the countries that already have written quantitative guidelines for materiality in their standards to determine whether this actually affects the level of materiality.

Acknowledgments

We wish to thank the anonymous reviewers for their thoughtful comments, which made this a more comprehensive study.

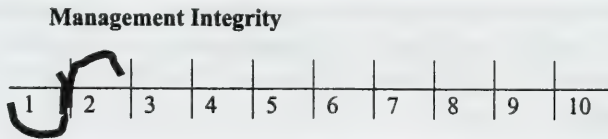
Appendix A. Materiality questionnaire

Assume that your firm has a policy of evaluating potential clients in several critical areas prior to accepting a new client. One of these areas is *Management Integrity*. Your firm believes that the entire population of potential clients can be described on a scale from 1 to 20. Your firm’s standard for an acceptable client is a rating from 1 to 10.



A.1. Entire population of potential clients

In your firm, this evaluation is an ongoing process for all clients. Clients who do not maintain a rating within the acceptable range (1–10) are carefully evaluated for continuation as clients. Client Five’s rating (circled value) has been stable since becoming a client and currently reflect the following evaluations.



Assume that you are the engagement manager for Client Five. As part of your ongoing audit planning process, you are computing the level of materiality for this client’s INVENTORY account, which is 18.3% of total assets. Assume that you compute your materiality estimate on a financial statement basis. The relevant financial statement data for this client are:

Amounts are in the currency of (country’s name)

Total assets	US\$35,770,004	Total revenue	US\$57,275,966
Total inventory	US\$6,572,135	Gross profit	US\$23,483,146
Total equity	US\$12,233,341	Pretax income	US\$4,238,422

Recall that the client has an integrity rating of 2 (where 1 is the highest integrity rating).
Question: In your opinion, how large must an error in the inventory account be before it is considered material (smallest size to be material).

Your Materiality Estimate

Note: The client-integrity rating in this appendix is given for the high-integrity client (the low-integrity client would have been rated an “8”). While all of the financial statement data are expressed in US dollars, they were expressed in whatever the country’s currency was if the country asked for local currency to be used rather than US dollars.

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Pergamon

The International Journal of Accounting
36 (2001) 485–490

The
International
Journal of
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Discussion of Arnold, Bernardi, and Neidermeyer “The association between European materiality estimates and client integrity, national culture and litigation”

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1. Introduction

Arnold, Bernardi, and Neidermeyer (2001) examine the differences in materiality-threshold estimates among auditors from seven European countries, and also compare their estimates with those of a group of auditors from the US. An investigation of this nature is important, in general, for at least two reasons. First, the International Accounting Standards Committee (IASC) has set forth as one of its goals, “the improvement and harmonization of regulations, accounting standards and procedures relating to the presentation of financial statements” (IASC, Sect. 9000A, para 2, 1992). Accounting research suggests that one likely factor that precipitates differences in accounting practices across countries is the culture of the country in which the practitioner operates (Wingate, 1997). Thus, the study of materiality estimates among auditors in different economic-accounting regimes of the world provides insight into likely inconsistencies accountants should consider if they are to proceed towards this stated goal of the IASC. Second, such an examination enhances the profession’s ability to recognize generally accepted accounting and auditing practices of different economic-accounting regimes across the world.

More specifically, it is important for us to understand two different things: (1) how materiality-threshold judgments and decisions are affected by *personal* characteristics of auditors such as their risk preferences, accounting conservatism, professional skepticism, knowledge, cognitive ability, and information-processing biases, etc., and *environmental* factors such as incentives, disincentives, frequency of litigation, and accounting regulation,

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etc.; and (2) how any of these personal characteristics and environmental factors tend to differ among different cultures and subcultures that produce the auditors (who make these materiality-threshold judgments on companies they audit).

This paper is an interesting attempt at studying some of these impacts on Big Six auditors' materiality-threshold estimates. It would appear at first glance that the authors try to operate within the first of the above two lines of inquiry. We say this because they have relied on previous research (primarily Hofstede, 1980, 1991; Wingate, 1997) to make assumptions on how personal characteristics of auditors and environmental factors tend to differ among different cultures and subcultures. However, if their research objectives have to do with the impact of different personal characteristics and cognitive abilities on materiality-threshold judgments and decisions, then the appropriate experiment seems to be to manipulate or measure these personal characteristics directly and study their impact on materiality thresholds. Either materiality-threshold-related judgments or the threshold-estimate decisions could then be studied, depending on the aspect of the decision-making process upon which the researchers wished to concentrate.

As it stands, the authors have conducted an experiment on the impact of low and high client integrity on materiality-threshold estimates in seven European countries (with the United States as a benchmark). In doing so, they have assumed that personal and environmental characteristics measured in previous cross-cultural research generalize to auditors studied in the current experiment. Thus, the authors have effectively conducted a single experiment collapsing across the two lines of inquiry outlined above.

2. Theory and design

Of course, joint tests sometimes do suffice, but in the case of this study, they raise concerns on the validity of different cause–effect relationships. To understand these concerns, let us first begin with a summary of the design. The authors presented experienced auditors from different countries with a questionnaire in which these subjects had to make an estimate of how large an error in the inventory account needed to be before it was considered material (i.e., the smallest size to be material). The subjects were asked to make this materiality-threshold estimate after reading a short analysis of the client's integrity level as compared to the entire population of potential clients of the firm. The hypotheses (relating to the impact of culture on materiality-threshold judgments) were then tested essentially by running regression models with the materiality-threshold estimate as the dependent variable and the following three explanatory variables: (1) client integrity (2) uncertainty avoidance in the culture, and (3) litigation. The client integrity variable was manipulated at two levels: high or low. This was between subjects. That is, each subject got a questionnaire describing the client either as being of high integrity or as being of low integrity, and no subject was presented with both conditions sequentially. Uncertainty avoidance and litigation measures for the different countries were obtained from previous research or independent measurement. We discuss our concerns with these two variables in detail below.

Uncertainty avoidance was a variable measuring the average amount of “intolerance for uncertainty” of a certain people. The uncertainty avoidance scores for the seven different countries in this study were actually obtained by sampling employees of *one* multinational corporation by Hofstede (1980), a cultural psychologist, in a previous study. The reliability of Hofstede’s measure among populations not working in multinational corporations, and specifically among auditors, is an unstated and untested assumption. Hofstede’s measure seems to have been developed largely on the basis of three major questions asked of the subjects, two of which were “How long do you think you will continue to be working for this company?” and “How often do you feel nervous or tense?” The incorporation of these measures in the context of avoidance of uncertainty in the financial statements of a third (auditee) party is therefore an experimental design decision that needs support. We found the paper lacking convincing arguments providing such support.

Litigation (or the Litigation Index, as the authors called the variable interchangeably in the version of the paper available to us) was similarly measured from previous unrelated work. The construct that this variable represents seems to be the *exposure* to litigation or the *risk of doing business*, measured objectively. We are told that the measures were developed by *one* Big Six firm for their own business purposes. An insurance underwriter developed this “index” on behalf of the firm as a measure of the firm’s “risk of doing business as an auditor in a particular country.” Although all international audit firms’ experiences were reportedly incorporated in the measure, only publicly available claims and cost information were used. Thus, settlements of disputes not in the public record were reportedly omitted (Wingate, 1997, p. 140). This raises some concerns about the reliability of this measure from an *objective* standpoint. Further, the objective risk of doing business in a particular country is not necessarily the same as (or equal to) the *subjective perception* of the risk. Since environmental variables such as exposure to litigation are likely to influence materiality-threshold judgments only via the intermediary *perception* of risk, we are concerned with lack of evidence suggesting that the subjects indeed perceived the litigation risk in the same way as the objective reality of the risk. (This is without prejudice to our earlier-stated concern about whether the insurance underwriter did indeed measure the risk reliably.)

The authors report no elicitation procedures to measure the “uncertainty avoidance” and “perceived litigation risk” of the subjects, although these should have been easy to collect in postexperimental procedures. In fact, such postexperimental elicitation procedures are standard design features in experimental research. Our concerns over the reliability of the uncertainty avoidance and litigation measures were heightened by eyeball inspection of the distributions of these two variables. Fig. 1 in the authors’ paper shows, for example, that Pakistan and Thailand are clumped together with Germany and Taiwan in the same “uncertainty avoidance” category (at a median score of 65), while India (which can be argued to share a largely common sociocultural heritage with Pakistan for over 4000 years) was 25% of the scale away at an approximate score of 35. Similarly, anecdotal evidence argues against the classification of Japan, Belgium, Mexico, and Brazil as representing about the same amount of exposure to litigation risk. (Not all of these countries have been looked at in this study; however, these counterintuitive measures cast doubts on the generalizability of these measures.) This is not to suggest that these measures are necessarily incorrect. However, their

being appropriate in the context of the original measurement task does not automatically make them reliable for the authors' purpose. The authors use measurements from studies conducted on specific nonrandom subsets of the population. Since these studies have not been replicated and because anecdotal business–culture relationships could suggest other relationships, we are skeptical about the robustness of these measures.

In addition to the measurement of variables, we are concerned with the internal validity of the cause–effect relationships theorized in the paper. The authors hypothesize several relationships between cultural variables and the materiality-threshold estimates, but the auditors' cognitive processes that lead from one to the other remain in a black box. The use of empirical evidence from Wingate (1997) to argue that greater uncertainty avoidance would lead to higher materiality thresholds is unconvincing. What Wingate does report is *some* empirical evidence that a negative relationship exists between the amount of *required* accounting disclosure and the level of uncertainty avoidance. Even assuming that this finding turns out to be robust, the authors' theory that this somehow leads to an unambiguous prediction about materiality-threshold estimates is difficult to follow. One might argue that decreases in disclosure requirements leave less room for error. But does that mean that auditors worry about only the larger errors (i.e., higher materiality thresholds) or do they now need to be careful about even the smaller errors to ensure overall reliability of the financials (i.e., lower materiality thresholds)? Thus, the cognitive path from uncertainty avoidance to materiality-threshold estimates remains unclear and untested in the paper.

The link between litigation (or litigation risk) and the materiality-threshold estimates is more strongly argued, but equally confusing. The authors go through an extended discussion of how low-precision (i.e. higher materiality threshold) audits might lead to more litigation against auditors, and how auditors try to restrict the cost of additional audit work to the cost of litigation and somehow predict that “countries with higher litigation rates use higher materiality levels that result in less precise audits.” This argument seems tenuous at best, and the consistency of the results with the hypothesis does not, in our opinion, elevate the quality of the argument to the status of a theory. Moreover, it is important to reiterate that it is the *perception* of litigation exposure and not the objective exposure level that is the immediately relevant intermediate construct. (As will be discussed later, the counterintuitive results may well be due to this inappropriate identification of the relevant construct.)

The authors also examine differences between materiality-threshold estimates of auditors in the United States and those in Europe. The research hypothesis is one of no difference. The authors do not explain why any other possibility could be expected.

3. Analysis

It is not clear why the authors used two levels of client integrity if the research question is limited to whether uncertainty avoidance and litigation made a difference in materiality-threshold estimates. *Ceteris paribus*, the impact of client integrity in itself as a determinant of materiality thresholds is somewhat obvious. Thus, the real issue of interest seems to be that the impact of client integrity levels (independent variable) on the materiality-threshold

estimates (dependent variable) may differ based on the levels of the two other independent variables: uncertainty avoidance and litigation (or, more accurately in our opinion, perceived litigation risk). Thus, what the authors are trying to examine in addition to the main effects is perhaps a set of interaction effects, and an analysis of variance model (perhaps with the two continuous explanatory variables converted to categorical levels) seems ideally suited for the purpose. However, the authors run regression models with no specified interactions. Therefore, they tested only for main effects and not for any significant interactions.

The client integrity variable is statistically significant, although this tells us little more than that the client integrity manipulation worked. In addition, the uncertainty avoidance and litigation variables were also significant. Increases in uncertainty avoidance seem to predict increases in materiality-threshold estimates. This finding is consistent with the authors' stated hypothesis in this regard, but the lack of a clear theoretical development (as discussed earlier) together with lack of process data on the auditors' cognitive processes rules out an analysis of *why* and *how*.

The authors claim that the litigation variable was significant "as anticipated". That is, materiality-threshold estimates tend to increase with the litigation measure. We have already expressed our disagreement (in a previous paragraph) with this "anticipation." The key to these counterintuitive results lies perhaps in the fact that the relevant independent variable is the subjective *perceived* litigation risk, while the variable that the authors used was an objective measure.

The authors also report statistically significant differences in the materiality-threshold estimates between auditors in the US and several European countries. Since no difference was hypothesized, and since there is no theoretical discussion as to why a difference might have been expected, it is difficult to interpret the importance of these differences, collectively or separately.

4. What do we learn?

So what do we learn from this study? We are assured that auditors assign lower materiality thresholds to clients with lower integrity levels. It seems also that we learn that if countries are different in terms of the *Hofstede measure* of uncertainty avoidance, then there are some specific impacts on materiality-threshold estimates. We are not sure of the cognitive or psychological paths that lead to these effects, so we cannot say for sure how we could control or modify these effects. Also, we do not know the reliability of the Hofstede measure across different countries and different strata of auditors, so we cannot say whether it is uncertainty avoidance itself or some other correlated variable (e.g., risk tolerance or level of accounting regulation) that is the real driving factor. We also learn that an objective measure of litigation risk does not reliably predict the materiality threshold estimates, but we do not know whether a measure of perceived litigation risk might. We just did not have appropriate data collected in this study to reach a meaningful conclusion on this question.

In sum, this paper reminded us that cultural variables affect materiality-threshold decisions. It did not throw much light on the *how's* and *why's*. Future research in this area would be

productive if it could trace the path from key cultural variables of interest, through their impacts on risk preferences, incentive sensitivities, and other mediators, to the effects on assessments of audit risks and decisions on materiality thresholds.

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Pergamon

The International Journal of Accounting
36 (2001) 491–498

The
International
Journal of
Accounting

Reply to comments on “The association between European materiality estimates and client integrity, culture, and litigation”

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1. Motivation

1.1. Introduction

Our study examined how culture affects auditors' materiality estimates. Our discussants enumerate a list of factors that could affect an individual auditor's materiality estimates. While the differences suggested by our discussants would make an interesting study, they are not what this research examined. Although our sample includes 181 auditors from seven Western European countries, our focus was how the estimates from each country differed. The reason for using this methodology is that only the average materiality estimates of each country provide an insight into how cultural differences could influence the implementation of international accounting and auditing standards such as materiality. Our research is important because there is no research that indicates that the levels of audit precision are similar among countries.

1.2. Individual versus country estimates

We agree with our discussants on their point concerning individual testing of Uncertainty Avoidance and risk aversion. Another research design would have been to ask our participants to respond to Hofstede's questions that make up the Uncertainty Avoidance construct and an

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assessment of their risk aversion. Had we asked these individual questions, we could have compared their individual materiality estimates with their own uncertainty avoidance and aversion to risk. Had we done this, we could have studied both individual and group differences. This would have given us a data set of 181 rather than the 14 in this research (i.e., two average materiality estimates per country—one high integrity and one low integrity). The possibility of using individual testing provides an opportunity for future research.

1.3. Cognitive testing

With respect to cognitive testing, we began planning this study a year and a half prior to gathering the data. As part of this process, we discussed the possibility of using the Defining Issues Test (Rest, 1979), the Group Embedded Figures Test (Oltman, Raskin, & Witkin, 1971), and the Locus of Control Test (Rotter, 1966).¹ However, this type of testing would have dramatically increased the difficulty of obtaining our targeted sample of managers and partners. First, it takes between 45 and 50 min to administer these three tests (Bernardi, 1994). Second, direct supervision of the tests is essential to ensure that no problems occur. Additionally, the Group Embedded Figures Test is a timed test. Had we used cognitive testing, our research would have tied up a substantial number of an office's managers and partners for over 2 h to accomplish the tasks involved in this study. We were able to successfully market this research by presenting it as a stand-alone package that participants could work on during their slack time.

2. Theory and design

We also believe that the use of interactive terms would be appropriate as we indicated in the "Possible Interactions" section of the analysis and shown in Fig. 2 of our study. However, we did not have a sufficient number of data points because of our research design. As previously noted, had we asked each auditor to fill out Hofstede's questionnaire, we would have had 181 usable observations. Even with our current research design, interactive terms would have been possible had the firms from both France and Germany been in the sample.

2.1. Uncertainty avoidance

Collins and Bloom (1997) and Gray (1988) suggest that cultural values can influence the process that produces accounting values and systems. Salter and Niswander (1995) found that only Hofstede's construct of Uncertainty Avoidance associates with the accounting values they tested. Consequently, we do not believe that it is a significant "leap of faith" to assume that systems and values that are affected by cultural constructs will influence measures such as materiality. Using Jeurissen and van Luijk's (1998, p. 999) *scores of ethical business conduct*,

¹ These cognitive measures have been used extensively in audit judgment research.

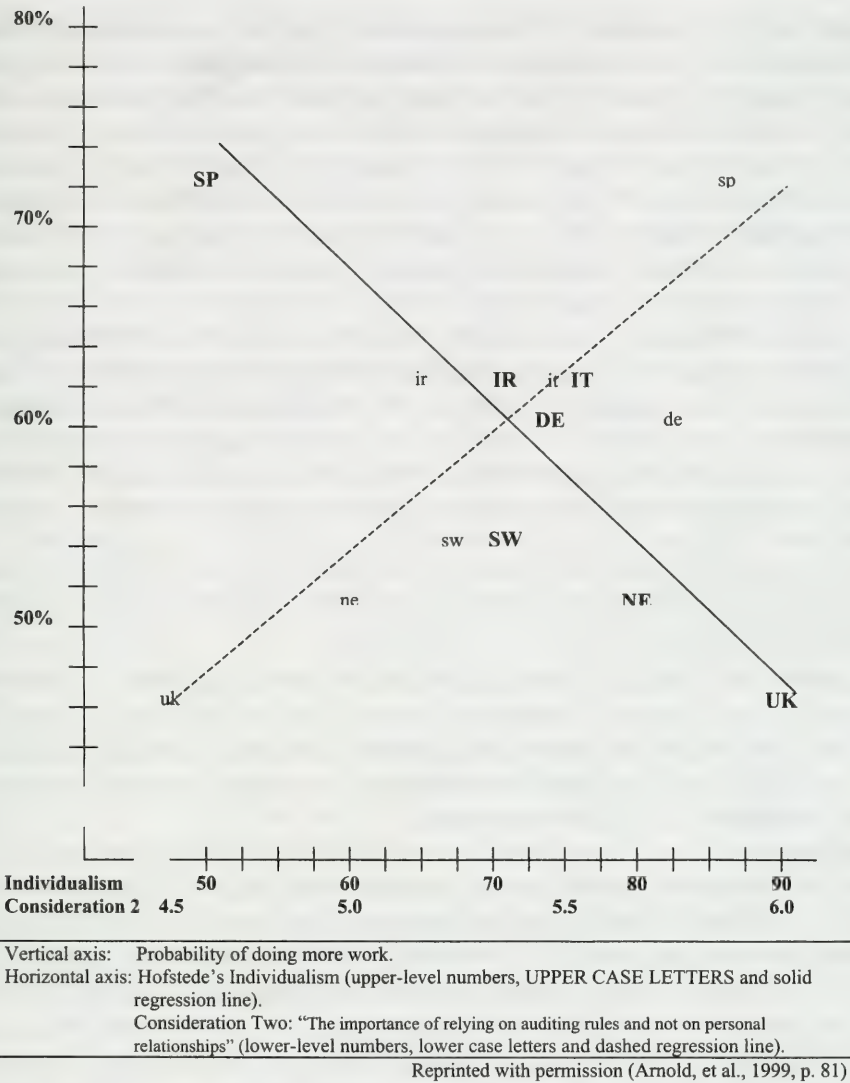


Fig.1. Probability of doing more work prior to signing-off for case 2 by individualism and consideration 2.

we find that, as Uncertainty Avoidance scores increase, perceptions of ethical business behavior decrease in Western Europe. Jeurissen and van Luijk's findings are supported by Husted (1999) who studies a sample of 44 countries throughout the world that are (1) part of Hofstede's (1980) sample and (2) are also part of international studies on corruption. Husted finds that, as Uncertainty Avoidance increases, perceptions of corruption also increase.

Arnold, Bernardi, and Neidermeyer (1999) found that Hofstede's Individualism construct negatively associates with a willingness to do additional audit work to address a possible audit problem. To test Hofstede's Individualism construct, Arnold et al. asked auditors to rate

their beliefs about the statement “The importance of relying on auditing rules and not on personal relationships” on a seven-point Likert scale. As shown in Fig. 1, the higher (lower) the concern for auditing rules in a given country, the more (less) likely that the auditors from that country would do the additional audit work. While the willingness of each country’s auditors to do the additional audit work is constant (i.e., the level on the vertical axis is the same), the average country response to the statement could vary from one (i.e., little concern for auditing rules) to seven (i.e., great concern for these rules). The fact that these responses plot out in a nearly perpendicular pattern to that of Individualism versus probability of doing more audit work is significant.

Trompenaars and Hampden-Turner’s (1998; hereafter referred to as THT) study on culture and its variables provide some insights into Hofstede’s variables. While many question the use of Hofstede’s data because it represent the responses of 100,000 IBM managers, managers make up 75% of THT’s (1993, pp. 1–2) sample and the other 25% are typists, stenographers, and secretaries. Arnold et al. (1999, p. 80) note that several of TNT’s variables significantly associate with the Uncertainty Avoidance scores of European countries.

Hofstede’s uncertainty avoidance construct is related to THT’s: “Whose fault was it” ($R^2=.24$, p. 57); “Acting as suits you even if nothing is achieved” ($R^2=.75$, p. 108); and “The reason for the organization” ($R^2=.65$, p. 173).

Consequently, the associations between Hofstede’s (1980) and THT’s (1998) constructs indicate that Hofstede’s data have been partially validated on a sample not working for a large multinational corporation. We also examined the associations among Hofstede’s cultural constructs and Au’s (1999) data for Western Europe. Our analysis indicates that Uncertainty Avoidance associates with Au’s pride in work.

Our discussants note that several of the countries appear to have questionable Uncertainty Avoidance scores. However, none of the countries they cited are included in this study (i.e., Pakistan, Thailand, Germany, and Taiwan). Had any of these countries been part of our sample, their concern would be valid. However, we failed to see the relevance to a study based solely in Western Europe. Our discussants would have us believed that India and Pakistan are two countries that are only separated by some arbitrary line on a map. While India and Pakistan may have shared a *common sociocultural heritage*, a significant split occurred when different religions were introduced into the region. Religious differences led to conflicts throughout the intervening years extending to current nuclear threats. Pakistan has only been part of India for a total of 711 years during three periods from 3000 B.C. to today. Conversely, Pakistan ruled major portions of northern India for 380 years during the same 5000-year period. (Abdullah, 2001). Until 1947, India and Pakistan were under British influence. A comprehensive study of Hofstede (1980, p. 12) shows that they would not be candidates for cultural research given their association with Britain.

2.2. *Litigation*

Again, we find it curious that our discussants focus on countries that were not included in the sample to make their point on litigation risk (i.e., Japan, Belgium, Mexico, and Brazil).

Our discussants refer to anecdotal evidence twice in their discussion without any specifics concerning the evidence or the source of their data. This information would have allowed us to evaluate the impact of these pieces of anecdotal evidence on our findings.

Our discussants are skeptical about the use of the litigation variable because it has not been validated by additional research. However, we were not the only authors at the conference who used this litigation index. In addition to using the litigation index, Fargher, Taylor, and Simon (in press) also used the same disclosure index that Wingates (1997) used. Fargher et al.'s research found that these indices were significant for a sample of 20 countries of which three were part of our sample. These authors found that, as the number of financial statement disclosures increased, the probability of having a BigSix auditor also increased. They also found that audit fees increased as the number of financial statement disclosures ($P=.0002$) and litigation ($P=.0001$) within a country increased.

Our discussants claim that, because out-of-court settlements are not included in the computation of the litigation, the index is of questionable value. While it is true that the magnitude (i.e., dollar value of the settlement) is not included in the litigation index by virtue of the fact that these types of settlements are closed, the original filing of the lawsuit is included in the calculation of the index. One could also argue that certain types of claims are settled out of court as a matter of company policy and that the level of these out-of-court settlements should also be a function of the level of litigation in the country. If out-of-court settlements are proportional to the level of litigation in a country, then out-of-court settlements should not significantly affect the litigation index as our discussants maintain.

Finally, our prediction for the litigation index was based on the statement that *One might expect that lower precision audit (i.e., higher materiality) has a higher likelihood of failure and litigation than a more precise audit (i.e., lower materiality)*. This statement was the lead sentence to the paragraph that described our logic pattern. Our argument is that, given a choice of setting materiality at a lower or higher value, the lower the materiality (i.e., the finer the filter), the less likely an error will escape detection. Since auditors do not disclose the materiality level, they used on a specific audit, then litigation is based on what a prudent person would assume auditors should have used (Harper & Fleming, 1956).

3. Analysis

3.1. Client integrity

Client integrity manipulations have a scattered history of success in research. For instance, audit seniors who are told the evaluation of their client's integrity is low should detect a material error at a higher rate than other seniors not given this insight. While this might appear to be "somewhat obvious," Bernardi (1994) found that seniors who received this client rating did not detect the embedded error at a higher rate. In fact, seniors who made the wrong decision (i.e., the account was fairly stated) for the low-integrity client did not have higher probability of fraud estimates even when given a series of cues that the auditing standards in effect at the time indicated (should increase) the probability of fraud (Bernardi, 1997).

Our discussants question the use of the client integrity variable. However, we found only one study (Bernardi & Arnold, 1994) that demonstrates that auditors follow the guidelines set forth in auditing standards as they relate to materiality and client integrity. However, Bernardi and Arnold's research uses a sample of auditors from the United States and did not ask an open-ended question on materiality. Since research incrementally extends the knowledge base, we took an established case study and used it in a European audit environment being careful to correct the limitations of the previous study. Replication studies are difficult to justify because they are perceived as "adding little to the knowledge base." Consequently, including a variable such as client integrity along with new variables makes the replication a viable research option. The use of the integrity manipulation provided us with (1) a check of whether the participants took the study seriously (i.e., did not randomly answer the questionnaire) and (2) one additional data point for each country (i.e., $n = 14$ rather than 7).

4. What did we actually learn?

Finally, what did we actually learn from this research? To answer this question, we assume that the United States wishes to accept the results of audits done by European auditors (i.e., mutual recognition). Consequently, we believe that the provisions in Auditing Standard No. 82 *Consideration of Fraud in Financial Statements* (American Institute of Certified Public Accountants (AICPA), 1997, p. 37) provide an insight into the findings of this research:

Materiality levels include an overall level for each statement; however, because the statements are interrelated, and for reasons of efficiency, the auditor ordinarily considers materiality for planning purposes in terms of the smallest aggregate level of misstatements that could be considered material to any one of the financial statements. For example, if the auditor believes that misstatements aggregating approximately US\$100,000 would have a material effect on income but that such misstatements would have to aggregate approximately US\$200,000 to materially affect financial position, it would not be appropriate for him or her to design audit procedures that would be expected to detect misstatements only if they aggregate approximately US\$200,000.

Because *it would not be appropriate for him or her to design audit procedures that would be expected to detect misstatements* using a higher materiality estimate, how does one explain the difference in the average materiality estimates? This is an especially difficult question since we provided the same data to all of the participants with respect to financial statement data. Therefore, there should have been little or no difference in the average materiality estimates among countries unless culture influenced the auditors' cognitive process.

It appears that countries with higher Uncertainty Avoidance scores are willing to be less precise in their procedures when they believe the risk is not high (e.g., for a high-integrity client). This follows and explains our finding that Hofstede's Uncertainty Avoidance explained about 41% of the variation in the average materiality estimates for the high-integrity client in a univariate analysis. However, this willingness to accept uncertainty did not apply to the

estimates for the low-integrity client. Overall, the average estimates suggest a degree of precaution (Harper & Fleming, 1956). These average estimates reflect both the low-integrity rating and the level of litigation in the various countries. The litigation index explained about 65% of the variation in the average materiality estimates for the low-integrity client in a second univariate analysis. Consequently, we learned that, even if Europe had a common set of auditing standards, culture could influence the application of these auditing standards.

Acknowledgments

We wish to thank our discussants Ananda Ganguly and Cynthia Turner for their comments and suggestions on our study. In responding to their comments, we will follow the sequence they used: (1) motivation, (2) theory and design, (3) analysis, and (4) “what do we learn.” In this reply, we introduce research by Au (1999), Husted (1999), and Jeurissen and van Luijk (1998) that was not cited in our original research. The second author became aware of these studies while teaching a course in business ethics during the spring semester of 2001 (i.e., after the paper was accepted for publication). We believe that this additional research addresses our discussants’ concern about the strength of our argument that there is an association between Hofstede’s (1980) Uncertainty Avoidance construct and materiality.

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Book Review Section

The book review section is interested in works published in any language, as long as they are comparative or international in character. The author or publisher of such works should furnish the book review editor with two (2) copies of the work, including information about its price and the address where readers may write for copies. Reviews will be assigned by the book review editor. No unsolicited reviews will be accepted. Suggestions of works that might be reviewed are welcomed.

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Pergamon

The International Journal of Accounting
36 (2001) 501–503

The
International
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Book review

Intangibles: Management, Measurement, and Reporting

by Baruch Lev, Washington, DC, Brookings Institution Press, 2001, pp. viii+216

The intangibles of the modern business — intellectual property and knowledge assets, brands, alliances, human and organizational capital — are frequently its most valuable assets. There is evidence of the growing importance of intangibles in the soaring price-to-book ratio, which has risen almost without interruption from its nadir of below one in the 1970s to in excess of six by early 2000. So long as you believe that stocks are sensibly valued, and assuming the economy is not getting less competitive, the price-to-book ratio reflects the proportion of off-balance sheet (essentially intangible) assets to on-balance sheet (essentially tangible) assets in the economy.

Baruch Lev is perhaps the leading accounting academic who is writing and researching on intangibles. In this timely monograph, Lev explains what we mean by intangibles, presents some explanations for their growing importance in the modern economy, and tackles the difficult question of how intangibles should be accounted for.

Intangibles are clearly not a new phenomenon — the 19th century had plenty of brands, patents, human capital. So why now? Lev attributes the growth in importance of intangibles since the 1980s to two factors: the greatly intensified competitive environment that has followed deregulation and globalization, and the facilitation provided by information technology.

Corporations have now largely exhausted the potential for manufacturing economies of scale, and excellence in manufacturing has been widely mimicked. So production has become commoditized. Increasingly, the corporation must look to innovation rather than manufacturing for competitive advantage. Lev describes how companies such as Ford are busy “deverticalizing” and pushing manufacturing and the ownership of manufacturing assets out to third parties (pp. 10–14). Intensive use of IT permits Ford to manage these new relationships efficiently. Of course, this leaves a nagging question in the mind of someone still trying to figure out why the price-to-book has risen *quite* so high. Where are these manufacturing assets going?

Lev notes the value-creating potential of the scalability of many intangibles — unlike tangibles or financial assets, the use of an intangible at one place or time does not preclude its use elsewhere — and of network effects: “. . . network effects are a hallmark of advanced technology, information-based industries . . . [and] are increasingly characterized by product-related intangibles (unique products and services protected by intellectual property) at the core and alliance-related intangibles at the periphery” (p. 31). The downside is that

investments in intangibles are often far more risky than investments in tangibles, partly because of the very winner-take-all nature of network economics. Also, intangibles are bedeviled by fuzzy property rights and the difficulty of excluding outsiders from enjoyment of the intangibles.

People are clearly the key to innovation, and CEOs unceasingly remind us that its people are the corporation's most important asset. However, "human capital" raises in stark form a central difficulty of the intangibles economy. Employees are making it increasingly clear that they are not, in any meaningful sense, assets. They can walk. Lev quotes a striking finding: that over 70% of young, fast-growing companies were created by people simply replicating or developing innovations from their previous employer (p. 35). In such a world it remains an open question how much of the value created by the new economy will be left with stockholders in public markets, and how much will be captured by key employees.

The growth of intangibles has exposed the limitations of the existing accounting model. The question that is constantly asked by the innocent nonaccountant is: if intangibles are so important, why aren't they on the balance sheet? This debate surfaced energetically over a decade ago when a small number of leading branded goods firms in the UK and elsewhere started to include a valuation of their brand equity in the balance sheet. The practice did not become widespread, and recent accounting standards reflect the current consensus, which is that internally generated intangibles cannot be usefully included in the balance sheet.

Intangibles do not meet accountants' tests for balance sheet recognition for several reasons. Intangibles are frequently diffuse in nature and not readily separable from other assets or from the business as a whole. The fuzzy property rights surrounding many intangibles mean that the company may not exercise the "effective control" required of an asset. The paradox is that it is the uniqueness of its intangibles that enables the firm to differentiate itself and helps it to sustain competitive advantage. But, being unique, there is no active secondary market in similar assets to which accountants can refer to get a market price. So the valuation of intangibles necessarily involves subjective evaluations of future cash flows.

The debate about whether the firm should value its intangibles in the balance sheet is over. The new challenge is disclosure. At present, firms have very little guidance on what information they should usefully disclose to enable outsiders to evaluate their intangibles.

Throughout the book, Lev associates the creation of intangibles with the process of innovation, and the "innovation value chain" provides the framework for Lev's template for a new set of corporate disclosures (Chapter 5). Lev proposes a detailed series of disclosures under three broad headings: learning activities and the discovery of new ideas, implementation, and commercialization. His proposals jibe with those of other writers who have been calling for systematic disclosure of the way in which management targets and measures the creation of shareholder value. A key element in this work will be the increasing alignment of internal and external reporting.

There is a long way to go in developing an accounting model for the world of intangibles. While templates such as Lev's are well articulated, there is a lot of research still needed before we can define a parsimonious and robust set of metrics for, say, brand equity or human capital. Observation of companies' current *internal* reporting systems suggests that they are using a wide variety of metrics to measure the performance of these assets. If the appropriate metrics

for intangibles is quite context-specific, it will be challenging to develop accounting rules that bring forth more useful disclosure. The supply of information on intangibles will need to be matched by demand. At present, both supply and demand are very weak. Unless equity analysts and other outsiders can use the data that companies are producing, attempts to improve disclosure will be frustrated. It is going to be fascinating to watch the debate proceed.

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The International Journal of Accounting
36 (2001) 505–508

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Book review

Guide to International Standards on Auditing & Related Services, 2001 (includes Practice Aids and CPE)

by Dan M. Guy and D.R. Carmichael, Fort Worth, Texas, Practitioners Publishing Company, September 2000, second edition, paginated by section.

Global standard setting in auditing has truly come of age, and this *Guide* by Dan Guy and Doug Carmichael, two respected authorities in auditing, is a very welcome addition to the professional literature available to practitioners, academics, and students. As stated in the preface, “This technical reference *Guide* presents the International Federation of Accountants’ (IFAC) International Standards on Auditing (ISAs), International Standard on Assurance Engagements (ISAE), and IFAC’s *Code of Ethics for Professional Accountants (Code)* in an easy-to-read, active-voice format. The *Guide* is designed to help auditors, accountants, and financial executives across the world community understand, comply with, and apply ISAs to audit and related services (review, agreed-upon procedure, and compilation) engagements and the ISAE to assurance engagements. The *Guide* will also facilitate comparison of IFAC’s *Code* with the ethical requirements in individual countries” (p. vii). To a large extent, the stated objectives of this *Guide* are achieved, and, being the only such comprehensive work of which I am aware, the effort expended on producing such a resource is commendable and noteworthy.

In the remainder of this book review, I will first summarize the significant contributions made by this *Guide* to the professional literature. I will then observe that the pace and complexity of global standard-setting efforts in auditing has increased considerably; the landscape has altered even in the short time since this *Guide* was written. Consequently, there are several additional perspectives that the authors should consider when preparing future editions of this work to make it even more relevant for international auditing practitioners.

At the outset, I should reiterate that this *Guide* is unique simply by virtue of the fact that it is probably the only such comprehensive resource on the ISAs promulgated by the International Auditing Practices Committee (IAPC). It follows the sequence of IFAC’s *Technical Pronouncements Handbook*, and each pronouncement is presented in a separate section. The sections are logically presented and contain the following parts: Introduction, Definitions, Basic Principles and Essential Procedures, Public Sector Perspective, Explanations and Illustrations (including, if applicable, small entity considerations), and Practice Aids. Helpful interpretations of the *Code* (now being substantially revised — see comments below) as well as a *Glossary* are also presented. The readily comprehensible and direct

writing style of the authors will be found appealing by the busy practitioner, and it will prove particularly important when preparing the planned Spanish edition of this work. Overall, I am very pleased that we finally have a well-written *Guide* to accompany the ISAs, which will likely become a trusted and reliable resource for practitioners, academics, and students. The Practice Aids and self-study CPE sections are additional desirable features of the *Guide*.

I now turn to a few significant perspectives that the authors should consider incorporating in future editions of the *Guide*. These suggestions should not be construed as criticisms; rather, they are meant to enhance the *Guide*'s relevance and usefulness to practitioners, academics, and students.

In the wake of the Asian economic and financial crisis, given IFAC's role with respect to the development of international auditing, ethical, and quality assurance standards, the International Forum on Accountancy Development (IFAD) was established with the explicit goal of raising the quality of financial reporting and auditing worldwide. This is a formidable challenge, requiring the cooperation of many, and will take time, as described in the context of accounting standards by Nobes (2000, p. 3): "Convergence of accounting standards will not be achieved without substantial co-operation between government, the business community and the accountancy profession. Improvements in accounting practice will also require the development of educational, professional and regulatory infrastructures. Adoption of new standards without adequate preparation may be more detrimental than beneficial." These remarks are even more relevant to the convergence of auditing standards that are sometimes enshrined in country-specific statutes, laws, and regulations.

There is recognition that, as the auditing profession evolves over time, there may come into being a *standards-gap* (public expectations that go beyond existing auditing and accounting standards), a *performance-gap* (public perceptions that auditing performance falls short of what is required by existing standards), and a *communications-gap* (inadequate communication of the role and responsibility of the auditing profession in managing public expectations). As noted by Canada's Macdonald Commission (1988), these "gaps" may individually or collectively create or exacerbate the "expectations gap," referring to the public's expectations of audits and the public's perception of what audits actually provide. Accordingly, the Big Five accounting firms and other international firms have worked hard to rethink as well as enhance the infrastructure of global standard setting in auditing (partly through an IFAC-contemplated restructuring of the IAPC), to assist with a project involving substantial revision of the *Code* (an exposure draft of the *Code* is currently under consideration), and to support the formation of the Transnational Auditors Committee (TAC) to raise audit quality worldwide. These significant changes in the global infrastructure and standard-setting apparatus, including the contemplated revision of the *Code*, deserve a prefatory discussion in the *Guide* to provide the reader with useful background. Otherwise, the reader may never fully appreciate the context in which global standard setting in auditing is occurring.

Unlike the domain of accounting standards where the International Organization of Securities Commissions (IOSCO) has endorsed a core set of International Accounting

Standards (IASs), at the time of this writing, IOSCO has not yet similarly endorsed ISAs. Nevertheless, just as a worldwide duopoly currently exists with respect to generally accepted accounting principles (GAAP), viz., US GAAP and IASs, we have a parallel situation in the domain of generally accepted auditing standards (GAAS), viz., US GAAS and ISAs. Consequently, there is an unmet need for a detailed comparison between US GAAS and ISAs (similar to what appears as Appendix B in the American Institute of Certified Public Accountants' Codification (2001); but this comparison was completed as of 1998, and it needs to be made a "two-way" comparison and updated).

A similar consideration would extend to independence/ethics issues, so that a concise summary of the substantially revised *Code*, when available, would facilitate comparison with the numerous national ethics/independence-related rules and regulations around the world. Perhaps the authors could consider doing such a comparison for auditing standards as they appear in US GAAS and ISAs and continue to furnish a concise summary and interpretation of the revised *Code*. These materials could be invaluable if presented as an Appendix in a future edition of this *Guide*, although that may substantially increase the scope of the authors' work and require additional volumes.

Despite the promise to continuously update the *Guide* online at www.ppcnet.com (updates planned within 30 days after the publication of a new standard), I must point out that the second edition (as of September 2000) of the *Guide* is already out of date, considering that a revised ISA 240: *The Auditor's Responsibility to Consider Fraud and Error in an Audit of Financial Statements*, International Auditing Practices Statement (IAPS) 1012: *Auditing Derivative Financial Instruments* have been issued. Furthermore, as noted above, a significant revision of the *Code* is in process. The reason for excluding IAPSs from the *Guide's* coverage is rather surprising and is not clear to me. Fraud and derivatives auditing pose significant contemporary international auditing practice issues, and, hence, their omission from the book-format of the current version of the *Guide* is regrettable. In retrospect, it appears that a loose-leaf version of the *Guide* with the ability to accommodate such new releases, in addition to the abovementioned online resource, would have been more appropriate. Of course, the existence of the Web-based, online resource does substantially alleviate the problem of continuous updates.

In conclusion, I would encourage audit practitioners to become conversant with ISAs by using this helpful *Guide*, and, perhaps, by completing the self-study portions to deepen their understanding while gaining CPE credit. I would like to add that university academicians, who teach undergraduate and graduate auditing, should seriously consider using this *Guide* as a supplement to existing courses on auditing. With international auditing harmonization efforts under way, global standard setting in auditing has picked up momentum, and practitioners, professors, and students must keep abreast of contemporary developments. There could be no better way to gain familiarity with international standards than by referring to this *Guide* when studying the contents of ISAs and IFAC's *Code of Ethics for Professional Accountants*.

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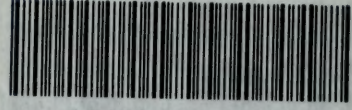
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