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VOLUME 7

ACCOUNTING, BANKING AND CORPORATE FINANCIAL MANAGEMENT IN EMERGING ECONOMIES

VICTOR MURINDE
Editor

ACCOUNTING, BANKING AND CORPORATE FINANCIAL MANAGEMENT IN EMERGING ECONOMIES

RESEARCH IN ACCOUNTING IN EMERGING ECONOMIES

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EDITED BY

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DEDICATION

To Rosemary I. Wallace, who gave generously of her expertise and precious time in copy-editing previous volumes of this research annual.

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ABOUT THE GUEST EDITOR

Victor Murinde is Professor of Development Finance as well as Director of the Corporate Finance Research Group in the Birmingham Business School at the University of Birmingham. He completed his PhD in financial and macroeconomic modelling at Cardiff Business School, University of Wales Cardiff, in 1990. Thereafter, he held academic positions as Lecturer in Banking at Cardiff Business School, Senior Lecturer in Finance at the University of Birmingham, Reader in Development Finance, and was promoted to a personal chair, as Professor of Development Finance, in July 1999. He was awarded the *Doctoris Honoris Causa* by Tallinn Technical University on 17 September 2003; the dictum on the award reads: "in recognition of your merits in Financial Economics and Banking and promotion of British-Estonian collaboration in research and graduate education".

During the academic year 2001–2002, he held the distinguished Hallsworth Senior Research Fellowship at the Institute for Development Policy and Management, University of Manchester, on sabbatical from the University of Birmingham. Currently, he holds external appointments as Visiting Professor at Cardiff Business School, and Professor Extraordinary at the University of Stellenbosch Business School. He is a resource person for research projects as well as a contributor to the Collaborative PhD Programme (in Financial Economics) for the African Economic Research Consortium (AERC).

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INTRODUCTION: ACCOUNTING, BANKING AND CORPORATE FINANCIAL MANAGEMENT IN EMERGING ECONOMIES

Victor Murinde

1. INTRODUCTION

Singular among the inextricable links between accounting, banking and corporate financial management is that the theory and practice of accounting generate the main information sets that are used in banking and corporate financial management. Accounting theory provides a framework for underpinning the financial operations of banks and companies. As a discipline, accounting also underpins the data generation process for book values of assets and transactions, which are used alongside values derived from market transactions to provide the necessary database upon which bank management decisions and corporate operations are forged. In addition, most secondary data that are often used in empirical and applied research on firms and banks are partly generated from accounting-based information sets. At the economy-wide level, the national income accounting framework, based on the Standard of National Accounts, is used to underpin the flow of funds between the main sectors of the economy, including the household sector, the company (business) sector, the banks

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sector, the government sector and the foreign sector; see the theory and applications in Green and Murinde (2003). In the flow of funds context, the role of finance in economic development is crucial, as can be witnessed from the increasing research attention and policy debate in the last two decades (see, for example, the survey of research on financial and development in Green, Kirkpatrick, & Murinde, 2005).

However, emerging economies have limited opportunities of influencing the agenda on international accounting standard-setting. It is not surprising that, in most emerging economies, the accounting conventions and standards that are required to implement accounting theory and frameworks are often not fully developed to effectively foster the link between accounting, banking and corporate financial management. The link is sometimes severed by the prevalence of asymmetric information and market imperfections in these economies. In general, the dilemma is that emerging economies find themselves caught between the rock and the hard place. The set of accounting regulations and standards do not necessarily reflect the prevalence of micro and small enterprises that dominate the rudimentary corporate sector, nor do the accounting and tax codes as well as the banking capital adequacy regulations reflect the fact the majority of operations in rural settings are microfinance institutions rather than fully fledged commercial banks. Thus, an integral element of research in the areas of accounting, banking and corporate finance in emerging economies is to investigate and identify these links, especially the nature of the data-generating process, the development of theories to underpin the financial and economic structure, and the policy and practitioner-oriented issues in these economies.

This volume presents research papers, which seek to contribute to the challenge of evolving theoretical frameworks, generating empirical studies and informing policy initiatives, in the light of the realities in the financial sectors of emerging economies. The papers adopt diverse methodologies, ranging from purely theoretical studies to empirical work and case studies. The papers are also thematically linked such that they cover the three main themes of accounting, banking and microfinance, and corporate financial management.

In what follows, the remainder of this introductory chapter is structured into three sections.

2. ACCOUNTING AND FINANCIAL REPORTING

The evolution of accounting and financial reporting in emerging economies has been heavily influenced by historical events that bind national and international economic development. Shahrokh Saudagaran and Joselito Diga analyse the development of modern accounting institutions during the post-colonial period of five member countries of the Association of South East Asian Nations (ASEAN). They identify the main national and international factors that have influenced the development of accounting in ASEAN. In general, it is shown that accounting systems inherited from the colonial era have been reproduced and maintained in the post-colonial era.

In addition to the historical influences, the evolution of accounting in emerging economies has been shaped by national and international developments in setting accounting standards. Nadine Fry and Roy Chandler show that many emerging economies have either adopted International Accounting Standards (IASs) or used the IASs as a base from which to develop their domestic standards. They undertake a comprehensive survey of senior executives and finance directors in emerging economies and find wide acceptability of the former International Accounting Standards Committee and its output, the IASs.

However, in transition economies, departure from historical developments has been necessary to establish the basis for accounting and financial sector reform. Marek Schroeder proposes the use of the incidence of negative and positive goodwill on consolidation as an accounting indicator of progress in transition from a command to a market economy. The study focuses on Poland, using a sample of Polish listed firms for the period 1995–2001. Poland is an interesting case study because the political and macroeconomic indicators show successful financial reforms and rapid progress to a market economy, including membership of the European Union. It is therefore interesting to note that the study is a bit cautious about the progress made in accounting, notwithstanding the rapid progress on financial reforms.

An important point in understanding the historical legacies as well as the setting of accounting standards is that accounting information may provide powerful insight into the intricacies of business operations. Ku Ismail and Roy Chandler examine quarterly financial reporting systems in Malaysia and find that although there is general support for frequent financial reporting, users would prefer to see more detailed disclosure, shorter delays and more auditor involvement in the publication of quarterly reports. In addition, accounting information may be useful for banks and financial institutions that employ the information in lending as well as regulatory functions. Shahzad Uddin and Mohammad Khan report on the role of accounting information in lending models used by lending companies for small firms in emerging economies. It is found that accounting information is crucial for operationalising formal lending models, although personal relationships, political interventions, the culture of cronyism and other complex sociopolitical and socioeconomic factors also tend to play an important role in lending decisions. The problem is that these contextual factors may crowd out the role of accounting information if the regulatory environment is weak and corporate mandatory disclosure is not enforced. Samuel Sejjaaka studies corporate mandatory disclosure in the financial sector in Uganda, focusing on banks and insurance companies. It is found that the overall level of disclosure in the financial sector in Uganda is extremely poor regardless of auditor type and this may be related to a weak regulatory environment. Under such an environment, the usefulness of accounting information may be limited, irrespective of the historical developments and absence of accounting standards.

3. BANKING AND MICROFINANCE LENDING

Banking is an important sector in emerging economies, especially for private sector development in general and corporate sector growth in particular, given the low levels of capital market development. However, banks in emerging economies are highly vulnerable to external shocks, mainly financial crises.

To deal with external shocks as well as managerial failure, regulators in these economies have increased their focus on the capital adequacy of banking institutions, since the 1988 Basle Accord. Hadeel Yaseen and Andy Mullineux look into bank regulatory issues by investigating the impact of capital regulation on bank behaviour in Jordan during 1980–2002. It is found that capital requirements significantly affected banks' capital ratio decisions and that regulatory pressure did not induce banks to increase their capital, but it did positively affect their chosen risk level. This finding suggests that Jordanian banks constrained by the capital adequacy requirements increase both capital and risk to keep their risk-adjusted capital ratio from falling below the minimum whilst maintaining their profitability.

Although they may be able to influence bank behaviour in some cases, bank regulators face difficult decisions when dealing with distressed banks or in the course of intervention and resolution of failed banks in emerging economies. Martin Brownbridge examines the problems faced by the bank regulator in Uganda in tackling bank distress in 1998 and 1999, when four private sector banks and a large partly government owned bank failed. It is shown that the choices open to the regulator were threefold: to attempt some form of open bank resolution, to place distressed banks under statutory management, and to secure a sustainable resolution for a bank considered 'too big to fail'. Nevertheless, the optimality of any of these decisions is a matter for further investigation.

In addition to an enabling regulatory environment, banks have to maintain adequate capital investment into information technology (IT) and related innovations. Ahmad Mashal investigates the effect of IT investment on productivity and profitability of the leading Jordanian bank, the Arab Bank, during 1985–2004. Some quite substantial returns to investment in IT capital are found, which may serve as an incentive for bank mangers to shift emphasis in IT investment from labour to capital.

However, banking reforms in most emerging economies tend to go beyond innovations in IT and the regulatory environment, by focusing on, for example, the efficiency of the intermediation role of banks. Thomas Bwire and Caleb Tamwesigire investigate the response of savings to financial sector liberalisation in Uganda during the period 1971–2000 using a generic savings model. The findings suggest that financial liberalisation must be supplemented with other policies aimed at removing some structural bottlenecks that characterise Uganda's financial system, which has great relevance for the formulation and conduct of monetary policy.

The demand counterpart of savings behaviour relates to the question of access to credit, especially in terms of the welfare effects and the implications for land and banking sector reform. Patrick Ryan notes that despite the apparent recent success of microfinance institutions in emerging economies, certain categories of MSE are still unable to gain adequate access to credit. The main problem, at least in the context of the case study of microenterprises in Uganda, is that the financial product design is inappropriate for certain categories of enterprises that have complex liquidity problems. Manh Quach and Andrew Mullineux take this issue further by investigating the determinants of household borrowing from the formal financial sector, the determinants of credit rationing by the formal sector and the impact of credit on household welfare in rural Vietnam. It is found that education, savings, the area devoted to farming and the availability of formal credit are important determinants of both household borrowing and credit rationing by the formal sector. It is also found that credit has a positive (albeit small) effect on household welfare in rural Vietnam. The findings support the case for land and banking sector reform in Vietnam, with lessons for emerging economies.

Nevertheless, it is not altogether clear to what extent the corpus of knowledge gained through research on the formal commercial banks in emerging economies can be applied to a large segment of the informal financial sector, including the microfinance sector and the financing of micro and small enterprises (MSE), which form the backbone of corporate activity in these economies. Tidings Ndhlovu and Emmanuel Cleeve look at the MSE sector from a macroeconomic perspective, aiming to examine the extent to which the sector expands or contracts. Among the findings of interest is that MSE development is linked primarily to long-run structural processes, such as urbanisation and commercialisation in the rural areas, rather than short-run cycles and policies.

The microfinance sector in emerging economies seems to run counter to bank intermediation theory and practice and tends to rely on social capital, including the formation of homogenous groups and risk sharing. Robert Lensink and Habteab Mehrteab study the risk behaviour and group formation of micro credit groups in Eritrea. However, they find that the groups are formed heterogeneously and generally conclude that credit groups in Eritrea do not seem to consist of borrowers of similar risk types.

4. CORPORATE FINANCING AND FINANCIAL MARKETS

The important question of corporate financing was raised by Myers (1984, p. 1) when he asked, "How do firms choose their capital structures?", and answered, "We don't know". While new research has continued to shed light on the capital structure puzzle in industrial economies, there is limited evidence on this issue in emerging economies. Tomoe Moore and Christopher Green provide new evidence in this area by studying the portfolio behaviour of Indian non-financial corporations within a balance sheet framework. It is found that, in general, policy variables have a relatively strong impact on firms' capital structure decisions; moreover, financial liberalisation is found to be a contributory factor to widening financing opportunities for firms.

Firms' investment and financing decisions are influenced by their cash flows, including receivables and payables. Sebhatleab Tewolde and Henk von Eije study the optimisation of trade credit by manufacturing firms in Eritrea. It is found that firms benefit from co-operation with customers and suppliers to overcome cash flow problems and reduce market imperfections.

In addition, Sanjiva Prasad, Christopher Green and Victor Murinde examine the financial structure of Malay and Thai non-financial companies by using three datasets: historic cost accounts. last-in-first-out (LIFO) inflation-adjusted accounts, and first-in-first-out (FIFO) inflation-adjusted accounts. The evidence generally supports the pecking order hypothesis; specifically, it is found that a relatively high proportion of asset growth is internally financed in both Malaysia and Thailand, mainly through retentions. The evidence also suggests that while unprofitable firms in both countries tend to be over-geared, the risk of bankruptcy has a non-linear influence on leverage.

The risk of bankruptcy is often signalled by increasing levels of financial distress; as such, it is important for firms to devise 'early warning models', which are able to generate predictions of financial distress. Yusuf Karbhari and Zulkarnain Sori propose and implement a model that predicts corporate financial distress and potential failure of Malaysian firms after the Asian financial crisis of 1997. It is interesting to note that the model successfully predicts corporate financial distress at the rate of 88 percent.

In general, however, corporate financing and corporate financial management in emerging economies are partly influenced by the state of stock market development in these economies. Stock markets play important roles in corporate finance, including raising new finance, ensuring market discipline and level playing field for investors, and determining the cost of capital for listed as well as unlisted firms. For emerging markets, an important research approach is to link firm financing issues with stock market development. Chipo Mlambo and Nicholas Biekpe investigate the relationship between stock returns and beta, size and the price-earnings (P/E) ratio for eight African stock markets for the period 1997–2002. The size effect is observed only for Mauritius and Zimbabwe, whereas the P/E effect is found for Egypt, Kenya and Morocco. In addition, Daryl Collins takes up the cost of capital issue and seeks to empirically establish the most appropriate method for calculating the cost of equity for markets in different stages of development and global integration, including developed markets, emerging markets, and the smallest and least developed frontier markets. It is found that while CAPM is not appropriate for any market, either emerging or developed, downside risk measures may be a more appropriate method for calculating the cost of equity across all the markets.

5. CONCLUSION

The main contribution of this volume to existing research on emerging economies is that it offers research papers that directly address the challenge of pushing the theoretical and empirical frontiers of knowledge in accounting and financial reporting, banking and microfinance transactions, and corporate financial management and financial markets. In addition to the advances in theoretical and empirical work, the papers offer interesting insight into policy dilemmas, sometimes with some recommendations on the way forward.

I hope the reader will find the papers interesting and resourceful in the three areas of theory, evidence and policy, perhaps not by the same weight or coefficient.

I am greatly indebted to the contributing authors for making available to *Research in Accounting in Emerging Economies* their original and previously unpublished papers. The referees, who are listed in the prelims of this volume, did excellent work in providing useful comments, safeguarding the high quality of the journal and turning around the papers in short time. In general, the editorial work was made particularly easy by the cooperation of the authors in revising their provisionally accepted drafts as well as proofreading the galleys.

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THEME 1:
ACCOUNTING AND FINANCIAL REPORTING

GOODWILL ON CONSOLIDATION AS AN INDICATOR OF PROGRESS IN TRANSITION ECONOMIES: EVIDENCE FROM POLISH LISTED GROUP FINANCIAL STATEMENTS

Marek Schroeder

ABSTRACT

The paper proposes the use of the incidence and amount of negative and positive goodwill on consolidation as an accounting indicator of progress in transition from a command to a market economy. The proposition is assessed using longitudinal data spanning the seven years from 1995 to 2001, extracted from the consolidated financial statements of a sample of Polish listed groups. The results of the analysis of the microeconomic data provide mixed support for the more positive assessments of Poland's progress in transition provided by political and macroeconomic indicators.

1. INTRODUCTION

This paper examines the proposition that the amount of negative goodwill on consolidation in the financial statements of listed groups in countries

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undertaking the transition from a command to a market economy will initially be material but, subsequently, will decline in amount as reform-generated systemic instability decreases and macroeconomic conditions stabilise. Conversely, positive goodwill on consolidation will increase in incidence and amount. Hence, the amount of goodwill on consolidation disclosed in the consolidated financial statements of listed groups in transition countries may be used as an indicator of progress in transition, i.e., the success or otherwise of macroeconomic reform policies.

This proposition is based on the following analysis. In well-developed market economies, it is usual for bundles of assets to change hands at a premium to their market or fair values, resulting in the need for consolidated financial statements to accommodate the positive goodwill on consolidation that arises as a result of the transactions. This is the expectation at least in the United Kingdom (UK), for example, which may be seen from the attitude of the UK's Accounting Standards Board (ASB) to negative goodwill on consolidation (ASB, 1997, App. III, para. 58):

> As negative goodwill is expected to occur rarely, negative goodwill in excess of the fair values of the non-monetary assets acquired is expected to occur only extremely rarely and in unusual circumstances.

The resulting position with respect to positive goodwill on consolidation is often material and its accounting treatment has been both controversial and changing not only in the UK but internationally (e.g., International Accounting Standards Committee [IASC], 1983; IASC, 1993; IASC, 1998).

In transition economies, on the other hand, bundles of assets may be more likely to change hands at a discount to their market or fair values resulting in the need for consolidated financial statements to accommodate the negative goodwill on consolidation which arises as a result of the transactions. The proposition maintains that the resulting position will be material and its amount and incidence will often exceed any reported positive goodwill on consolidation. Because one of the defining characteristics of a command economy was the absence of a market for corporate control due to the ubiquitous nature of state ownership of the means of production (Kornai, 1992, p. 361), macroeconomic inter-systemic reform policies in transition countries included privatisation programmes designed to transfer ownership into the private sector. Combined with the liberalisation of markets, generally, these programmes created fledgling markets for corporate control in which bundles of assets were traded among private parties, both domestic and foreign. However, the initial stages of macroeconomic inter-systemic reform designed to transform a command into a market economy were accompanied by profound political, social and economic upheavals, which resulted in prolonged uncertainties characteristic of systemic instability. Hence, in the early stages of transition, the acquisition of bundles of assets carried a high degree of systemic risk, which was reflected in a depressed purchase consideration. For example, the bundles of assets traded were encumbered with unrecorded liabilities representing the costs of modernisation or the restructuring required to transform the business into a viable market participant. In the light of such factors, in transition economies, bundles of assets may be acquired at a substantial discount to their market or fair values, resulting in the creation of material amounts of negative goodwill on consolidation. However, over time, and assuming the success of economic reform policies, the incidence and amount of negative goodwill on consolidation will decrease (and that of positive goodwill on consolidation increase) as the transition economy increasingly adheres to well-developed market economy conditions.

This paper assesses the above proposition using empirical data gathered from the consolidated financial statements of listed groups in Poland covering the seven-year period from 1995 to 2001. However, the test could be replicated using equivalent data (if available) from any of the other 26 transition countries (European Bank of Reconstruction and Development [EBRD], 2001).

It may be argued that the measure of progress in transition proposed above is superfluous because an abundance of such measures already exist. Annual reports on the progress made by the transition countries which have qualified for membership of the European Union (EU) have been published by the European Commission. However, these reports cover only a minority of all transition countries and are themselves part of a complex political process of membership negotiations between the candidate countries and the EU which are always susceptible to the criticism of subordinating objective criteria to political expediency. More objective measures of the progress made by all transition countries may be found in the annual Transition Report published by the European Bank for Reconstruction and Development (EBRD) (e.g., EBRD, 2001). However, these macroeconomic data are at a very high level of aggregation and do not include data from the published financial statements of groups of companies. An additional indicator of progress in transition based upon reported financial performance disclosed at the microeconomic level of the firm may usefully supplement more macroeconomic measures and should be expected to be consistent with them.

The paper proceeds as follows. A brief literature review is followed by a section detailing the de jure accounting rules for the determination of positive and negative goodwill on consolidation that were in force in Poland for the seven-year period from 1995 to 2001. The next section deals with the data and methodology of the paper. This is followed by a section that analyses the empirical data gathered from the consolidated financial statements of the sample of groups listed on the Warsaw Stock Exchange. The final section outlines the conclusions of the study, its limitations and proposals for future research.

2. LITERATURE REVIEW

The literature on accounting reform in transition economies has generally taken an approach that accepts as given the systemic changes at the macroeconomic level and analyses the consequent effects at the microeconomic level of (usually) de jure accounting rules. Reform of the economy is the driver of de jure accounting reform. Hence, for Jermakowicz and Rinke (1996), accounting reform in the Czech Republic, Hungary and Poland had been undertaken with reference to EU Directives and International Accounting Standards, as a direct result of macroeconomic reforms designed to transform former command into well-developed market economies. Adams and McMillan (1997) argued that the newly emerging market economy resulted in pressures that led to the internationalisation of financial reporting in Poland. A similar argument underpinned more recent analyses of reform of de jure accounting rules in relation to acquisition accounting undertaken by Craner, Krzywda, Novotny, and Schroeder (1998, 2000) for the Czech Republic and Poland, and Jelic, Alexander, and Briston (2000) for the Czech Republic. The approach in the literature cited above was consistent with a view that saw accounting as a dependent variable, which changed in response to reforms at the macroeconomic or societal level (e.g., Nobes, 1998).

This paper takes an approach different from, but not inconsistent with, that described above. In this alternative view, de jure accounting rules are accepted as a given and their de facto application in practice used as a window through which macroeconomic reform is observed and assessed. From this changed perspective, the question is not ‘What can macroeconomic reform tell us about accounting?’ but, rather, ‘What can accounting tell us about macroeconomic reform?’ In this sense, the paper breaks new ground in the areas covered by the existing literature on accounting reform in transition economies, in that data on positive and negative goodwill on consolidation are used to assess progress in transition rather than macroeconomic reform being used to explain consolidation accounting rules at the microeconomic level. The paper also breaks new ground in its focus on longitudinal empirical data from de facto accounting practice, i.e., as disclosed in the financial statements of listed groups.

3. ACCOUNTING RULES

For the whole of the period under review (from 1995 to 2001) the de jure rules governing acquisition accounting in Poland were contained in a separate chapter (chap. 6, Arts. 55–63) of the *Ustawa o rachunkowości* [Act on Accounting] (hereafter, Accounting Act 1994) approved by the Polish parliament in September 1994 and applicable to all accounting periods beginning on or after 1 January 1995. No material amendments were made to these provisions during the period under review.

The detailed accounting rules that related to positive and negative goodwill on consolidation during this period were as follows. Both positive and negative goodwill on consolidation were required to be determined by reference to the group share of net assets acquired measured at market values (Art. 58(2)). This requirement is important for the purposes of this paper because it endows the resulting goodwill amounts with an economic significance, which would otherwise be lacking were the amounts calculated with reference to unadjusted book values at the acquisition date. The positions were to be separately disclosed in the consolidated balance sheet with positive goodwill on consolidation (*wartość firmy skonsolidowanej*) shown as an intangible asset (Art. 58(2)(1)) and negative goodwill on consolidation (*rezerwa kapitałowa z konsolidacji*) shown as a separate position independent of equity (Art. 58(2)(2)). Both positions were to be amortised over a period not exceeding five years on a per annum basis, and any write-offs were to be shown in separate positions on the face of the profit and loss account (Art. 58(5)). Similar provisions applied to the positive or negative goodwill on consolidation arising on the acquisition of associated entities (Art. 59). The group's accounting policies with respect to positive and negative goodwill on consolidation were required to be disclosed in the notes to the accounts (Art. 61(2)).

Negative and positive goodwill capitalised in the consolidated balance sheet could be written off immediately to the profit and loss account if this was justified by the economic circumstances of the subsidiary or associate (e.g., unexpectedly poor performance) (Art. 7). In the case of the disposal of an investment, any un-amortised goodwill on consolidation was required to be taken into account in determining the gain or loss on disposal (Art. 58(6)).

Transitional provisions applied to investments acquired prior to the provisions of the Accounting Act 1994 coming into force on 1 January 1995. For investments acquired prior to this date, negative and positive goodwill could be determined by reference to the book value of assets as at 31 December 1994. The normal write-off rules then applied.

In a subsequent revision of the Accounting Act 1994 (effective for accounting periods beginning on or after 1 January 2002), the rules governing accounting for positive and negative goodwill on consolidation have undergone amendment to bring them into line with more current international financial reporting standards. However, for the period under review (1995–2001), the accounting rules were clear in that both positive and negative goodwill on consolidation were:

– determined with reference to market values for acquisitions made after 1 January 1995;
– capitalised and written off over a maximum period of five years; and
– clearly disclosed in the consolidated financial statements.

4. DATA AND METHODOLOGY

Table 1 details how the sample of 50 listed groups that provides the data for the paper was selected. On the one hand, it was desirable to maximise the number of groups in the sample, for obvious reasons. On the other hand, the paper's methodology required a reasonably long run of historical data covering the seven-year period from 1995 to 2001 inclusive. These two desirable objectives were not mutually compatible. By the end of 1996, a total of 111 entities had been listed on the Warsaw Stock Exchange and could provide a six-year run of historical data pertaining to negative and positive goodwill on consolidation. A six-year minimum period was chosen because it more than spans the maximum period of five years allowed by Polish accounting regulations for the write-off of goodwill on consolidation. At the time the data were collected, the latest available financial statements were for the 2001 financial year ending on 31 December. Hence, this consideration

Table 1. Composition of the Sample of Listed Groups.

	1991	1992	1993	1994	1995	1996	Total
Number of entities admitted to listing in the year	12	6	9	33	24	27	111
Number of entities subsequently delisting[a]	4	1	3	5	5	8	26
Financial services entities[b]	–	3	2	7	5	1	18
Entities that are not groups	–	–	1	6	2	8	17
Total sample	8	2	3	15	12	10	50

Source: Polish Securities Commission Annual Report, 1996.
[a]Due to merger/takeover, at own request or by order of the Securities Commission.
[b]Primarily banks but also insurance entities.

determined the cut-off date of 1996 in the table. However, by the end of 1996, a number of entities had de-listed, which reduced the potential sample size by 26 entities. Banks and insurance entities were excluded from the sample because of the very different nature of their balance sheet asset structures and profit and loss account revenues and expenses. This removed another 18 entities from the sample. Finally, some listed entities were simply not groups and hence were excluded from the analysis automatically: a total of 17 entities. The final sample of 50 listed groups was, therefore, the largest available given the above parameters. However, this is not to say that all 50 groups in the sample were groups for the whole of the period under review. For inclusion in the sample, it was sufficient for the entity to have been listed by the end of 1996 and to have produced a set of consolidated financial statements for the 2001 financial year. This approach to sample selection maximises the sample size of groups but at the expense of available data for analysis for some years.

The Polish Securities Commission operates a comprehensive reporting regime for listed entities. Financial results have to be reported in standard formats monthly, quarterly, half-yearly and annually. Annual consolidated financial results are reported on form SA-RS, which comprises a balance sheet, profit and loss account, cash flow statement, statement of movements on reserves and an extensive set of supporting notes and analyses for the current and previous year. The SA-RS form is accompanied by the management board report, the auditor's opinion as well as the auditor's long form report. In all cases, the data analysed in this paper have been extracted from the information contained in these SA-RS forms.

The paper's proposition is that the claim that Poland is a typical and well-functioning market economy may be assessed using accounting data on the incidence and amount of negative and positive goodwill on consolidation

Table 2. Behaviour of Goodwill in Consolidation in Transition and Market Economies.

	Transition Economy	Market Economy
Incidence and amount of negative goodwill	High	Low
Incidence and amount of positive goodwill	Low	High

reported in the consolidated financial statements of listed groups. The proposition is based upon the view that negative goodwill on consolidation occurs only rarely in the consolidated financial statements of groups listed in well-developed market economies. In transition economies, on the other hand, negative goodwill on consolidation will occur more frequently but will diminish over time as systemic instability decreases and the economy takes on a more normal structure to be replaced in turn by an increasing incidence and amount of positive goodwill on consolidation. The proposition is summarised in Table 2.

The analysis summarised in Table 2 has clear consequences in terms of the data that need to be obtained from consolidated financial statements in order to assess progress in transition to a market economy. Evidence needs to be obtained regarding the incidence of goodwill on consolidation in financial statements, but then its amount needs to be assessed in terms of materiality in relation to, for example, total assets, total equity and the profit and loss before tax. The paper's methodology incorporates certain assumptions about the trends of reported negative and positive goodwill on consolidation across the period. To be consistent with the propositions in the paper, negative goodwill should decrease in incidence and amount while positive goodwill, conversely, should increase in incidence and amount. However, the trends observable in the data may conform to the expected pattern but as a result of confounding errors rather than for the reasons suggested by the paper's proposition. This section of the paper examines the sources of these potentially confounding errors and assesses their importance for the interpretation of the subsequent data.

One major source of confounding errors is to be found in the area of accounting policy choice with respect to negative and positive goodwill on consolidation. For example, a group may decide to change its accounting policy with consequent impacts upon the incidence and amount of goodwill reported. The sample of 50 groups contains only four such examples across the seven-year period, however. Alternatively, a group may decide to treat negative and positive goodwill asymmetrically, for example, by adopting a one-year period to write off positive goodwill but writing off negative goodwill over a five-year period. Such asymmetrical treatment of negative and positive goodwill has a consequent impact upon the number of times each position appears in the financial statements (incidence) and on its amount (as a percentage, e.g., of total assets, total equity or profit or loss before tax). However, in the overall sample of 50 listed groups, only three examples of the asymmetrical treatment of negative and positive goodwill on consolidation appear.

Hence, due to the low frequencies of accounting policy change and asymmetrical treatment of negative and positive goodwill in the sample, these sources of confounding errors in the data may be tolerated. For completeness, Table 3 details the actual accounting policy choices made by the listed groups in the sample. The table reveals that accounting policy choice clusters around durations of either five or three years, both of which durations are comfortably spanned by the seven year horizon for the empirical data.

Another major source of confounding errors is to be found in the very nature of the individual transactions that give rise to the goodwill in the first place. Because the paper's purpose is to provide an easily accessible and interpretable accounting indicator of progress in transition, it has eschewed an approach that analyses the amount of negative and positive goodwill arising on each and every acquisition because this would be too time-consuming, albeit more accurate and reliable. However, this short-cut approach does have its disadvantages. For example, the paper's proposition concerns transition economies alone, and hence its data should exclude all acquisitions of foreign subsidiaries or associates. However, the goodwill

Table 3. Diversity of Accounting Policy Choice in Respect of the Duration Over which Negative and Positive Goodwill are Written Off.

Duration (months)	Negative Goodwill–Number of Groups	Positive Goodwill–Number of Groups
60	34	29
36	4	5
24	1	1
12	4	1
Immediate	1	1
Not applicable[a]	6	13
Total sample[b]	50	50

[a]Because neither position appears in the financial statements and an explicit policy is not stated.
[b]In the case of accounting policy changes, the above data include the accounting policy with the longest duration over the period 1995 to 2001.

Table 4. Total and Average Number of Subsidiaries and Associates in the Sample of Listed Groups as on 31 December 2001.

	Foreign	Domestic	Total
Total number			
Subsidiaries	35	365	400
Associates	14	104	118
Total	49	469	518
Average number (n = *50*)			
Subsidiaries	1	7	8
Associates	0	2	2
Total	1	9	10

reported in the financial statements of listed groups is not analysed between that arising on domestic as opposed to foreign acquisitions. However, there is evidence to show that this problem is not material.

Table 4 gives a breakdown of the number of subsidiaries and associates in the sample of Polish listed groups as on 31 December 2001 analysed between foreign and domestic investments. The total amount of foreign direct investment is small and, in any case, most investments are located in other transition economies. As a result, the likelihood that the trend of positive goodwill will be distorted upwards by substantial acquisitions in well-developed market economies is negligible. Notwithstanding the above analysis, the data in the sample contain one such example of a foreign acquisition that generated a material amount of positive goodwill. However, Table 4 clearly confirms that the data relate almost exclusively to the Polish market.

A second problem that arises from the paper's adoption of a short-cut approach to its analysis of goodwill relates not to the acquisition but rather to the disposal of subsidiaries and associates. In common with most other countries, Polish accounting regulations require that the gain or loss reported on the disposal of a subsidiary or associate be calculated after taking into account any un-amortised negative or positive goodwill on consolidation. The implication of this accounting treatment for the data analysed in the paper is that goodwill will disappear from the consolidated balance sheet without being reported as goodwill written off on the face of the consolidated profit and loss account, because the goodwill is subsumed in the reported gain or loss on the disposal of the subsidiary or associate. As a result, for example, an increasing trend in balance sheet positive goodwill will be understated and a falling trend in balance sheet negative goodwill

will be exaggerated. Short of analysing each and every transaction, there is no way of compensating for this confounding error, and it remains as a weakness in the paper's methodology whose effect cannot be estimated given the data.

A less important distortion occurs in circumstances where the group legitimately overrides its normal accounting policy and writes off negative or positive goodwill immediately, either because the subsidiary or associate is performing particularly poorly (in the case of positive goodwill) or because of reorganisation or restructuring (in the case of negative goodwill). This distortion is regarded as less significant because although the goodwill disappears from the consolidated balance sheet, it is captured in the consolidated profit and loss account, unlike the goodwill on disposals. The data contain only 10 such instances, and hence its occurrence may not be considered as a major confounding error.

A key aspect of the paper's methodology is the adoption of a historical perspective, and hence it is important to obtain sufficient data across a sufficient number of years in order to capture changing trends. Table 5 details the number of available years' data across the sample as a whole. Given that the consolidation requirement in Polish accounting legislation only became effective at the beginning of the 1995 calendar year, the table reveals that a full seven years' data are available for almost half the sample. A total of six years' data are available for 74% of the sample and the data cover five years for 86% of the sample of listed groups. Clearly, not all the sample groups were actually groups for the whole of the period. Nevertheless, the analysed data comprise 299 individual sets of consolidated financial results spanning a seven-year period.

A final confounding error relates to the nature of the transition itself and the fact that de facto groups existed prior to the introduction of the

Table 5. Available Years of Financial Statement Data in the Sample of Listed Groups.

Years of Data	Number of Groups
7	23
6	14
5	6
4 or less[a]	7
Total	50

[a]For two groups there are only two years of data.

consolidation requirement on 1 January 1995. The goodwill arising on acquisitions prior to this date was determined by reference to book values as on 31 December 1994 and hence lacks the economic significance of goodwill determined with reference to market values. However, Table 5 clearly indicates that for 54% of the group in the sample, data relating to goodwill on consolidation commence in 1996 or later, hence reducing the distorting effect of this particular anomaly.

5. ANALYSIS OF EMPIRICAL DATA

Table 6 details the incidence of negative and positive goodwill on consolidation in the financial statements of the sample groups for the seven-year period from 1995 to 2001 inclusive. The data indicate that, across the period as a whole, the number of groups reporting negative goodwill only is decreasing while the number of groups reporting positive goodwill only is increasing. These trends support the view that the Polish market is becoming more typical over time. However, for all years, the biggest proportion of the sample is to be found in the category that reports both negative and positive goodwill. Over the period, the number of groups in this category increases slightly. As a result, when the total incidence of negative and positive goodwill is examined, the same trends of decreasing negative and increasing positive goodwill are still observable, but that for negative goodwill is less marked. Perhaps the most important facts revealed by the data in the table are that the incidence of negative goodwill remains persistent across the period and, even at the end of the period, its existence is still being reported by a majority of the groups in the sample. These data are not consistent with the view that the Polish market economy is completely typical, defined as an economy in which the occurrence of negative goodwill on consolidation is rare.

Table 7 tackles the issue of materiality: for how many listed groups are negative and positive goodwill material to their financial results? The materiality threshold has been set at 5%, a figure that is ultimately arbitrary but in common use both statistically and in, for example, the statutory auditing profession. For goodwill written off in the consolidated profit and loss account, the threshold is applied to the profit or loss before tax and after charging or crediting any goodwill. The focus is on the figure reported on the face of the profit and loss account as opposed to the profit or loss before goodwill, which is not separately disclosed. For positive goodwill in the consolidated balance sheet, the threshold is applied to total assets

Table 6. Incidence in Financial Statements of Listed Groups of Negative and Positive Goodwill on Consolidation 1995–2001.

Year (Number of Groups)	1995 (24)	1996 (39)	1997 (43)	1998 (48)	1999 (48)	2000 (49)	2001 (48)
Consolidated balance sheets reporting (in %)							
(a) Both negative and positive goodwill	29	31	35	43	40	31	35
(b) Negative goodwill only	33	26	21	17	12	16	17
(c) Positive goodwill only	17	12	23	17	19	24	23
(d) Neither	21	31	21	23	29	29	25
	100	100	100	100	100	100	100
Consolidated balance sheet: incidence of (in %)							
Negative goodwill (a + b)	62	57	56	60	52	47	52
Positive goodwill (a + c)	46	43	58	60	59	55	58
Consolidated profit and loss accounts reporting (in %)							
(a) Both negative and positive goodwill	29	36	33	46	46	45	46
(b) Negative goodwill only	33	23	25	17	14	6	12
(c) Positive goodwill only	9	13	21	20	23	22	23
(d) Neither	29	28	21	17	17	27	19
	100	100	100	100	100	100	100
Consolidated profit and loss account: incidence of (in %)							
Negative goodwill (a + b)	63	59	58	63	60	51	58
Positive goodwill (a + c)	38	49	54	66	69	67	69

Table 7. Incidence of Material[a] Goodwill on Consolidation in the Financial Statements of Listed Groups 1995–2001.

Year (Number of Groups)	1995 (24)	1996 (39)	1997 (43)	1998 (48)	1999 (48)	2000 (49)	2001 (48)
Percentage of groups reporting material[a]							
Balance sheet negative goodwill	21	21	16	13	8	4	10
Balance sheet positive goodwill	4	3	2	0	2	4	4
Profit and loss negative goodwill	25	21	23	29	27	20	19
Profit and loss positive goodwill	0	8	5	25	29	33	31

[a]The materiality threshold has been set at 5% (a) of total equity for balance sheet negative goodwill; (b) of total assets for balance sheet positive goodwill; (c) of profit or loss before tax for goodwill written off.

including positive goodwill, while for negative goodwill it is applied to total equity excluding negative goodwill. Such an approach may seem inconsistent, but in each case the focus is on the figures appearing on the face of the consolidated balance sheet.

The results in Table 7 clearly show that material balance sheet negative goodwill is far from rare at the beginning of the period but becomes rarer over time. These results are consistent with the paper's proposition. However, material balance sheet positive goodwill is rare at the beginning of the period and remains so until the end of the period instead of exhibiting a steady increase. These results provide mixed support for the proposition. The profit and loss account figures are also mixed. Material negative goodwill starts out being far from rare but, even in 2001, still affects almost one in five listed groups. Material positive goodwill, on the other hand, increases in incidence over the period. The profit and loss data need to be interpreted bearing in mind the economic background affecting the absolute size of the financial result: from 1998 onwards, the frequency of loss-making groups in the sample increases and hence profits for the 1998–2001 period may be depressed due to overall difficult trading conditions. This may explain the increased incidence of profit and loss as opposed to balance sheet goodwill materiality.

Consistent with the results on incidence in Table 6, the data on materiality in Table 7 fail to confirm unambiguously that Poland is a typical market economy as at the end of 2001. Negative goodwill on consolidation in the financial statements of listed groups remains material in both incidence and amount.

6. CONCLUSIONS

The major conclusion to be drawn from the analysis above is that the microeconomic data regarding negative and positive goodwill on consolidation, extracted from the financial statements of the sample of listed groups, provide mixed support for the more positive assessments of progress in transition provided by political and macroeconomic criteria. The persistence of negative goodwill on consolidation, whose occurrence in well-developed market economies is expected to be rare, is evidence of the continuing and prolonged nature of the Polish transition from command to market economy. This conclusion has implications for the way in which consolidated financial statements are used and interpreted, especially for any assessment regarding the future profitability of acquisitions, for example.

The approach taken in the paper with reference to listed groups could be usefully extended to include unlisted groups. The analysis could also be extended to listed groups in other transition countries and the results benchmarked against those in this paper. As this is the first paper to adopt such an approach, the interpretation of the data is hampered by the lack of such a benchmark.

The paper has attempted to provide an accounting indicator of progress in transition that is easily available and accessible. As a result, the indicator is susceptible to distortion by a number of confounding errors, which may or may not have a material impact on the results. In the Polish case, the main confounding error may be goodwill disappearing from balance sheets as a result of disposals. The incidence of other sources of confounding errors is small enough to be ignored.

The accounting data reported in this paper give, at best, mixed support for the proposition that Poland is a typical market economy. However, it may be that progress in accounting reform and transition overall cannot be measured by numbers alone. A more important test, albeit quantitative and qualitative, against which progress in transition needs to be measured and which, on the basis of the data analysed in this paper, Polish financial reporting passes with flying colours is as follows: are the financial statement data publicly available and easily accessible? In how many other countries undertaking the transition from a command to a market economy are the consolidated financial statements of listed groups publicly available and easily accessible? The continuing lack of published academic papers containing empirical analyses of the financial statement data of transition companies and groups stands as a paradoxically vocal response to this question. As long as this state of affairs persists, detailed comparisons between, for example, international financial reporting standards and national accounting regulations in transition countries remain merely, in the worst sense of the word, academic.

IN MEMORIAM

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LENDING DECISIONS AND ACCOUNTING INFORMATION: EVIDENCE FROM BANGLADESH

Mohammad H. A. Khan and Shahzad Uddin

ABSTRACT

This paper reports on the role of accounting in lending models used by lending companies for small firms in an emerging economy. Investigations reveal that formal lending models tend to rely primarily on accounting information. However, there is a tendency for lenders to give the highest priority to personal relationships when making lending decisions. The study also reveals that lending processes are influenced by a series of contextual factors, including political interventions, regulations, the culture of cronyism and other complex socio-political and socio-economic factors.

1. INTRODUCTION

This paper stems from an interest in lending in small firms and the role of accounting therein. The development of small firms has been an essential part of the development strategy in many countries, including developed countries such as Japan, the USA, and the UK (Levitsky, 1987; Nelson,

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1987a, 1987b; Petrof, 1987; World Bank, 1978). The Bangladesh government adopted this development strategy soon after independence in 1972 without any notable success (Germidis, Kessler, & Meghir, 1991; Government of Bangladesh, 1995; World Bank, 1995). Despite the importance of lending in small business firms to the development of less-developed countries, policymakers and academics have displayed little interest in studying these issues. This paper contributes to this area by providing an empirical analysis of the role of accounting (if any) in lending in small firms[1] in less-developed countries, especially Bangladesh.

The uses of accounting information in management and business decisions trigger many ideas and research projects, especially in Western countries, among accounting researchers. What seems to be neglected, even in the developed world, is the serious lack of understanding of the role of accounting information in bank lending decisions. Conventionally, accounting is understood to be a neutral tool for external and internal users in their decision making, with the two primary external user groups identified as investors and lenders (Danos, Holt, & Imhoff, 1989, p. 235). Contemporary accounting researchers are rather concerned to understand accounting not simply as a set of neutral techniques but as a *political process*, one effect of which is to lend support to lending decisions (Armstrong, 1987; Hopper, Storey, & Willmot, 1987; Knights & Collinson, 1987). Whatever, it is very important from the small-firm owner's perspective how lenders process accounting information in their decision-making processes. Although there is a considerable body of literature on lending processes, only a few studies are focused on the role of accounting in lending decisions taken by lenders, especially for small firms, and these are mainly from the USA and the UK (Berry, Faulkner, Hughes, & Jarvis, 1993; Taylor & Aljifri, 2002; Uddin & Khan, 2004). Thus, drawing heavily from the lending literature, this paper aims to investigate the lending process and understand the influence of accounting information[2] in lending decisions, especially for small firms in Bangladesh.

The paper begins by reviewing the literature on the role of accounting in lending models mainly developed in the Western context followed by a brief section on the research methods adopted. The next section presents a discussion of small firms' development and the banking system of Bangladesh to provide the reader with a better understanding of the context of this study. The paper then analyses the lending model practices and the role of accounting therein and compares and contrasts the researchers' findings with those in Western countries before the concluding section.

2. THE ROLE OF ACCOUNTING INFORMATION AND LENDING MODELS

Researchers argue that the loan-evaluation process in lending companies is expected to consider and evaluate both accounting (mainly accounting information) and non-accounting (qualitative) information concerning loans proposed for small firms and their future owners (Berry, Crum, & Waring, 1991; Berry et al., 1993; Bryce, 1960; Cohen, Gilmore, & Singer, 1966; Dewhurst & Burns, 1983; Nutt, 1989). Berry et al. (1993) found that lenders in the UK pay enormous attention to accounting information in order to deal with the loan applications of small firms. May (1994) argued that a sound lending decision is unlikely to be attainable unless the appraisal examines accounting alongside qualitative information. These points are further discussed below.

Reviewing the lending literature and drawing from Berger and Udell's (2002) work, small business lending by lending companies can be categorised into at least four main distinct lending technologies – financial statement lending, asset-based lending, credit scoring and relationship lending. The first three lending models, alternatively called transaction-based lending, rely heavily on published information, often accounting information. These technologies are deployed to address the types of problems that can lead to either credit rationing or 'overlending' (Berger & Udell, 2002, p. F36; de Meza, 2002; de Meza & Webb, 1987; Stiglitz & Weiss, 1981). The success of the lending models appears to rest on the quality of accounting information available to lenders.

Financial statement lending places considerable emphasis on evaluating accounting reports. Thus, decisions about lending basically stem from the strength of the financial position. This type of lending is largely relevant for those small firms that have audited accounting reports and have transparent internal and external reporting systems. New entrepreneurs and recently established small firms have little chance of getting loans if lending companies apply this model. Lending decisions under asset-based lending rely on the quality of the available collateral. Lending companies generally take current assets as the collateral under this method. Heavy monitoring of the borrower's assets is essential for the lending companies. Small business credit scoring is an adaptation to business lending of discriminate analysis and other statistical techniques which have long been used in consumer lending (Berger & Udell, 2002, p. F37). This model places heavy emphasis on the credit history of small-firm owners and the firms themselves, in addition to using information from accounting reports. The credit-scoring system requires certain preconditions, such as the availability of a published database, specialist organizational support, and informational infrastructure such as reliable accounting reports, which are often lacking in less-developed countries such as Bangladesh. On the other hand, lending companies could develop in-house credit-scoring infrastructures, which might have a limited use in the context of developing countries.

The role of accounting in transaction-oriented models adopted by Western lending companies for small firms is critical to successful loan applicants. These models require quality information, mostly expected from accounting reports, which are not readily available for small business firms in less-developed countries. These lending models rely heavily on accounting information supplied by the small-firm owners not only for granting loans but also for monitoring the loans. Previous studies on the transparency of accounting reports in less-developed countries have suggested that even large companies often do not comply with the disclosure requirements (Ahmed & Nicholls, 1994; Abu-Nassar & Rutherford, 1996; Larson, 1993; Larson & Kenny, 1995; Perera, 1975, 1989; Wallace & Briston, 1993). The authors' suspicion is that most of the companies, even large ones, in less-developed countries would not qualify for financial statement lending if the same criteria were to be followed.

'Relationship lending' is one of the lending models often used by the lenders in the absence of proper accounting information (Berger & Udell, 1998, 2002; Boot, 2000). Bank officials invest time to acquire necessary and relevant information about the lending applications using various strategies, including contact with the firm itself, its owner/owners, the community, and other sources as the bank sees fit. This information is often soft data because it contains information about the character and reliability of the firm's owner, and may be difficult to quantify, verify, and communicate through the normal transmission channels of a banking organisation. Thus, much more emphasis is placed on qualitative rather than accounting information in relationship lending. Previous studies, mainly in developed countries, have suggested that a bank's relationship with small owners is essential not only for monitoring purposes but also for determining the credit available, credit terms, revisions of existing loans and for a variety of other reasons (e.g., Berger & Udell, 1995; Cole, 1998; Elsas & Krahen, 1998; Harhoff & Korting, 1998; Petersen & Rajan, 1994, 1995). Researchers and practitioners ideally expect this kind of lending model to be practiced by lenders in Bangladesh, where accounting information is virtually absent in small firms.

Despite the focus of the academics and policymakers focus on appropriate lending practices, there is hardly any empirical research on this issue, especially in less-developed countries. Even in developed countries, a satisfactory analysis of precisely what role accounting could play in bank-borrower relationships is surprisingly absent. This paper seeks to add to the limited body of knowledge by focusing on the role of accounting information in the lending process in the empirical context of poorer countries such as Bangladesh. In this paper, we seek to ask the following questions: How do lenders of small firms in Bangladesh make their lending decisions? Do they rely heavily on accounting and or qualitative information, like their Western counterparts? Can the lending practices be modelled?

3. RESEARCH METHODS

The research methods adopted in this study are influenced by the previous research in this area. Researchers have argued that a qualitative approach is essential to understand the lending behaviour to small business (Berry et al., 1993). Bryman (1988) provides a strong argument for combining approaches, citing the classic study of bank clerks by Crompton and Jones (1984) as an example of the effectiveness of such an approach (Berry et al., 1993, p. 132). This approach is best suited to a qualitative approach, which allows researchers to understand and gain rich insights into the subject.

Bearing this in mind, this study used a variety of data sources (Denzin, 1978) to answer the research questions identified above. It mixes both qualitative and quantitative methods, such as interviews, a questionnaire survey and examination of documents, to help generate a rich source of field data with internal checks of its validity. Interviews were organized with bankers, especially head office officials. A sample of small-firm owners was also chosen for interview to ensure representation from the demand side of the loan market. A range of issues was discussed during the interviews, including credit appraisal methods, loan monitoring, dealings with small-firm owners, banking strategies, etc. Copies of the questionnaire[3] were distributed among the "professional" loan officials[4] of 21 different lending companies, which covered all the lending companies[5] with significant involvement in lending to small firms. In each of the lending companies, loan officers were requested to give their answers to questions related to, among others, the following: the presence of any methods or systems used in deciding on small-firm lending, as prescribed by the appropriate government ministry or the central bank; the lending company's own policy in financing small firms; the extent to which any model of lending was followed in decision making or financing small firms; the model's effectiveness and defects, as identified by the loan officers; the loan officers' views on failure of small firms, and the role of the bank's loan evaluation methods in firm failure; and the existence of lending contracts and monitoring procedures in lending activities and the role of accounting information in both loan monitoring and contracting. In the questionnaire, there are 18 broad questions, most of which contain one or two but up to five sub-questions. Those questions attempted to gather 70 types of data, ranging from 'definition of small firms' to lending bodies' views on government policy, their own lending policy and the role of small-firm owners. Questionnaires were also handed out to small-firm owners. A sample of 76 small-firm owners was selected in this process.

The questionnaire survey is one of the sources of empirical findings for this paper. However, the results and methods from the questionnaire survey are reported in more detail in Uddin and Khan (2004). This paper relied heavily on interviews with small-firm owners and some survey results from the lenders. Small-firm owners mainly commented on loan evaluation methods and lending companies' behaviour with regard to judging the feasibility of projects. Secondary data were obtained which related to economic development in general. These three methods of data analysis allowed us to complete the process of triangulation (Miles & Huberman, 1984). A variety of tactics to check the validity and reliability of responses to the questionnaire were employed, including triangulation across data sources and methods, getting feedback from participants in the study and checking rival explanations.

4. BANKING SYSTEM, SMALL FIRMS AND BANGLADESH

Banking systems in developing countries are often either a legacy of colonial times or copies of the financial set-up in developed countries. The banking system of Bangladesh is not different from those of other developing countries. It is composed of a central bank (Bangladesh Bank), a treasury administration (the Finance Division) and a Banking Division under the Ministry of Finance and Banking to formulate further macro-banking policies in consultation with the central bank, commercial banks (state owned, private and foreign), development banks, specialised banks, insurance companies (state owned and private), the stock exchange, investment banks, postal savings bank and cooperative banks (see also Uddin & Khan, 2004).

Bangladesh inherited the above banking structure from the Pakistani sregime (which was in turn inherited from the British Empire). The pre-independence economy was largely dominated by the private sector (66% of total fixed assets of the industrial sector) (Sobhan & Ahmad, 1980). Soon after independence, it faced an industrial ownership vacuum as fleeing West Pakistanis abandoned their substantial share of industrial and commercial companies. In response, the first government of Bangladesh, led by Sheikh Mujibur Rahman, also committed to socialism, started a massive nationalization programme. Within 2 years of independence, this newly independent state owned and supervised about 350 medium and large companies (SOEs), including industrial and trading firms, banks and financial institutions. SOEs became responsible for over 92% of total fixed assets of the industrial sector. As a part of a broader development policy, two new state-owned development lending companies (DFI), the Bangladesh Shilpa Bank and Bangladesh Shilpa Rin Sangstha, were established in 1972 for the specific purpose of financing large and small industries. After the assassination of Sheikh Mujib in 1975, a new military government came into power and brought dramatic changes to the constitution, politics and state policies. This new military government, strongly influenced by the World Bank and the International Monetary Fund (IMF), increasingly turned to market liberalisation, including privatisation (Ahmad, 1976; Ghafur, 1976). Consequently, since then, a considerable number of banks, insurance companies and investment banks have been established in the private sector. Efforts were made to extend the participation of entrepreneurs in the economy and strengthen the role of banks, for example, by lowering bank rates from 9.75% in January 1990 to 5.5% in March 1993, providing funds from the government for specific purposes, e.g., financing small firms, and reducing control from the central bank as far as credit ceilings and interest rates are concerned to ensure competitiveness among banks in the pursuit of economic development (Bangladesh Economic Review, 1995; Government of Bangladesh, 1995). There was a government directive for all commercial private banks and DFIs to lend 5% of their total loanable funds to small firms until 1995. It was proposed in the Perspective Plan for the period of 1995–2010 that this proportion should rise to 15%. All lending companies, excepting a few foreign banks, were actively encouraged to lend in this area of small-firm lending. This further shows that policymakers and aid agencies consider small-firm development to be an essential step forward for the generation of employment, poverty alleviation, human resources and entrepreneurship development, especially for less-developed countries like Bangladesh. However, despite all these measures, small firms have never got off to a good start in Bangladesh. The government's planned investment never materialized (Government of Bangladesh, 1995; World Bank, 1995). It is alleged by small-firm owners that lending practices by the lending companies in Bangladesh are inappropriate to small firms' needs, arbitrary, informal and unsympathetic towards new ventures. Lending companies, on the other hand, often complain that they cannot find financially feasible projects to finance. Assessing the small projects is often a big task, given the serious lack of published information available to the lenders in less-developed countries (Taylor & Aljifri, 2002; Uddin & Khan, 2004). Nevertheless, there is a strong need for researching these complex but important issues. Thus, this paper aims to fill this gap.

5. IDEAL LENDING PROCESS AND ACCOUNTING

Bangladeshi lending companies officially adopt a systematic/bureaucratic lending model, with few exceptions, as the fieldwork revealed (see also Uddin & Khan, 2004). There are a number of stages to be completed before disbursing funds to small firms, including initial contact, initial scrutiny, formal appraisal and loan sanction. These are discussed below.

Ideally, the lending process would comprise three major phases. The first phase starts as soon as the applicant makes the initial contact. Soon after the application, lenders go through a process which is termed the 'initial scrutiny'. At this stage, ideally, lending companies screen out risky loan proposals at first sight to reduce the total number of applications to be processed. Initial scrutiny is reported to assess a number of issues, including the general attitude of the promoter or owner of the small firm applying, previous business track record of the borrower (assessed briefly from criteria such as repaying habits), and whether the borrower is an existing customer of that institution. In addition, lending companies often prepare a list of discouraged business sectors to comply with the government regulations and also to enable quicker scrutiny. Once an application form passes the 'initial scrutiny' phase, the second phase begins. This phase involves many bureaucratic steps. First, the appraisal committee studies the application. It has been reported that the formal appraisal system generally comprises several stages of analysis, including economic, accounting, marketing/market, management and technical feasibility studies. This seems to be common and a major part of the lending process for all lending companies.[6] The following briefly discusses the elements of appraisal.

Through an 'economic appraisal', the lending companies seek to establish the desirability of a proposed project based on macro-economic variables; for example, contribution to gross domestic product, generation of employment, earning foreign exchange or saving foreign exchange, and ensuring or enhancing linkages in the small-firm sector. In the financial appraisal, the lending companies are interested in knowing the position of the prospective project or firm based on its future costs and benefits considering all cash inflows and outflows. Lending bodies try to establish the profitability trend of a project or firm and calculate gearing ratios and other financial indicators. In the feasibility assessment of management, the lenders seek to establish the overall effectiveness of the management in running the business, on which the success and failure of the project might be heavily dependent.[7] A 'marketing appraisal' is given high importance by all of the lending companies in the survey. Lending companies are supposed to assess several factors in relation to the marketing aspects of the proposal.[8] Technical feasibility is another area of importance for lenders. Lenders use engineers (who also hold positions in lending companies, e.g., officer or manager) to check on a few technical issues, including whether the proposed or chosen machinery and equipment are appropriate, adequate and compatible for the proposed project; whether the proposed site, type of land and layout of the proposed factory or office buildings comply with the requirements of the project; whether the project site has all infrastructural facilities; and construction-related factors.

After considering the above aspects of the project, the appraisal committee prepares the report and sends it to the 'loan committee'. If the 'loan committee' approves, it then moves on to the 'loan sanction committee' for the third phase. The 'loan sanction committee' finally disburses the funds to the applicant. Interviews with the small-firm owners revealed that final approval of loans could take 6 months to 2 years. An owner of a small firm revealed, 'Lenders take too long time in making lending decisions. Once loan is sanctioned, it again takes a long time for disbursement. When they complete disbursement of the loan they think they have finished their job. They only want return for their invested money, principal and interest on the principal, and do not intend to listen to the problems we face with such wishes to resolve those. Sometimes we find the financier just like a mahajan'.[9]

The formal appraisal stages in an ideal lending process exhibit lenders' heavy reliance on financial indicators alongside some qualitative indicators. The interviews with and survey of high-ranking officials revealed that financial and marketing appraisals are the most important aspects, which all lenders are likely to test before granting loans. Prima facie, the above appraisal stages for granting loans are undoubtedly exemplary, albeit bureaucratic, manifestations of transaction-based models practiced in developed countries (Berry et al., 1991; Dewhurst & Burns, 1983; Nutt, 1989). However, whilst the loan appraisal system is bureaucratically built, encompassing transaction-based models, there were some doubts as to whether this system is rigidly followed. As will be discussed later, this formal transaction-based system is often bypassed and almost all the small-firm owners claimed that bank officers often ignore the detailed system of loan appraisal. Thus, the following empirical questions were posed by the researcher: To what extent is the appraisal system driven by accounting information, as depicted earlier? To what extent do qualitative factors such as personal contacts play a role in the appraisal systems? Do the lending practices in Bangladeshi-lending companies exhibit any similarity to the relationship lending practiced by the lending companies in Western countries? These issues are discussed below.

6. ACTUAL LENDING PROCESS AND ACCOUNTING INFORMATION

The study was guided by a wish to understand how lending decisions are taken in practice and to understand the role of accounting therein. These research aims led the authors to pose three major operational questions for the lending process: What types/sources of information are seen as important by the lenders, what factors drive the lenders to take positive lending decisions and which informational items are seen as instrumental for granting loans? Lenders in Bangladesh seem to rely both on accounting and qualitative information in many ways: as the survey revealed, 7 of the 21 lending companies (33.3%) stated that they gave more weight to accounting than the qualitative information; 2 (9.5%) stated they gave more weight to qualitative than accounting information; 6 (28.6%) stated that they gave equal weight to both accounting and qualitative information and 6 (28.6%) stated that they did not have a set format for relative weightings regarding consideration of accounting and qualitative elements, but that they did consider both types of information. Depending on the lending type, i.e., lending for existing or new firms, the weighting varies. Seventeen of the lending companies stated that the weighting of the two factors varied and 4 stated that it did not. However, irrespective of the borrower's status, lending companies do consider sources of accounting information in the analysis of both existing and new businesses. Nine lending companies stated that they used an independent credit rating organisation as a source of accounting information, while the remaining 12 did not.

Interviews revealed that lenders consider multiple types of qualitative factors in dealing with loan applications and in deciding whether to grant a loan. The factor 'nature of business opportunity', which refers to the lenders' attention to and analysis of the firm's product or service market, received the highest number of positive responses (i.e., 21). Three different types of qualitative information relating directly to the applicant, viz., the borrower is an existing businessman/reputation of the borrower, quality of management and business experience, received the second highest number of positive responses (i.e., 20). The strong response in respect of the borrower being an existing businessman or existing customer of the financier suggests that new customers or first-time borrowers may get less favourable attention in the assessment of loan applications. The responses may also reveal an important aspect of lending behaviour, which can be termed as 'unofficial relationship' or 'personal contact' between the financier and the borrower. This relationship or contact is not unusual or unexpected, but use of this sort of contact has both advantages and disadvantages. Certainly, this does not bear any resemblance to what is described as the relationship model. The placing of a large emphasis on criteria such as 'existing businessman or reputation of the borrower' without considering factors such as 'ability to generate new ventures and entrepreneurial skills' raises suspicion in the authors' minds. Again, this attitude may lead to a reduced involvement of lenders in formal loan evaluation, with the eventual development of a lending culture involving little commitment from and accountability of lending companies. This research finds the possibility of frequent use of this practice by lenders; that is, a project appraisal shows little potential but the project is financed against a relatively higher security, based on an assumption on the financier's part that the borrower, as an existing businessman and/or customer, will be able to run it successfully. However, as the survey revealed, only 1 financier agreed that they might lend on a project on such a basis, while 19 disagreed with this notion and 1 stated that it might happen rarely. Nevertheless, this practice may be more common than is admitted by lenders and may well be responsible for the failure or ineffective running of small firms. The general features pertaining to the small-firm sector in Bangladesh, such as low growth rates, high rate of failure, management inefficiencies, and the apparent absence of good relationships between suppliers of finance and borrowers, suggest that there exists a gap between theoretical approaches and the practical aspects of lending decisions. If it is truly the case, as stated by loan officials in the questionnaire, that they do not provide loans to projects which do not show acceptable prospects under loan appraisal, should it be observed that there is a high rate of failure of small firms, inefficient running of projects and a limited contribution of the small-firm sector to the economy? This poses serious questions about the lending behaviour of lending companies in Bangladesh. These are further discussed below.

Table 1 shows the sources of accounting information for existing and new firms and levels of frequencies. The lending companies clearly place importance on accounting information, as indicated by the frequencies with which they indicate that they always use all sources of information. In the case of existing firms, relatively greater importance is given to the balance sheet and profit and loss account, as compared with the cash flow statement and sources and uses of funds. This may be caused by the concern of lending companies about existing firms' assets and liabilities positions and their profit (or loss) positions. When the high-ranking officials of the lending companies were interviewed regarding sources of qualitative factors, they stated that they used several sources. Table 2 shows these sources and their frequencies. All the lending companies use the loan application form as a source of qualitative information. The source ranked second by frequency of use is the Credit Information Bureau[10] (CIB), although use of this source is a recent practice. Seventeen lending companies stated that they took help from the CIB in gathering information for loan appraisal purposes, indicating general concerns about lending decisions with respect to small firms. Sixteen institutions cited 'previous financier's or current banker's report' as their third main source of qualitative information. Under usual lending

Table 1. Sources of Accounting Information for Lending Decision.

Sources of Information	Level of Uses and Frequencies				
	Always	Frequently	Sometimes	Rarely	Never
Existing firms					
Balance sheet	16	2	3	—	—
Profit and loss a/c	16	2	3	—	—
Cash flow statement	10	5	4	2	—
Sources and uses of funds	10	—	9	1	1
New firms					
Projected balance sheet	16	2	3	—	—
Projected profit and loss a/c	17	2	2	—	—
Projected cash flow statement	16	2	3	—	—
Projected sources and uses of funds	15	1	3	2	—

Table 2. Sources of Qualitative Information.

Sources of Qualitative Factors	Value Label and Frequencies	
	Yes	No
Loan application form	21	—
Information collected by relevant loan officer/branch manager	11	10
Credit information bureau	17	4
First/previous bank's/financier's report	16	5
Detailed CV prepared and submitted by borrower	12	9
Referee (name of which must be included in the application form)	15	6
Interviews of proposed small firm owners by loan official	7	14
Trade and business bodies	6	15

practices, the lending company's branch managers are required to send loan proposals to the immediately higher-level office (usually the regional or zonal office) or, if the loan amount is large, the proposal is sent to head office. Thus, a branch manager has preliminary and important work to perform in connection with collecting information regarding a loan applicant using local contacts and knowledge. From the interviews with the high-ranking officials, it may be inferred that using 'information collected by relevant loan official/branch manager' as a source of qualitative information is not as widely welcomed or accepted by them. This is depicted in Table 2, where only 11 out of 21 high-ranking officials indicated this as a source of qualitative information.

However, the most interesting observation that stood out from the survey and interviews was the use of contact/referee's status and its contribution towards the final approval of loans. This was evidenced from the views expressed by small-firm owners. Fifty-eight out of 76 firms (76%) stated that they felt that personal contacts did play a significant role in lending decisions, and that lending companies were not free from bias arising from this factor. The following statement from a small-firm owner/borrower may also substantiate this: 'The connections and influence with high officials in lending companies and undesirable transaction costs (i.e., bribes) act as an important determinant in receiving good dealings in respect of the applicant and application, and positive and prompt disposal of loan applications'. Lenders do accept that the 'Referees' reports are one of the important sources used to gather information, although this factor was not much highlighted. Fifteen high-ranking officials agreed that their institutions used this source of qualitative information. This seems to be a major deciding factor, as revealed from the interviews with the small-firm owners. In the course of using this source, lenders usually contact a referee concerning the prospective borrower, seeking information on a borrower's financial strengths in general, and attitude and behaviour. Interestingly, some lending companies ask for a referee who is well established in society in general or at least in the financial arena or within that specific lending company. There are suggestions that this reference system has been accompanied by systemised and crude pressure on loan officers, and this would engender problems in dealing with loan proposals using prescribed procedures on the part of lenders. When a financier asks for references from a proposed borrower, the borrower is likely to choose referees in the light of expectations concerning the workings of the loan market, and this might lead that borrower to choose persons of renown, influence or with contacts with the loan provider. A proposed borrower may feel that the chances of successfully obtaining a loan are greater with references of high social, political or bureaucratic status. The lenders reported, through both interviews and questionnaire, that undue or unwanted influence on the part of named referees and other influential persons hampered the normal lending system, making it difficult for loan officials to undertake comprehensive analysis of loan proposals to judge a project's viability. When the owners of small firms were asked similar questions about using influential persons in getting loans, it was argued by 42 (out of 76, i.e., 55%) that lenders were responsible in this regard. The small-firm owners raised several issues regarding the role of the lending companies and referees and the issue of influence. They felt that bankers used these arguments defensively to justify their delayed lending decisions. According to them, because of the sheer complexity of bureaucracy in the lending system, loan officials' rigid attitudes and sometimes uncompromising behaviour led to it taking a very long time for financing decisions to be made in respect of small firms. Many small-firm owners pointed out that bureaucratic complexity and long delays in lending decisions were among the root causes of small firms' ill health or early failure, which occurred due to time and cost over-run factors. The small-firm owners stated that delayed decisions or absence of prompt and spontaneous action relating to loan proposals had become an integral part of the lending process for almost every lending company. Thus, it was felt that either to get the process towards loan appraisal or a lending decision started, or to give some momentum to the pace of the lending process, there was a requirement to use agents or catalysts to push the loan case towards a satisfactory conclusion. With this in mind, borrowers sought influential assistance. The high-ranking officials of the lending companies were asked whether factors such as 'personal contact' influenced lending decisions. Only five of them agreed that they faced such pressure from personal contacts. However, given the strength of opinion expressed by the small-firm owners and given that loan officials of the lending companies either gave no direct reply or avoided questions on personal influence, it may well be that the incidence of such personal contact/influence affecting loan appraisal and loan sanctioning is more prevalent than was stated by the officials of the lending companies.

The other interesting observation from Table 2 is the use of 'interview with the proposed borrower' as a source of information. The literature suggests that relationship lending relies heavily on interviews with the borrower before granting loans (Berger & Udell, 1998). Table 2 reveals that only 7 out of 21 officials at the policy level of the lending companies indicated that they have used interviews with the proposed borrower as a source of information. In principle, this may be a good source of information for lenders, who can communicate with the proposed borrower face-to-face and explore different issues from which a financier can reach an initial opinion regarding a proposed borrower, including judgments as to the borrower's entrepreneurial ability, or relationship with his existing banker, if that person is an existing businessman. Ten of the lenders argued that such interviews would be a time-consuming method. This suggests that lenders are not interested in developing a formal relationship with the borrowers, contrary to the relationship-lending model (Berger & Udell, 1998, 2002; Boot, 2000). Overall, the means of collecting information certainly indicate the uses of transaction-based lending, but there are also efforts on the part of the lenders to use soft data (relationship lending) for making lending decisions. However, to what extent the collected information actually contributes to granting loans is the key question in need of investigation. The following section discusses this issue.

The information included in Table 4 provides an opportunity to analyse the basis of lenders' decisions and to provide a cross-check on the items included in Table 3. These two tables consider two related questions. Table 3 addresses the question, 'How would you rank the following informational items in respect of a firm to be financed?', whilst Table 4 considers the question, 'What is the information you consider most important in evaluating a credit proposal?' This latter question gave respondents the opportunity to mention multiple sources of information. From analysing the information in these two tables, several inferences can be drawn. Firstly, two items of

Table 3. Aspects for Assessing Loan Applications.

Items	Rank and Frequencies of Ranking						
	1st	2nd	3rd	4th	5th	6th	7th
Security of bank loan	9	3	2	5	1	Nil	1
Financial stability	3	7	5	4	Nil	2	Nil
Profitability	8	5	4	1	2	Nil	1
Liquidity	Nil	3	7	6	5	Nil	Nil
Consistency of trends	Nil	Nil	2	3	6	5	5
Generation of employment	1	Nil	1	1	3	9	6
Generation of export earnings	Nil	4	Nil	1	3	6	7

Table 4. Types of Information Used in Credit Evaluation.

Informational Items	Value Label and Frequencies	
	Yes	No
Financial and economic information		
Profitability	17	4
Security	14	7
Gearing	2	19
Return on capital	14	7
Creation of employment	7	14
Foreign exchange earnings	9	12
Non-financial		
Repaying ability	16	5
Managerial ability	12	9
Reputation of the borrower	13	8
Personal contact	3	18
Business track record	12	9
Borrower is an existing customer of the financier	8	13

accounting information appear significant to the lending model used, namely profitability and security. Lenders also consider the concept of return on the capital invested into the project as important, with 14 lending companies stating that they used it in evaluating credit proposals. This may tend to reinforce views on the importance of profitability. Secondly, only one third of the lending companies reported that creation of employment opportunities and earning foreign exchange were used in credit evaluation (supporting the results of Table 3). Thirdly, the popular types of qualitative information indicated in Table 4 indicate that loan officers seem to be inclined towards existing customers, small-firm owners or existing business in general. A great deal of the qualitative information on which they reported that they relied could not normally be obtained, except from an existing small-firm owner or an existing customer (of that specific lending company or another). Fourthly, lenders appear not to give much importance to gearing. Two possible explanations are suggested. Firstly, lenders may have a broad range of acceptable ratios for debt-equity, so that most applications are acceptable with respect to this criterion; consequently, they do not consider it as important information in the evaluation of credit proposals. Secondly, since gearing attempts to measure risks, lenders may use other criteria or variables to assess risk (and which thus proxy for gearing), such as variables relating to the personal characteristics of the borrower, security or general economic feasibility. However, from the lenders' interviews, reviews of specimen copies of loan application forms and the interviews with small-firm owners, it has been observed that flexibility and openness in dealing with the debt-equity is not really to be expected. These data sources, especially interviews with small-firm owners, suggest that normally the debt portion of project or firm financing would not be expected to go beyond 60% of the total capital required. Personal contact was indicated by only three lending companies as being used in credit evaluation, supporting the results regarding this variable in Table 4: Lending companies in general do not appear to consider it important information in dealing with loan proposals. However, this contradicts the views expressed by small-firm owners; 58 (76%) of them stated that they felt that personal contact did play a significant role in lending decisions. This may indicate a fundamental misconception by each side of the lending decision of the other's behaviour, an easy focus for frustration by small-firm owners, or a wish to appear objective by lenders.

The above empirical findings indicate that lending companies place, at least officially, a great deal of emphasis on accounting information, i.e., financial feasibility. Transaction-based lending seems to dominate the behaviour of lenders in Bangladesh whilst, at the same time, personal contact with the borrower and referees' recommendations also receive a great deal of consideration in favour of granting loans. The relationship with the lenders is perceived by small-firm owners to be instrumental for the approval of loans. However, this relationship is often arbitrary and led by the covert motives of lenders. Thus, many aspects of lending companies' formal structures, policies and regulations have been shaped to accord with the personal expectations of influential external constituents (DiMaggio & Powell, 1983; Meyer & Rowan, 1977) rather than being dictated by an established lending framework. As a consequence, the formal design of lending procedures, which on the surface are textbook models of rational lending, have been reduced to ritualistic roles within the lending companies, with the personal gain of major players outside and inside the institutions being the primary purpose (Uddin & Khan, 2004). Such lending policies, coupled with arbitrary covert motives and personal interventions, have rendered the transaction-based lending systems ineffective for both the lending companies and the borrowers involved. The frustrations this engenders, the culture it creates and the transformation of lending procedures into ceremonial, ritualistic or legitimatory systems may well be similar to the contexts found in other less-developed countries (Uddin & Hopper, 2001; Uddin & Tsamenyi, 2005).

This paper also points out to dissimilarities in lending practices between Bangladesh and Western countries, which are as follows: In Bangladesh, the lending process starts too late. For example, in most cases, the initial contact is made by the borrower and is a very unpleasant experience, as interviews with small-firm owners revealed (Uddin & Khan, 2004). Lending practices in the UK and USA suggest that lending companies take initiatives to contact prospective borrowers, especially the owners of small firms (Berry et al., 1991, 1993; Bryce, 1960). The lending process also ends too early in Bangladesh. For example, the follow-up stage of the loan is absent in almost all the lending companies, as revealed in the interviews. Evidence suggests that lenders do not make use of loan-contracting procedures that are efficient in giving effective support for the borrower to ensure a reasonable chance of economic success for the loan. For the economic success of small firms, effective support may come in the form of counselling and advice in areas such as finance and marketing, or through the use of financial covenants and monitoring to identify problems early. Furthermore, lenders do not practice loan-monitoring procedures either in the context of formal loan contracts or informally. The fieldwork indicates that monitoring by lenders is not generally practiced as a formal part of the contractual agreement between the borrower and the lender. There is evidence of some informal monitoring provided by loan officers, but overall the level of monitoring is much less than expected by borrowers as a prerequisite for the effective running and development of their firms.

7. CONCLUDING REMARKS

The paper concludes by considering the research questions set out earlier, namely, how do lending companies take lending decisions, does accounting play any role and can lending decisions in less-developed countries be modelled. Fig. 2 summarises the findings of this paper with respect to these questions.

The major difference between Figs. 1 and 2 is the distinction between ceremonial/idealised in Fig. 1 and actual lending model in Fig. 2. This is introduced because of scepticism concerning whether ceremonial/idealised models of lending described in the literature ever operate as intended.

The basic argument underlying Fig. 2 is that lending models adopted by the lending companies are shaped by a series of contextual factors, such as economic and culture. Accounting, to a large extent, plays a legitimising role in lending as opposed to the major role described in the idealised model.

The lending companies follow (on paper) some formal procedures for lending to small firms, i.e., submission of loan applications forms, and consideration of various types of information, such as accounting and qualitative/non-accounting information. It is apparent that formal lending models rely more on hard published information than soft information. However, the question was whether this formal model only plays a

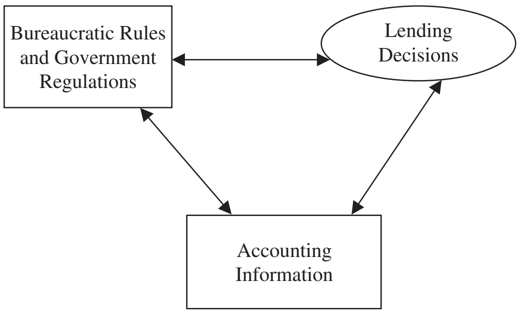

Fig. 1. Ideal Lending Process and Accounting Information.

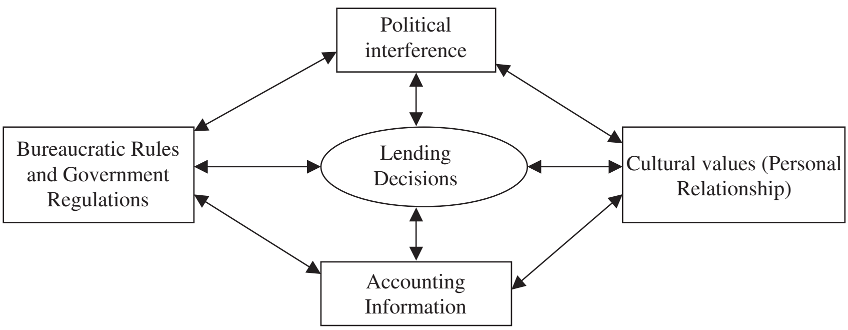

Fig. 2. Actual Lending Process and Accounting Information.

legitimising role. A number of information sources, procedures and criteria which are recognized as part of best practice were present, but significant doubts remain about how far they are applied in practice and how far they contribute to effective lending.

The tables presented earlier show that lenders officially place a great deal of emphasis on accounting information. Two items of accounting information, namely profitability and security, appear significant to the lenders, according to the questionnaire survey. The interviews with and questionnaire survey of the small-firm owners indicate that lenders lay emphasis on informal factors such as personal relationships with lenders or bank officers and a good reference/advice from influential persons. The authors have sympathy with the views of small-firm owners simply because lenders in Bangladesh and other less-developed countries would find it difficult to rely on hard financial information when this is hardly available, even in big companies (Uddin & Hopper, 2001). Previous studies on transparency revealed that many big companies do not even comply with the disclosure requirements (Abu-Nassar & Rutherford, 1996; Ahmed & Nicholls, 1994).

Lending decisions, as discussed earlier, are influenced by personal influence, which ultimately leads to reduced accountability in monitoring and recovery of the loans, and investment in bad projects. Socio-economic and cultural factors play a significant role in giving rise to such informal and personalized lending practices (Uddin & Khan, 2004). This may point a finger towards a number of serious issues. Firstly, imperfections in the capital market in less-developed countries may also contribute significantly to the failure of small firms to meet the development objectives set for them. Developed capital markets are perceived to be an essential condition for lenders to act objectively (Berry et al., 1991, 1993). However, there are certain pre-conditions that need to be in place for an efficient market and which are often found in developed countries. These may include independent judicial systems, relatively independent accounting profession, transparent corporate governance, etc. These conditions are often lacking in less-developed countries, including Bangladesh, as previous research has revealed (Dyball & Valcarcel, 1999; Uddin & Hopper, 1999, 2001; Yapa, 1999). Secondly, previous research on accountability and control in less developed countries, especially Bangladesh, has revealed that political leaders exploit their control over public and private enterprises to their personal ends. The furtherance of political interests rather than commercial criteria has become the norms of many organizations, including the lending companies (Uddin & Hopper, 1999, 2001). Not surprisingly, the objective model of lending supported by accounting information has become de-coupled.

The official lending model is followed according to official rules and procedures to give the appearance of rational governance to provide external legitimacy, though it is widely known that their unreality and marginality to decisions meant they played little role in accountability.

Lastly, the vital role of lending companies in development is well accepted and agreed by all concerned in Bangladesh (Uddin & Khan, 2004; World Bank, 1978). This paper calls for lenders to adopt a relatively wider spectrum so that they are not mere lenders of money but organisations showing timely and effective responsiveness to the crucial clientele group of small firms. However, there is a strong need for more in-depth research on this very important but neglected area, in particular to developing an appropriate atmosphere of lending to small firms.

NOTES

1. Small industry means an industrial undertaking engaged either in manufacturing process or service activity whose total fixed investment excluding the prices of the land, expenses for inland transportation and commissioning of machinery appliances and duties and taxes is limited to taka three crore, i.e., Tk. 30 million (including initial working capital). In the case of BMRE, even if the total investment limit exceeds Tk. 30 million, it would still be considered as a small industry. However, the extent of extended investment for BMRE shall not be more than 50% of the total investment' (Industrial Policy 1991, a GOB publication).
2. The paper, somewhat narrowly, defines accounting information as information which indicates the financial positions of the enterprises/firms.
3. A copy of the questionnaire can be produced on request.
4. Loan officials are those who are closely related to the appraisal, screening and selection of proposals for lending to small firms.
5. For the purpose of this research, we will use lending companies, lending companies and lending companies interchangeably to refer to all lending companies covered by the fieldwork, including the MIDAS. Hence, the sample size of such institutions was approximately 100% and the term "approximately" is used because some foreign banks were excluded from the sample. This was not because of their inaccessibility but rather due to the structure of their portfolio of loan investments.
6. One senior executive of a lending company reported that they had used a *Bank's Manual* in dealing with lending. This manual was described as comprising 'compact appraisal' methodology that included several studies and examples of analyses. The other institutions did not mention using such a manual, but they reported that the practice of appraisal procedures comprised the above. The institution which did not report having a standard lending procedure was not in an absolutely isolated position, however. In practice, although it did not have any concrete lending procedures to follow, it reported that it adopted aspects of the above-mentioned types of analysis when necessary.

7. Lenders consider a range of factors with relation to management skills, including entrepreneurs' educational and business records; previous experience in any business; consideration of conceptual knowledge in business or related fields; consideration of personal attitude and behavioural patterns of the borrower as far as the proposed project is concerned; and analysis of repaying attitude and risk taking ability.

8. Assessing and ascertaining actual demand for the product or service; examining the possibility of expansion of the applicant firm's present capacity of production; examining marketing strategy, viz., local sales, export, wholesale or retailing; analysing the appropriate pricing of products or services; and considering relevant factors such as the price of similar products on the market.

9. Mahajans are typical money lenders found in the villages of Bangladesh, who lend money to villagers against security with high interest and do not listen to the problems of the borrower, and require the borrower to pay accrued interests and principal when due or confiscate the property given as security.

10. This bureau was established in December 1992, under the direct supervision of the Central Bank of Bangladesh and collects information on the credit standing of firms through lenders to firms and projects.

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QUARTERLY FINANCIAL REPORTING: A SURVEY OF MALAYSIAN USERS AND PREPARERS

Ku Nor Izah Ku Ismail and Roy Chandler

ABSTRACT

This paper is the result of an investigation into quarterly financial reporting in Malaysia. Although there is general support for frequent financial reporting, users would prefer to see more detailed disclosure, shorter delays and more auditor involvement in the publication of quarterly reports. Our findings provide input to policymakers reviewing the effectiveness of recent regulatory initiatives as well as informing debate on future regulations and opening up avenues for future research on quarterly reporting.

1. INTRODUCTION

Various stock exchanges have introduced interim financial reporting (i.e. other than annual reporting) to improve capital market efficiency. The former international accounting regulator, the International Accounting Standards Committee (IASC), argued that interim reports improve the

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accuracy of forecasts of earnings and share prices (IASC, 1998) with some justification (Abdel-Khalik & Espejo, 1978; Allen, Cho, & Jung, 1999).

The Asian financial crisis of 1997/98 exposed some of the weaknesses of the existing regulatory framework, including lack of disclosure and transparency (Rahman, 1998). Capulong, Edwards, Webb, and Zhuang (2000) argued that more timely information would enhance investors' confidence in the capital market, reduce uncertainties and help improve users' decisions.

In March 1999, the Kuala Lumpur Stock Exchange (KLSE)[1] introduced mandatory quarterly reporting for public listed companies. Under the new regime, quarterly reports are to be made available within *two* months of the quarter-end. The Malaysian Accounting Standards Board (MASB) issued *Draft Statement of Principle (DSOP) 4*, *Interim Financial Reporting*, to assist preparers on the issues of recognition and measurement in quarterly reports. In 2002, *MASB 26, Interim Financial Reporting*, essentially an adoption of *IAS 34*, *Interim Financial Reporting*, was issued.

The introduction of more frequent reporting met with little resistance from the companies which would have to prepare the reports and have to bear the costs. This passive acceptance must be viewed against the background of the Asian financial crisis and Malaysian culture, typified as 'low masculinity' and 'high power distance'[2] (Azham, 1999; Haniffa & Cooke, 2002).

This study addresses both users and preparers of quarterly reports since each group has its own perspective (Carnegie, 1990). An expectation gap is said to exist between the information users desire and the information the companies disclose (Baker & Haslem, 1973; Buzby, 1974; Kahl & Belkaoui, 1981; McNally, Lee, & Hasseldine, 1982). Our aim was to test whether this gap existed in the context of a country that had recently introduced a new tranche of corporate reporting.

The rest of the paper is organised as follows. Section 2 will review previous studies associated with the issues surrounding interim financial reporting. Section 3 discusses the research methods adopted in carrying out this study. The findings of the study are presented in Section 4 and the paper ends with our conclusions.

2. LITERATURE REVIEW

One of the dilemmas facing those concerned with regulating and producing information is the trade-off between timeliness and reliability. We use these two qualities to organise the following brief literature review, looking first at timeliness.

2.1. Timeliness

Timeliness is clearly one of the key characteristics of useful information. There are two aspects of timeliness where financial reporting is concerned. One refers to the frequency of the reports and the other refers to the delay from the end of the reporting period to the date of the report's release, often referred to as the 'reporting lag'. Botosan and Harris (2000) argue that frequent disclosure reduces information asymmetries, transaction costs and the cost of equity capital.

In the US, the American Institute of Certified Public Accountants (1991) argued that quarterly reporting is consistent with users' needs for updated information, provides for an orderly dissemination of reliable information and reduces the problems of trading on inside information. US financial analysts have shown persistent support for quarterly reporting (see Barton, Carper, & O'Connor, 1979). In the UK and Ireland, half-yearly reporting has long been accepted (see Holmes, 1971; Institute of Chartered Accountants in Ireland, 1992; Lunt, 1982). In Australia, Carnegie (1990) found support from users for quarterly reporting while preparers preferred half-yearly reporting.

Opponents argue that more frequent reporting imposes an unnecessary burden on companies, introduces greater estimation problems (Reilly, Morgenson, & West, 1972) and exacerbates the 'short-termist' focus of the typical investor.

Views vary concerning the reporting lag that should be acceptable for interim reporting. In the US, companies have been required to issue quarterly reports within 45 days from the period-end. However, as part of the Sarbanes-Oxley Act 2002, the SEC in August 2002 required companies with public stock values in excess of US$75 million to file their quarterly reports within 35 days of the quarter-end. In the UK, the London Stock Exchange allows companies to issue the half-yearly reports within 90 days.

2.2. Reliability

The Financial Accounting Standards Board (FASB), in its *Statement of Financial Accounting Concepts No. 2* (FASB, 1980) defined reliability as "the quality of information that assures that information is reasonably free from error and bias and faithfully represents what it purports to represent" (p. xvi). The reliability of unaudited reports has always been a central issue, raising doubts about the risk of accounting errors and the practice of earnings management. Kinney and McDaniel (1989) suggested that reports in the fourth quarter might include corrections of previous errors in reported interim earnings to be consistent with the annual audited financial statements. Givoly and Ronen (1981) argued that the first three quarterly reports in a year are less reliable than the year end annual report because the former are more susceptible to random fluctuations, incorporate a seasonal element and are not audited.

However, as with annual reports, there is a trade-off between reliability and timeliness. The audit process adds reliability but takes time. This argument thus leads to the issue of whether external or internal auditors should be involved, the extent of their involvement with the process and the timing of their involvement.

Auditor involvement can take several forms, ranging from full audit to no involvement at all. In the US, there is an established tradition of auditor involvement with quarterly reports. In the UK, the Cadbury Committee (1992) suggested that external auditors review the interim reports. Subsequently, the Auditing Practices Board (APB) issued a series of non-mandatory bulletins, the most recent one being *APB Bulletin 1999/4*, *Review of Interim Financial Information*. In Malaysia, there is no requirement for auditor involvement in preparing quarterly reports.

Several studies have sought respondents' views on the issues of reliability and auditor involvement. Malloy, Sale, and Willis (1975) revealed that analysts found quarterly reports less credible compared to the annual reports. The respondents believed that management massaged reported earnings by deferring material adjustments until the fourth quarter. However, analysts showed little support for a requirement that quarterly reports be audited. In another study, Nickerson, Pointer, and Strawser (1975) revealed that preparers agreed with the idea of no auditor involvement. Reckers and Pany (1979) found that users of quarterly reports placed greater reliance on statements that had been subjected to an audit as opposed to a limited review. The respondents expressed low confidence for statements with no auditor involvement.

In the UK, Lunt (1982) found little support for quarterly reports which, without an audit, were considered to be unreliable. Users supported the idea of limited auditor involvement, but not at the cost of delaying the release of the information. Similar results emerge from Carnegie (1990) in an Australian context.

3. METHODOLOGY

We surveyed fund managers, financial analysts and other intermediaries as the target respondents for several reasons. First, these 'professional' investors act for entities that hold substantial amounts of stock in most publicly traded companies. Second, these sorts of investors have expressed an interest in interim reporting since the 1930s (Association for Investment Management and Research, 1992; Taylor, 1965). Third, their work requires that they have sufficient accounting knowledge to enable them to analyse the reports and to make investment decisions. Fourth, the opinions and actions of these professional investors have a significant influence on other investors (for example, according to Anderson & Epstein, 1996, private investors regard advice from professional intermediaries as the most important source of information).

In addition, we also sought the views of chief financial officers (CFOs) of KLSE public listed firms since they are ultimately responsible for the preparation of the financial reports, both annual and interim.

3.1. Data Collection

As at the end of 2001, we identified 223 professional investor organisations in Malaysia. A pre-survey letter was sent to the divisional heads of research (in stock-broking and investment advisory firms) and of fund managers (in unit trust companies, fund management companies and large public fund organisations) through an e-mail or by post. In this pre-survey exercise, recipients were requested to give the name(s) of analysts and/or fund managers who would be willing to participate in the survey. Of the 223 organisations contacted, 23 replied nominating a total of 46 individuals to be contacted. Questionnaires were sent personally to the 46 individuals identified.

Of the 200 non-respondents, seven companies that were discovered to have moved to unknown addresses or to have ceased trading were excluded. Three questionnaires were mailed to the heads of analysts and the heads of fund managers in the remaining 193 companies. The questionnaires were to be distributed among their fellow analysts or fund managers. Thus, a total of 625 questionnaires were distributed. Of the 94 questionnaires returned from 62 organisations, 90 (14.4 percent) were usable.

The sampling frame for the preparers consists of the CFOs of companies quoted when the requirement for quarterly reporting came into effect in 1999. These companies were chosen to ensure that companies had been preparing the half-yearly reports before the transition to quarterly reporting occurred. These CFOs were assumed to have sufficient experience of both half-yearly and quarterly reporting to form a considered view of the issues surrounding interim reporting.

There were 757 companies listed on the KLSE as at the end of 1999. However, addresses for only 714 could be found on the KLSE website (http://www.klse.com.my). Questionnaires were sent to the CFO in each of these 714 companies. One hundred and eleven returns (15.5 percent) were received; five incomplete responses reduced the useable replies to 106 (14.8 percent).

These response rates from users and preparers are within a range considered to be normal for such surveys (Ho & Wong, 2001; PricewaterhouseCoopers, 2002).

3.2. Detecting Non-response Bias

A low response rate might give rise to a problem of non-response bias that might cause the data to be unreliable or invalid. Accordingly, an effort was made to test for non-response bias. Following Oppenheim's (1966, p. 34) suggestion, we tested the first 30 questionnaires received against the last 30. An analysis of *t*-test results revealed no statistically significant differences indicating little or no non-response bias.

4. RESULTS

We now present the results of the survey looking first at the issue of timeliness of reporting.

4.1. Timeliness of Reporting

Table 1 presents the results of users' and preparers' preferences for the frequency of reporting. It shows that most users (72.2 percent) prefer quarterly reporting. Fourteen users (15.5 percent) prefer a less frequent reporting while nine of them (10.0 percent) would prefer monthly reporting. This means that generally users support the quarterly reporting basis, a finding consistent with earlier evidence from the US (Barton et al., 1979) but not in the UK (Lunt, 1982).

Less support for quarterly reports was found among preparers with 50% being in favour of either traditional six-monthly or the more novel tri-annual reporting.

The results of the chi-square test show that this difference between users' and preparers' preferences is significant but not unexpected. Given the choice, users will naturally prefer the opportunity of receiving more

Table 1. Preferences for Frequency of Reporting.

	Users		Preparers		Chi Sq.[a]
	Freq.	%	Freq.	%	Sig.
Monthly basis	9	10.0	0	0.0	
Quarterly basis	65	72.2	54	50.9	
Tri-annually basis	2	2.2	7	6.6	
Half-yearly basis	12	13.3	45	42.5	0.000**
Missing opinion	2	2.2	0	0.0	
Total	90	100.0	106	100.0	

**Significant at 1 percent

[a]Since the chi-square test requires that cells must have at least five observations, the frequency of reporting is regrouped as follows: (i) monthly and quarterly basis and (ii) tri-annually and half-yearly.

Table 2. Preference for Allowable Reporting Lag of QFRs.

	Users		Preparers		Chi-Sq.[a]
	Freq.	%	Freq.	%	Sig.
3 weeks	29	32.2	0	0.0	
30 days	42	46.7	6	5.7	
45 days	8	8.9	16	15.1	
60 days	9	10.0	66	62.3	
75 days	0	0.0	10	9.4	0.000**
90 days	0	0.0	8	7.5	
Missing opinion	2	2.2	0	0.0	
Total	90	100.0	106	100.0	

**Significant at 1 percent.

[a]Since the Chi-square test requires that cells must have at least five observations, the reporting lags are regrouped as follows: (i) 3 weeks and 30 days, (ii) 45 days, and (iii) 60–90 days.

information, especially if they bear no direct cost (it is the preparers who bear the cost and who tend to be less enthusiastic about the prospect of providing more information).

4.2. Reporting Lag

A similar pattern emerges in users' and preparers' views on acceptable reporting lag. As Table 2 shows, a majority of users prefer quarterly reports to be issued well within the current time limit of 60 days. Twenty-nine of them (32.2 percent) expect the quarterly reports to be reported as early as 3 weeks after the quarter-end and 42 of them (46.7 percent) indicated a reporting lag of not more than 30 days. Only nine users (10.0 percent) support the current requirement of 60 days. No users signalled a preference for an extension to the 60 day period.

In contrast, a majority of the preparers (62.3 percent) supports the current allowable period of 60 days, although 15.1 and 5.7 percent of them would prefer 45 and 30 days, respectively. The remaining 16.9 percent of preparers would like to be given longer than 60 days to produce the reports. The chi-square test indicates that the difference between the perceptions of users and preparers is significant.

Comments made by four users and preparers in the open-ended questions may give some insights into the issue of reporting lags. Four of the users stated that 60 days is too long. Three of them suggested that some companies deliberately take the maximum allowable time. On the other hand, one financial manager stated that the current deadline of 60 days is very tight and leaves little time for management, auditors and audit committee to review the statements in detail. Another financial manager suggested that information released within 60 days may not be complete or in sufficient detail, a problem that is particularly serious for companies with a large number of subsidiaries and associated companies.

The above findings may have some implications for the future development of the regulation of quarterly financial reporting in Malaysia. The findings provide a basis for the regulators, such as the KLSE and the Securities Commission of Malaysia (SC) to consider reducing the allowable reporting lag in the future. In view of the decision of US regulators to reduce the quarterly reporting lag to 35 days, and Singapore's recently introduced requirement of 45 days (KPMG, 2002), we should not be surprised if Malaysian regulators come under pressure to impose similarly tight deadlines on KLSE-listed companies.

4.3. Disclosure

The KLSE requires companies' quarterly reports to include income statement, balance sheet, cash flow statement and a statement showing changes in equity and explanatory notes. We asked users and preparers for their views on the contents of quarterly reports. Table 3 shows that there is a significant difference in opinion between users and preparers on this issue.

Table 3. Preferences for Content of Quarterly Reports.

Preferences	Users		Preparers		Chi sq.[a]
	Freq.	%	Freq.	%	Sig.
Comprehensive as in corporate annual reports	14	15.6	1	0.9	
More than is currently required but to a lesser degree compared to the annual report	47	52.2	9	8.5	
As it is now, as prescribed by the KLSE	26	28.9	80	75.5	
Less information than is currently required	0	0.0	10	9.4	
Some currently required information should not be disclosed while some other information should be disclosed	2	2.2	6	5.7	0.000**
Missing opinion	1	1.1	0	0.0	
Total	90	100.0	106	100.0	

**Significant at 1 percent.
[a]Since the Chi-square test requires that cells must have at least five observations, the content of quarterly reports is regrouped as follows: (i) comprehensive and more than current requirements and (ii) as it is now or less comprehensive.

Whereas a majority of users (67.8 percent) prefers a more comprehensive report, a majority of the preparers (75.5 percent) are content with the current requirement as prescribed by the KLSE. The results of the chi-square test show that their preferences differ at a 1 percent significance level. The findings are consistent with the literature that suggests that management is reluctant to disclose more because of the fear of increasing the costs of preparing the additional information and forfeiting some competitive advantage.

Respondents' views were also sought on the inclusion of four items of additional disclosure: a cash flow statement, a statement of changes in equity, cost of sales and earnings forecasts. The mean scores (based on a Likert scale of 1 ('strongly disagree') to 5 ('strongly agree')) indicate that users 'agree' that the four additional information items are needed, while preparers in general 'disagree'. The difference in views is significant at the 1 percent level.

The findings support the previous result that users are looking for more information while a majority of preparers are content with the current requirements of quarterly reporting (Table 4). Preparers appear not to be supportive of the additional requirements imposed by the MASB and the requirement for an earnings forecast. Again, the findings support the literature that the extra cost needed to prepare quarterly reports may lead to differing perceptions between users and preparers. PricewaterhouseCoopers

Table 4. Beliefs Regarding Additional Disclosure in QFRs.

Beliefs	Mean		M–W test
	Users	Preparers	Sig.
Quarterly financial reports (QFRs) should include a cash flow statement	4.22	2.36	0.000**
QFRs should include a statement of changes in equity	3.96	2.49	0.000**
QFRs should include earnings forecasts	4.12	2.02	0.000**
QFRs should include cost of sales	4.13	2.70	0.000**

**Significant at 1 percent.

Table 5. Preferences for Auditor Involvement.

	Users		Preparers		Chi-Sq.[a]
	Freq.	%	Freq.	%	Sig.
Full audit similar to annual audit	11	12.2	2	1.9	
Partial audit involving the verification of only material items	54	60.0	12	11.3	
Limited review involving no detailed testing of supporting data	2	2.2	33	31.1	
Management discusses interim results with auditors. No examination of underlying figures undertaken by auditors	10	11.1	38	35.9	0.000**
No external auditor involvement necessary	11	12.2	21	19.8	
Missing opinion	2	2.2	0	0.0	
Total	90	100.0	106	100.0	

**Significant at 1 percent.
[a]Since the Chi-square test requires that cells must have at least five observations, the extent of auditor involvement is regrouped as follows: (i) full and partial audit, (ii) limited review and management discussion and (iii) no auditor involvement.

(2002) report that 26 percent of KLSE-listed companies had to recruit additional staff following the recent increase in disclosure requirements.

4.4. Auditor Involvement

Users generally prefer some kind of auditor involvement in quarterly reporting. Table 5 gives the details. Eleven of them (12.2 percent) are in favour of a full audit, while an identical number prefer no auditor involvement. The majority, 54 (60.0 percent), prefers partial auditing. This suggests users generally may have doubts about the reliability of unaudited quarterly reports. One investor remarked: "sometimes quarterly reports are subject to amendments because no audit is required. Hence, audits should be imposed".

However, users' preference for auditor involvement is not shared by preparers. Although a majority of preparers (about 80 percent) prefer some kind of auditor involvement, they were less responsive to the idea of full or even a partial audit. Only 1.9 percent and 11.3 percent of them were in favour of a full audit and a partial audit, respectively. About 31 percent preferred a limited review and 35.8 percent preferred management discussion with the auditor. The remaining 19.8 percent feel that no external audit involvement is necessary. The chi-square test result shows that this difference in perceptions between users and preparers is significant.

4.5. Reliability

On a five-point Likert scale ranging from 1 to 5 (from 'not reliable at all' to 'extremely reliable'), respondents indicated their confidence about the reliability of quarterly reports as depicted in Table 6. Both groups regard the fourth quarter's reports as the most reliable. This is followed by reports of the third, second and first quarters, which lie between 'undecided' and 'reasonably reliable'. Our findings support the argument of Givoly and Ronen (1981) that quarterly reports are less reliable than the annual reports because the former are more susceptible to random fluctuation, incorporate a seasonal element and are not audited.

It is also interesting to find that users and preparers rank the quarterly reports in ascending order of reliability. One possible explanation is that judgement in making estimates improves as the year goes on. Any deficiencies

Table 6. Perceptions of the Reliability of Quarterly Reports.

	Users			Preparers			M–W
	Mean	Rank	Sig. (between quarters)	Mean	Rank	Sig. (between quarters)	Sig. (between groups)
First quarter	3.34	4		3.79	4		0.000**
Second quarter	3.64	3	0.000**	3.92	3	0.002**	0.002**
Third quarter	3.73	2		3.96	2		0.007**
Fourth quarter	4.07	1	0.146 0.000**	4.48	1	0.351 0.000**	0.000**

**Significant at 1 percent.

Table 7. Users' and Preparers' Beliefs Regarding the Effect of Auditors' and Audit Committees' Involvement on Reliability.

Beliefs	Mean		M–W test
	Users	Preparers	Sig.
The involvement of internal auditors with QFRs would improve the reliability of the reports	3.87	3.05	0.000**
The involvement of audit committees in reviewing the QFRs would improve the reliability of the reports	3.91	3.89	0.706
The involvement of external auditors with QFRs would improve the reliability of the reports	4.02	3.56	0.001**

**Significant at 1 percent.

reported in the earlier quarter(s) will be adjusted in the following quarter(s) (Reilly et al., 1972).

For all quarters, preparers perceive that their quarterly reports are more reliable than the users perceive them to be. Results of the Mann–Whitney tests indicate that the perceptions between users and preparers are significant at the 1 percent level. The results imply that preparers feel more confident about the reliability of all their quarterly reports than do the users. Users are more sceptical about the reliability of quarterly reports, and would prefer some auditor involvement in the process.

In another section of the questionnaire, respondents were also asked directly the effect of auditors' and audit committees' involvement on the reliability of the reports. Their answers are based on a Likert scale of 1 ('strongly disagree') to 5 ('strongly agree') and, as summarised in Table 7, show that users believe that the involvement of internal auditors, external auditors and audit committees with quarterly reporting will improve the reliability of the reports.

Generally, preparers also tend to concede that audit committees and external auditors improve the reliability of quarterly reporting, but were 'undecided' about the effect of internal auditors on reliability. The findings suggest that preparers themselves had some doubts about the reliability of quarterly reports. Results of Mann–Whitney tests show that the perceptions of users and preparers differ where the internal and external auditors are concerned, but do not differ where the audit committees are concerned. As might be expected, users are more strongly in favour of some involvement by external and internal auditors to improve the reliability of quarterly reporting.

5. CONCLUSION

Our study provides evidence that users and preparers differ in their opinions on most of the issues regarding quarterly reporting. There appears to be little consensus between users and preparers where timeliness, content, auditor involvement and reliability of quarterly reporting are concerned. With respect to the frequency of reporting, a majority of users are satisfied with the current frequency of reporting (quarterly basis), but preparers are more likely to favour a less frequent basis of reporting. Preparers' reluctance to embrace quarterly reporting may be due to the additional costs incurred in preparing the reports and loss of competitive advantage. In terms of the speed of issuing quarterly reports, a majority of users favour a 30-day time lag, while preparers are content with the current regulation of 60 days. Users wish to see more information in the reports; however, a majority of preparers are satisfied with the current content of the quarterly reports as prescribed under the *KLSE Listing Requirements*. Again, cost, competitive disadvantage and time constraints are the likely factors that contribute to preparers' reluctance to reveal more information.

On the issue of auditor involvement, a majority of preparers agree that management should at least discuss the quarterly results with the auditors. A majority of users, however, desire a higher level of auditor involvement, that is, to have the quarterly reports at least reviewed by auditors. With respect to reliability, both users and preparers express the view that quarterly reports are reliable, although users expressed a lower level of confidence. This may explain why users would prefer a higher level of auditor involvement. There is also evidence that the first three quarterly reports are perceived to be less reliable than the fourth quarter's reports. This finding confirms the existing literature.

It should be realised that the costs incurred by companies to have full, prompt and audited quarterly reports are ultimately borne by the investors. However, in our questionnaire, users were not reminded of the notion of who would ultimately bear the costs. The question of whether their opinions would differ if they had to bear the cost remains unanswered.

The introduction of mandatory quarterly reporting in Malaysia was part of the regulatory response to the financial crisis that hit Asian markets during the late 1990s. Time will tell whether such measures prove sufficient to prevent another unexpected downturn in the market. In the meantime, the evidence presented here should inform regulators and policymakers in jurisdictions that have yet to introduce quarterly reporting or implement IAS 34. Before advocating a more stringent reporting regime, we need to see further research into the costs and benefits of the changes recently introduced in the US and Singapore.

NOTES

1. Currently known as Bursa Malaysia.
2. As suggested by Hofstede (1991) in Haniffa and Cooke (2002), low masculinity was characterised by values such as being considerate, caring and preserving 'face', while high power distance was evidenced by values such as respect for others, acceptance of social rank and loyalty to the ruler.

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POST-COLONIAL ACCOUNTING DEVELOPMENT AND THE NEXUS OF DOMESTIC–GLOBAL INTERESTS IN EMERGING ECONOMIES

Shahrokh M. Saudagaran and Joselito Diga

ABSTRACT

We analyze the development of modern accounting institutions during the post-colonial period of five member countries of the Association of South East Asian Nations (ASEAN). We study national and international factors that influence the development of accounting in ASEAN, including the link between First World geo-political and economic imperatives and domestic conditions. The paper examines the interaction between the state, market, community and profession to provide a stronger basis for understanding accounting regulation within ASEAN. It shows how accounting systems inherited from the colonial era have been reproduced and maintained in the post-colonial era. We explicitly identify the transnational context in which ASEAN countries are located, thus providing a broader understanding of accounting in a domestic–international juncture. We believe, it is worthwhile to expand the scope of comparative international accounting research to consider a wider array of emerging

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economies, about many of which relatively little is known in an accounting sense.

1. INTRODUCTION

The various functional roles of accounting within the economy have been well recognized in both national and international accounting literature (Willmott, 1986). However, functionalist accounts often ignore the role of accounting in historically specific contexts and in relation to diverse socio-political and economic circumstances. Much of the literature described as comparative international accounting research[1] presupposes a somewhat homogeneous and a historical role for accounting in diverse national settings. Measurement and disclosure concepts and practices that differ across countries are viewed merely as adjustments to reflect what is perceived to be useful information in these societies. There is little recognition that such information may be conditioned by particular sets of material socio-cultural and ideological forces that emanate from both the nation state and the international context (Puxty, Willmott, Cooper, & Lowe, 1987).

Our paper analyzes the development of modern accounting institutions and practices during the post-colonial period of five countries in Southeast Asia. The countries examined here (Indonesia, Malaysia, Philippines, Singapore and Thailand) are members of a regional politico-economic group, the Association of South East Asian Nations (ASEAN), that came in the global spotlight during the 1997 Asian economic crisis.[2] We seek to study the various national and international factors that influence the development of accounting regulation and the accounting and auditing profession in ASEAN. The link between First World geo-political and economic imperatives (manifested through colonization and post-colonial economic dependency), and domestic conditions within ASEAN countries is examined.

The analysis in our paper draws inspiration from prior research that has exposed the role of accounting in legitimating existing bases of social exchange and the uneven distribution of power in societies (Richardson, 1987). The paper uses concepts developed in the neo-corporatist analysis of the accounting profession, particularly in an international context (Puxty et al., 1987; Willmott, Robson, Cooper, & Lowe, 1992). It aims to show how a better appreciation of the interaction between the state, market, community, and profession can provide a strong basis for understanding the 'professionalization' of accountants and accounting regulation within ASEAN.

Overtly, each ASEAN country has a set of accounting regimes that resemble, to varying degrees, those existing in Western industrialized countries. This feature of their accounting systems has, with the exception of Thailand, been attributed to each country's colonial history, e.g., Indonesia's Dutch accounting system, the Philippines' US-based accounting system, and British-oriented accounting in Malaysia and Singapore. Besides being simplistic and unsatisfactory in the light of shifting patterns of each country's post-colonial political economy, these explanations beg the question of how a foreign accounting system, emanating from the countries with significantly different historical backgrounds, have come to dominate the accounting thought and practices in ASEAN countries. The persistence and expansion of these borrowed accounting systems is even more intriguing since these countries experienced periods of strong nationalism, where practices associated with the previous colonial order were questioned and, often spurned (Osborne, 1995). One of the aims of this paper is to show how accounting systems, inherited from the colonial era, have been reproduced and maintained in the post-colonial era.

Our paper also explicitly identifies the transnational context in which ASEAN countries are located, thus bringing in a broader understanding of accounting in a domestic–international juncture. We believe, it is worthwhile to expand the scope of comparative international accounting research to consider countries with emerging markets, about many of which relatively little is known in an accounting sense. Such research can help provide a better understanding of the roles and forms of accounting in countries other than advanced Western industrialized ones.

As a background to the analysis, several recurrent themes characterizing the development of accounting in ASEAN are highlighted here. First, in each country, a nascent local accounting profession emerged during a period when nationalist sentiments were at their height. Contradictions were apparent, however, in that nationalist development was to a large extent intertwined with policy advise from the International Monetary Fund (IMF) and World Bank (WB) (Chowdhury & Islam, 1993). Second, the post-colonial period was characterized by the rise of indigenous capital, particularly state-owned or sponsored capital, in competition with the elements of foreign-owned and Chinese capital. During the 1950s and 1960s, indigenous capital was at the vanguard of creating a secure domestic market by adopting an import-substitution industrialization strategy. Later, however, and due in part to pressure from the IMF and WB, ASEAN countries shifted to export-oriented industrialization (EOI) (Chowdhury & Islam, 1993). This was particularly true for Malaysia, Singapore and Thailand, which by the 1980s, were some of the most open economies in the world (Crone, 1983). The shift to EOI was accompanied by state policies designed to attract foreign direct investment into these countries and the use of accounting as a way of enhancing the climate for foreign investments in each country. Finally, since the 1970s, financial elements of capital increasingly became prominent in each country (Dixon, 1991). The move towards internationalization of accounting in ASEAN began during this period. Accounting was no longer merely an adjunct to the government's economic development policy. It was considered part of the basic infrastructure of each country's financial system. Despite these similarities, accounting development was conditioned by a unique configuration of domestic and international factors described earlier. A better understanding of the intersection between domestic and international interests can therefore be obtained by examining each country.

2. ACCOUNTING IN ITS TRANSNATIONAL CONTEXT

In developing our arguments that accounting in ASEAN represents the coalescing of domestic and foreign interests, it appears appropriate to subject to critical scrutiny some of the assertions of comparative international accounting research. This research has examined the nature and possible reasons for differences in accounting institutions and practices among countries and seeks to identify various contingent explanatory variables that purportedly explain why such differences exist (Saudagaran & Diga, 1999). Some argue normatively that the continuation of accounting differences is warranted because accounting serves various idiosyncratic functions in society. As Choi and Mueller (1978, p. 22) point out

> If we accept the proposition that the environments in which accounting operates are not the same in different countries, it stands to reason that accounting must necessarily differ from case to case if it is to retain the sharp cutting edge of social utility.

In contrast, accounting organizations such as the International Accounting Standards Committee (IASC)[3] have outlined an agenda to harmonize accounting globally. This agenda assumes a homogeneous role for accounting in different national contexts and is based rhetorically on an assumed set of global users of accounts (Choi & Levich, 1990). Accounting harmonization has been touted as an inevitable and beneficial process to the growing globalization of business (Turner, 1983). The benefits of harmonization, which are often implicit in these arguments, include serving the needs of investors and facilitating the movement of capital globally (IASC, 1999). Such justifications, however, ignore the multiplicity of interests and agendas embedded in arguments supporting global accounting convergence and conceal the dearth of understanding of domestic processes and pressures involved in having global standards accepted in individual countries. As Hopwood (1994, p. 250) observes,

> Our understanding of many key aspects of international accounting is more rudimentary than many people think and than some would want us to believe. The processes of institutionalization in the area are poorly understood. The emergence of interests in international accounting has not been explored. Little is known to outsiders of the complex and shifting politics that pervade the area. What is known is an official discourse on standardization and its benefits, the status of which is usually taken for granted rather than systematically explored.

Far from being neutral and pluralist in its orientation, the IASC's specific approach to harmonization represents a partial set of interests associated with elements of international capital. International Accounting Standards (IAS) are therefore seen as a means of furthering the interests of global investors in seeking out capital markets which offer the best risk-return characteristics. As pointed out by Willmott, Puxty, Robson, Cooper, and Lowe (1992, p. 49),

> Regulatory agencies are increasingly responsive to the internationalization of the world's capital markets and the mobility of financial capital, impacts which are reflected in international political and regulatory agencies (EC, IASC, OECD and UN).

Such responsiveness is conditioned to a large extent by the increased competition for capital inflows, in which accounting regulation could serve as an important competitive tool (Saudagaran & Biddle, 1992).

While doubts have been raised on whether IASs really constitute harmonization, it is undisputed, however, that they embody a notion of accounting firmly rooted in Anglo-American concepts. As McKinnon and Janell (1984, p. 27) point out,

> The IASC has succeeded in identifying and codifying practice which is predominant in *investor-oriented countries* and, since that is the growing trend, it has succeeded in advocating increasingly popular practice (emphasis added).

Thus, by choice, the brand of accounting espoused as being suitable for global use reflects a fairly narrow notion of accounting as one primarily serving the needs of capital providers. While the IASC has been founded by mostly Western industrialized countries, standard setters in these countries have not used IASs for domestic accounting standards due to their lack of specificity and rigor, viewing them as inferior to locally developed accounting standards (Financial Accounting Standards Board, 1999).

In contrast, IASs have been widely accepted as the basis for domestic accounting standards in many developing countries, including all but one of the ASEAN countries examined here. The popularity of IASs is explained in terms of various functional benefits afforded by such standards. Resource constraints preclude these countries from crafting standards from the ground up. Also, a perception exists that the use of IASs provides a palpable sense of modernity and prestige to their domestic accounting regimes (Saudagaran & Diga, 1997a). This does not, however, specifically address how IASs contribute to the legitimacy of accounting in these countries. Such an analysis requires an understanding of how the adoption of foreign accounting concepts, including IASs, reinforces dominant political and economic interests and is probably the only short-term viable option given for these countries' position in the global capitalist economy.

3. ACCOUNTING AND THE NEXUS OF DOMESTIC–GLOBAL INTERESTS

We advance the notion of accounting as being embedded in a complex network of domestic and international interests. By interests, we refer to the perceived need to maintain and expand the capitalist system based on private ownership and control of modes of production. In an ASEAN context, such need has been associated increasingly with notions of modernization, growth, and progress. Moreover, the structure of the global economy requires countries seeking foreign capital to ensure that domestic conditions (e.g., existence of laws which guarantee the sanctity of private capital) are attractive. Our paper does not seek to critique the existing capitalist system. Rather, it seeks to explain how and why accounting regulation and the accounting profession in ASEAN nations are themselves aligned with the domestic and international interests relating to the capitalist system.

While recognizing the importance of analyzing accounting developments within a particular country, we believe that a nation-centric approach can overlook the role of global linkages in domestic developments. We contend that the domestic accounting regimes cannot be viewed in isolation of broader global interests permeating economic, political, and cultural institutions in society. In analyzing the post-colonial development of ASEAN accounting (and to an extent, similar developments in other countries described as *developing* or *emerging*), we propose the use of an approach that examines the impact of the nexus of domestic–global interests on accounting, as follows: (1) locating countries within the global capitalist network; (2) identifying common interests between domestic and foreign elements of capital; (3) recognizing the impact of state, market and community interactions; and (4) highlighting the relationship between accounting and domestic capitalist arrangements.

These guidelines are prompted by our concerns with existing modes of analysis in comparative international accounting research, which attribute to the accounting craft, a strictly functional and a historical role in society.[4] Rather, we suggest the need for a considered historical analysis of the development of accounting in ASEAN. Such analysis needs to be informed by the role of accounting both in the national and global contexts. Moreover, it should recognize the pervasive impact of capitalism on the interrelationships of groups within and between societies. Finally, the analysis should recognize how accounting is embedded within the ordering principles of state, market, community values and the profession, resulting in various modes of regulation.

3.1. Locating Countries within the Global Capitalist Network

First, it is important to recognize the location of these countries within the global network of capitalist interests (Cox, 1987; Gill & Law, 1989). ASEAN countries have traditionally been important in the world economy as suppliers of raw materials and primary commodities (and in the case of Singapore, in entrepôt trade) (Crone, 1983). Increasingly, however, these countries have become important as markets for manufactures from the advanced countries and as a base for labor-intensive manufacturing activities (Dixon, 1991). The evolving role of ASEAN countries has been described in terms of natural progression of productive differentiation and specialization and application of the economic law of comparative advantage (Chowdhury & Islam, 1993; Dunning, 1988). Fröbel, Heinrichs, and Kreye (1980) labels as *the new international division of labor* the phenomena whereby a country, which climbs the technological ladder, tends to shift its low- end production to countries with plenty of cheap labor. ASEAN has been an important destination for Japanese direct investment and of investment from the Asian Newly Industrialized Economics (NIEs) (Dixon, 1991). This has resulted in notions of a flying geese formation with Japan at the head, followed chronologically by Asian NIEs, the ASEAN states, China, India and Vietnam (Kunio, 1988).

In contrast to orthodox accounts based on comparative economic advantage, several theories have conceptualized global capitalist arrangements in terms of a neo-colonial dependency between the industrialized core countries and less developed periphery countries (Frank, 1975; Mittelman, 1994). According to this thesis, benefits of international commercial arrangements are not distributed equally because of unequal political and economic power relationships between countries. The ASEAN countries are highly dependent on technological transfers from Japan and the West, which raises some doubt on the type of industrial capitalism developing in ASEAN (Crone, 1983). In addition, the traditional dependence of these countries on the export of agricultural and mineral commodities (and later simple manufactured items) makes them captive to global market interests, which are controlled by the core countries (Kunio, 1988).

3.2. Interests between Domestic and International Capital

Second, the analysis needs to focus on alignments of interests between domestic and international capital. The agents of such an alignment of interests include multinational companies (MNCs), multilateral technocratic institutions such as the IMF and WB, and a fairly small group of local political and economic elite that benefit from such arrangements (Frieden, 1991; Migdal, 1988). MNCs tend to be from the industrialized countries and their activities are largely prompted by the search for markets, raw materials or for other competitive advantages. They are concerned about the safety of their investments and their ability to repatriate capital and earnings (Hill, 1994). MNCs bring with them not only financial capital, but also technological and management expertise which can significantly impact the transformation of relatively small economies such as those in ASEAN.

Multilateral financial institutions such as the IMF and the WB (and in ASEAN, also the Asian Development Bank [ADB]) emerged in the post-World War II period as key players in defining the economic agenda of developing countries. These institutions, which are linked closely with the industrialized countries, provide much needed financial resources, but only on the condition that the recipient governments adhere to a stringent neo-classical economic program administered by these institutions (Payer, 1982). Their economic prescriptions are aimed principally at opening up the domestic economy to international trade and adopting *laissez faire* economic principles. The IMF and WB are also important allies in persuading errant governments to comply with conditions regarding the payment of debt to international financial institutions (Körner, Maass, Siebold, & Tetzlaff, 1987; Payer, 1982). Their role raised much controversy during the Asian economic crisis.

3.3. State, Market and Community Interactions

Third, the analysis should include a determination of the balance of forces between the state, capital, and community within each country. While the open capitalist economies of ASEAN have, in varying degrees, welcomed the entry of foreign capital, it is inaccurate to suggest that ASEAN states are simply instruments of foreign capital (Doner & Hawes, 1995). As Puxty et al. (1987) indicate, policy outcomes are the result of shifting coalitions of state, market, and communitarian values. Greater recognition needs to be given to various competing sources of foreign and indigenous capital. State power, in turn, is often exercised by shifting elements of the military, elected state officials, and the civilian bureaucracy (Migdal, 1988).

The role of the state in the accumulation and expropriation of capital needs to be examined carefully. In recent years, ASEAN states have generally featured the growth of various corporatist arrangements between the state and the private sector (Castells, 1992; Hewison, 1985; Laothamatas, 1991; Rivera, 1994; Robison, 1986). Robison's (1986, p.374) analysis of Indonesia can be applied widely to the ASEAN context,

> The state played its key role in the development of the capitalist class, not only providing the political conditions for capital accumulation, including the political repression of labor and the subsidization of food and fuel prices, but actively investing in infrastructure and production. However, the very fragmentation of the capitalist class enabled the state to play a relatively autonomous role in its relations with capital.

The state-market nexus in ASEAN is generally characterized on the one hand by strong state intervention, often in competition with the private sector, as well as the clientilistic dependence of business on government protection (Osborne, 1995). These general features of ASEAN's political economy contrast with the development states of Japan, Korea and Taiwan and are the outcome of a unique set of post-colonial conditions. First, state legitimacy during the early post-colonial era rested not so much on economic performance but on political stability and the selective distribution of economic benefits. Second, the ethnic heterogeneity of ASEAN states highlighted nationalist sentiments to preclude Chinese domination of the economy. Third, earnings from export of resource-based commodities allowed the state to finance extensive forays in the private sector (Doner & Hawes, 1995; Kunio, 1988).

Communitarian values in ASEAN also reinforce the importance of personal relationships in carrying out economic transactions, rather than relying on institutional norms. Patrimonial arrangements in business are manifested in the importance of involving a strong patron in commercial undertakings to increase the probability of success (McVey, 1992; Pye, 1985). The acute sense of social hierarchy evident in ASEAN societies is also reflected in the tacit and unquestioning acceptance of authority in these cultures (Chen, 1975; Evers, 1973). From the viewpoint of the accounting profession, overt self-regulation is not necessarily an important goal. Rather, co-opting state support and patronage is essential to the organization's long-term success.

3.4. Accounting and Domestic Capitalist Arrangements

Accounting and accountants are reciprocally bound to shifting configurations of capitalist arrangements in each country. The presence of well-organized indigenous accounting bodies in ASEAN provides evidence, not only of the increasing sophistication and modernity of capitalist structures, but also of the increasing prevalence of corporatist arrangements between state and profession (Chen, 1975; Evers, 1973). Increasingly, ASEAN states rely on accountants in areas such as taxation, national budgeting and economic planning. Moreover, with the growth of domestic capital markets in ASEAN and supportive state policies on foreign portfolio inflows, the state and profession have a mutual interest in promoting an image of a modern accounting infrastructure, of which the adoption of globally-acceptable accounting standards serves as a powerful symbolic component (Saudagaran & Diga, 1997a).

Accounting institutions and modes of regulation in ASEAN simultaneously support capitalist values and negate those which may challenge the status quo. The presence of sophisticated institutional arrangements and rules legitimates the functional contribution of the profession to national polity. The state benefits because these arrangements are viewed approvingly by multilateral institutions and foreign investors as facilitating the globalization of capital markets (Payer, 1982).

4. ACCOUNTING DEVELOPMENT IN THE ASEAN STATES

We use the approach suggested in the previous section to study the impact of the nexus of domestic–global interests on accounting development in ASEAN. Our analysis focuses on the engagement of the accounting profession with other segments of society to create an advantageous and durable occupational niche. The focus on the process of professionalizing accounting is consistent with previous analysis conducted (e.g., Johnson, 1972). A better understanding of the intersection between domestic and international interests can be obtained by examining each country.

4.1. Indonesia

The development of accounting in Indonesia reflects the growing integration of the country's economy into the global capitalist network, particularly since the late 1960s. Similar to Thailand and the Philippines, such integration has been shaped by the pervasive role of the politico-bureaucratic and military elite in the country's affairs (Robison, 1986). Indonesia's role as a peripheral supplier of raw materials and commodities to the West began during the Dutch colonial period. Sukoharsono and Gaffikin (1993) describe how Dutch accounting practices and commercial legislation were introduced in Indonesia during the 19th century to serve the needs of colonial capitalists. Some of these practices and legislation endured until the 1990s. For example, the Indonesian Commercial Code, which provided the broad framework for financial reporting, was patterned after the Dutch *Wetboek van Koophandel* of the 19th century. Western accounting practices were implemented widely in order to administer the vast industrial and agricultural estates and commercial ventures in the colony.

Compared with other ASEAN countries, the intersection of interests between domestic and foreign elements of capital during the colonial era was not particularly pronounced in Indonesia. The domestic economy was controlled tightly by Dutch and other European colonialists. The locals were excluded from the profitable mining, trading, and agricultural activities and were relegated to subsistence farming activities (Robison, 1986). Neither were Indonesians involved extensively in administrative functions, which were controlled by the Dutch (George, 1992).

These early conditions had a strong and lasting impact on accounting development. First, very few Indonesians were actually trained in Dutch accounting methods. It was only in the 1930s that a few Indonesians were sent to the Netherlands for training. The lack of involvement resulted in a glaring administrative vacuum following the departure of most of the Dutch during World War II and the subsequent Indonesian war for independence. In the absence of an identifiable alternative, most Indonesians relied on Dutch administrative structures even after the Dutch left. At the same time, however, strong nationalist sentiments engendered a suspicion of Western concepts, particularly those of Dutch origin (Dixon, 1991). These conflicting tendencies were mirrored in the accounting realm. On one hand, Dutch commercial and accounting practices were still applied widely in government and large private enterprises. Indonesians trained in the Netherlands were highly regarded. The 1954 Accountants Law which restricted the use of the designation *Akuntan* (i.e., Accountant), recognized Dutch and British accountancy qualifications as being equivalent to local qualifications. The publicly known rationale, however, for establishing the Accountants Law and the Indonesian Accountancy Institute (IAI) reflected the strong nationalist sentiments at the time. It was considered necessary to develop an indigenous accounting qualification to restore the dignity of Indonesian nationals, who were denied equality of status during the Dutch colonial era (Sukoharsono & Gaffikin, 1993).

The country also had weak and disorganized sources of domestic capital when the Dutch left. Most of the domestic private capital was owned by ethnic Chinese who engaged in limited trading activities and enjoyed little political influence as a group (Kunio, 1988). Bolstered by its role in obtaining national independence, the Indonesian military emerged dominant in the government (Robison, 1986). Under this setting, the relationship between the Indonesian state and business sector took on an increasingly patrimonial character whereby

> commercial success was closely linked with the position of a businessperson's patrons in government. Firms grew largely on the basis of preferential government treatment: those which had access to subsidies and various rent-taking opportunities were able to accumulate the capital necessary for further expansion (MacIntyre, 1994, p. 248).

The emerging accounting profession found it necessary to align its interests with that of the post-colonial nationalist government, rather than the weak domestic capitalist class. This alignment of interests was articulated in terms of supporting the government's aim of building an economy owned by Indonesians. The IAI's objectives were couched in terms of promoting the accounting profession in conjunction with supporting government efforts to promote Indonesian national development. In view of the weak demand for accounting services from the business sector, most professional accountants worked for the state. The state's demand for accounting services increased significantly when Dutch enterprises were expropriated between 1957 and 1958 and other Western businesses were nationalized in the early 1960s (Robison, 1986).

The state also began to enter into various private sector economic activities during the post-colonial period, establishing control over banking and public utilities and venturing into commercial/industrial enterprises and international trade (Robison, 1986). The expulsion of most foreign nationals during President Sukarno's rule in the 1950s aggravated the acute shortage of qualified accountants. The IAI turned a national crisis into an opportunity. It strengthened its credentials as a partner in national development by helping the Ministry of Finance establish and operate the State College of Accountants to address the shortage of qualified accountants.

In the 1960s, corporatist arrangements between the accounting profession and the politico-military elite were reinforced by US geo-political interests in the region. The subtle, yet powerful, role of US geo-political influence in the country was particularly apparent in two areas: continuing links between US and Indonesian educational institutions and the policy guidance provided by the IMF and WB. Thus, the US played a significant role in shaping accounting development in Indonesia. US interest in the region was dictated by continuing tension with the Soviet Union and the perceived need to counter the expansion of communism. The US perceived many Southeast Asian states as prime candidates for communist infiltration. The spread of communism in China, Korea and parts of Indochina were viewed alarmingly as evidence of the domino principle[5] at work. Indeed, the Indonesian Communist Party (PKI) was a key player in the Indonesian war of independence against the Dutch and came to occupy a strategic role in the post-colonial government of Sukarno (Osborne, 1995).

Indonesia's experience highlights the importance of educational linkages in diffusing accounting ideas and practices between countries. Prior to the 1960s, the business economics oriented Dutch accounting model was the only one taught in Indonesia. Spurred by the massive shortage of accountants, and the early links with some US universities, the government sent scholars to the US. Between 1960 and 1962, 12 Indonesian universities began to shift the basis of their accounting programs from Dutch to US, although Dutch accounting continued to be taught by most and dominated government practices. By 1975, however, the government mandated that local accounting programs be modeled solely on US practices. Increasingly, the view among government bureaucrats, professionals and accounting educators was that the

US model of accounting was more consistent with Indonesia's desire to modernize its economy.[6]

Another factor that strongly influenced accounting development in Indonesia was the crucial role of the IMF and WB in shaping the country's economic agenda. As early as the 1950s, the battle lines were being drawn between two opposing camps: nationalists and beneficiaries from the use of state policy and resources for private gain wanted a stronger role for the state in challenging the domination of foreign and Chinese capital in the economy; the technocrats advocated minimal state participation in the economy, emphasized the importance of market forces and foreign investment, and were disdainful of state subsidy and protection of certain economic groups (Robison, 1986). The IMF and WB backed the technocrats.

The decisive shift towards US accounting practices occurred in the 1960s, when faced with severe political and economic turmoil, the Sukarno government was replaced by Suharto's military-dominated New Order regime. Amid widespread economic malaise, which saw the domestic economy collapse by the mid-1960s, Suharto attempted to rehabilitate the economy by abandoning statist economic principles for the neo-classical approach encouraged by the IMF, WB and other foreign creditors (Robison, 1986). Supported by these international institutions, economic policy was determined by a group of economists trained at the University of California-Berkeley and appointed by Suharto to key economic ministries.

> In understanding the relationship between elements of the state, market and community in Indonesia, one analyst (Robison, 1985, pp. 308–309, emphasis added) commented that the adoption of the growth policies of the technocrats must be seen as a consequence of political and class conflict, not of the intrinsic superiority of economics. The generals embraced the Berkeley technocrats because ... they were *ideologically acceptable* to the foreign powers to whom the New Order was turning for assistance in economic rehabilitation.... Equally important, however, the Berkeley technocrats offered a vision of economic development in which the existing social order could be maintained.

A parallel argument can be made for the ascendancy of modern accounting methods in Indonesia. The form of accounting considered most appropriate in Indonesia was a function, not of arguments regarding the innate superiority of one form over another, but rather of accounting which reflected the views of the foreign creditors, the politico-military and bureaucratic elite, which sought the support of these institutions, and the accounting profession.

One area of consensus was on the need to promote the modernization of accounting in Indonesia through the entry of the international accounting firms. Encouraged by the IMF and WB, the government passed the Foreign

Capital Investment Law of 1967, which removed restrictions on the creation of partnerships between foreign and local accounting firms. The entry of foreign firms was made conditional upon their providing assistance in training Indonesian accountants and organizing the Indonesian accounting profession.

The accounting profession gained momentum during the Suharto regime through increasingly intimate corporatist arrangements with the state. For example, with the WB's blessings, the IAI was tapped by the government to assist in reactivating the domestic equity markets. The IAI's role was to formulate and recommend a set of financial reporting and auditing standards for the capital market. These rules were formalized when the Third National Congress of the IAI approved three sets of standards for its members: (i) *Prinsip Akuntansi Indonesia* (Indonesian Accounting Principles); (ii) *Norma Pemeriksaan Akuntan* (Generally Accepted Auditing Standards); and (iii) *Kode Etik Akuntan Indonesia* (Code of Professional Ethics of Indonesian Accountants). All three sets of rules were copied from extant American Institute of Certified Public Accountants (AICPA) rules.

Taxation emerged as another area of collaboration. In the mid-1970s, the Directorate General of Taxation signed an agreement with the newly formed Capital Market Executive Board (*Bapepam*) and the IAI, whereby the tax office would accept public companies' audited income statements for tax purposes. In 1979, a new law increased the visibility of the profession by providing tax incentives to companies audited by authorized accountants.

The relative success of the Indonesian accounting profession in securing state recognition and support of its status owes much to the notion of modernization encouraged by multilateral financial institutions. Indonesia is unique among ASEAN countries in the extent and quality of direct assistance, which the accounting profession received from these international agencies. First, the WB encouraged IAI to establish the Indonesian Accountancy Development Foundation in 1974 to orient the growth and development of the Indonesian accounting profession in accordance with the needs of private businesses and the community in general (Yunus, 1988). It is apparent also that the IAI's claim to professional status rested significantly on its adoption of acceptable US standards. For example, the IAI updated its accounting and auditing standards, as well as the profession's code of ethics, between 1984 and 1986 by incorporating more recent US accounting rules. These steps were important in raising the profession's profile and signaling IAI's commitment to accounting change within a modernist developmental ideology. Such efforts of the IAI were supported by the WB and other international agencies. For example, a Ford

Foundation sponsored study conducted by Enthoven (1975) concluded that financial reporting practices of Indonesian companies were lagging behind companies in other ASEAN countries in their adherence to Anglo-US principles.[7]

Most recently, the intersection of interests between foreign and domestic capital providers, the Indonesian state, and the accounting profession is most apparent in the events associated with the growth of the country's capital markets. Ever since the Jakarta Stock Exchange's reconstitution in the mid-1970s, the securities markets have become one of the centerpieces of Indonesia's economic policy. The aim is to increasingly rely on the private sector for economic development. Similarly, capital market reforms were seen as essential to the state's plan to reorient the economy towards the private sector (Dixon, 1991).

Revisions of accounting standards promulgated by the IAI during the period 1984–1986 and approved by the state were prompted by the government's capital market reform guidelines, which were fully implemented in 1987. The outcome of these reform measures saw activity and interest in the stock market increase dramatically. Whereas in 1986 there were only 24 listed companies with a combined market capitalization of US$81 million, by 2000 there were 290 listed companies with a market capitalization of around US$27 billion (Standard & Poor's, 2001). Large Indonesian companies, including state-owned ones, have tapped global securities markets.

Amid these changes in the capital markets, international agencies and domestic groups aligned with the Jakarta Stock Exchange pressured the government to upgrade accounting standards. In response to a report by the Asian Development Bank (Asian Development Bank [ADB], 1995) which was critical of Indonesia's legal and accounting framework, *Bapepam* – Indonesia's capital market regulatory agency declared that a modern set of accounting standards was required in order to strengthen the capital market regulatory infrastructure. It was felt that as a developing country, Indonesia had to pay attention to global market conditions in reforming its economic laws, if it was to successfully compete for foreign capital (Pakpahan, 1994).

IAI, which was asked to consider the matter, recommended that IASs be adopted for domestic purposes. This proposal was viewed favorably by the government, given the precedence of adopting IASs in Malaysia, Singapore and Thailand. The proposal was approved by IAI in September 1994. In January 1995, *Bapepam* officially endorsed the use of IASs by publicly-listed companies. More importantly, two new pieces of legislation enacted in 1995 enshrined the important role of the accounting profession in regulating corporate accounting practice. The Limited Liability Company Law, which replaced the Indonesian commercial code, prescribed that financial statements required by law be audited by a licensed auditor and be prepared in accordance with Indonesian Financial Accounting Standards approved by the IAI and other relevant state agencies. Company management had to explain and justify any departures from such standards. The new Capital Market Law that replaced the 1952 Stock Exchange Law specifically identified accountants as an important group of professionals supporting the development of capital markets. Apart from requiring that the accountants register with *Bapepam*, it also required them to comply with the ethical code and professional standards of the IAI. Finally, public companies were required to ensure that the financial statements were prepared on the basis of accounting principles prescribed by the IAI and generally accepted in the capital markets.

In summary, some patterns are discernible in accounting development in Indonesia. The first is the active and interventionist role of the state in defining the direction of accounting development. Another pattern is the continuing direct and indirect participation of multilateral financial institutions, particularly the IMF and WB, in encouraging Indonesia to adhere to the Anglo-US model of accounting. A third is the relative success of the IAI in securing state recognition of its professional status, although such status depends on the continued patronage of the state rather than that derived from the still (relatively weak) domestic business community.

4.2. Malaysia

In the early 19th century, the British established a colonial regime in Malaysia, while retaining the existing pre-colonial Malay Sultanate arrangement. Similar to Indonesia and, to some extent, the Philippines, Malaysia supplied agricultural and mineral commodities to Europe and North America. This arrangement remained largely intact despite the profound political change, which occurred in Malaysia during the 1950s and early 1960s (Osborne, 1995). British commercial legislation was introduced in the colony between 1900 and 1950. With UK-trained accountants providing services to the mainly British-owned commercial interests, British accounting practices were used extensively in Malaysia since the early 20th century (Tay, 1994a).

The relationship between domestic and foreign sources of capital became increasingly more complex following the country's independence in 1957. While Malaysia emerged as an independent nation, its economy was still controlled by mainly British interests (Dixon, 1991). The pervasive impact of foreign capitalist forces is evident in the negotiations conducted prior to Malaysia's independence, aimed at safeguarding British commercial interest even after independence. Given that the new Malay-led government was in a tight fiscal situation, it was highly susceptible to foreign economic pressure. Such proneness to foreign influence was manifested in the early economic policy of the government. It embraced the recommendations of the 1955 World Bank Mission Report, which advised that the private sector be the primary means of economic growth and that the government's role be limited to providing infrastructure and the fiscal-monetary climate conducive to investment, particularly foreign investment.

More problematic are the interactions between state, market and community in Malaysia and their impact on accounting development. While such interactions are complex, they may be better understood through an awareness of the critical role that racial issues play in the country's political economy. The state's domestic policies have been heavily influenced by the need to balance the political preeminence of the Malays and other indigenous people (i.e., *Bumiputras*) with the economic ascendancy of the Chinese and Indians (Crouch, 1996). The issue of racial balance permeates the financial reporting regulatory sphere and is one of the main domestic factors that has shaped the development and structure of Malaysia's accounting profession.

Increasingly nationalist elements in the Malaysian state sought a more interventionist role for the government. The race riots of May 1969 were a watershed in the country's history. They galvanized the government into acting strongly to reduce the association of economic status with race, which was perceived to be the root cause of racial tension (Crouch, 1996). The New Economic Policy (NEP), adopted in 1970, had two main objectives: (1) to reduce poverty, by raising income levels and increasing employment opportunities for all Malaysians, regardless of race and (2) to restructure Malaysian society and correct economic imbalance so as to eventually eliminate the identification of race with economic status (Jomo, 1990).

The first documented financial reporting regulations were those of the Companies Ordinances of 1940, 1946 and 1956 before Malaysia achieved her independence in August 1957. These ordinances were repealed by the enactment of the Malaysian Companies Act in 1965, which formally established reporting requirements, rules and regulations. The Ninth Schedule of the Companies Act 1965 specifies the disclosure requirements in the financial statements of Malaysian firms. In 1985, the Companies Act was amended to incorporate a revised Ninth Schedule, which contained more comprehensive disclosure requirements.

Accounting's role was to lend credibility to the concept of state entrepreneurialism. Most state-owned entities followed commercial accounting practices and appointed private auditors selected by their boards of directors. Initially, the program was perceived to be successful. Over time, however, even the most creative accounting was not able to mask the dire financial condition that many of these companies were in. The then Auditor-general, Ahmad Noordin bin Zakaria, noted that 350 government-controlled entities were suffering continuous losses. This concern dovetails with the spate of bankruptcies and scandals that have erupted among these entities since the 1970s (Sieh, 1987).

Another aspect of the capital arrangement in Malaysia is the influential role of domestic capitalists in shaping accounting development. To a greater degree than in any other ASEAN country except Singapore, Malaysia has emphasized the development of its capital markets. The Kuala Lumpur Stock Exchange (KLSE) lists some of the largest companies in the region. The growth of these firms affected the financial reporting environment in several ways. First, it highlighted the issue of consolidation reporting. Second, for many companies, the question of how to balance their profit objectives with competing socio-political (especially ethnic-related equity) goals is a delicate one that has yet to be resolved. For example, the government's requirement that all companies transfer 30 percent of ownership to *bumiputra* investors has proved difficult to implement. Finally, many of these companies signal the rise of professional management as opposed to the traditional owner-manager arrangement, although many small and medium-sized family-owned companies are still kept under tight control (Dixon, 1991).

A large proportion of corporate failures in Malaysia have occurred in public enterprises or entities closely associated with political figures (within the context of state entrepreneuralism) and involved financial institutions and quasi-banking operations. In the 1970s, the near bankruptcy of the Bank Kerjasama Rakyat Malaysia, a rural financial cooperative, was partly traced to improper loans to well-connected bank officers, politicians, and their relatives (Gale, 1981). In the 1980s, the most publicized cases involved the Bank Bumiputra Malaysia Finance (BMF) loans scandal and the collapse of Pan Electric Industries, which resulted in an unprecedented three-day closure of stock exchanges in Malaysia and Singapore. In another context, such crises probably would have hurt the public's confidence in financial reports and the role of auditors. However, aside from sporadic efforts by government agencies to improve corporate disclosure, stronger measures to enforce accounting requirements or impose sanctions for violations were only recently taken.[8]

An area where a clear intersection of interests has occurred between state, market, and community values is in the use of the domestic capital market to achieve NEP goals. Arguably, such commonality of interests should have translated into greater demand for corporate accountability. In practice, however, power tended to converge in the state bureaucrats or influential groups within the ruling coalition. While share ownership in Malaysia is fairly broad relative to most ASEAN countries (George, 1992), actual control is exercised by a small group of influential families, government bureaucrats, and foreign interests. In particular, the greater participation of bureaucrats in the equity markets, not only as regulators, but also as trustee investors, does not appear to have exerted pressure for greater disclosure. Gale (1981, p. 25) notes,

> [T]he government has utilized corporations not only as a means of getting things done but also as an extended arm of bureaucratic power. Officials thus have an institutional interest in preserving corporate freedom from public scrutiny.

This view is reinforced by a frank assessment of the weaknesses in the accountability of public companies. The Malaysian parliament could only inquire regarding their operation from the responsible minister and though their annual accounts were tabled in parliament or state legislative assemblies, they were subject to little scrutiny (Jomo, 1990). This situation supports arguments that accounting succeeds in aiding values associated with capital accumulation while simultaneously legitimating the process through its image of rationality and impartiality.

The shifting arrangements between state, market, and community values have strongly influenced the professionalization of accounting. Malaysia was unique among ASEAN countries in that it had two professional accounting bodies: the government-established Malaysian Institute of Accountants (MIA) and the privately-constituted Malaysian Association of Certified Public Accountants (MACPA). The emergence of both bodies reflected unresolved tensions between elements of state, market and the profession and demonstrated the extent to which the accounting profession attempted to reinforce public interest notions of modernization and development.

The largest and arguably most influential voluntary association of practicing accountants was MACPA, which was established in 1958, shortly after Malaysia's political independence, by a group of UK-qualified Chinese and

British accountants. The birth of MACPA may be viewed as the culmination of a process that involved widespread British influence on the country's economic, political, and cultural spheres. Parker (1989) notes that British accountancy bodies have regarded the British Commonwealth as a legitimate market and have used appropriate economic, political, and cultural influence.

Early in Malaysia's independence, this influence meant that one could only obtain appropriate professional qualifications from the UK, thus reinforcing the perception of superiority attached to overseas qualifications. The post-independence period, however, witnessed a transfer of political power to a Malay-dominated state. The Malaysian constitution enshrines the special status of Malays in the federation. It is likely, therefore, that foreign-trained, non-*bumiputra* accountants would be governed under a different set of rules. Under the aegis of British colonial rule, these practitioners were assured of their status and privileges. The new environment, however, posed a significant uncertainty regarding the government's agenda towards the profession. It was already evident that the government was pro-*bumiputra* and would remain so in future (Dixon, 1991).

The establishment of MACPA was an effort to preempt unfavorable government action and unite against possible state intervention. The priority, which MACPA attached to setting professional entry requirements, emerged as a move to achieve legitimacy. First, these requirements reduced the possibility of the government to legislate a parallel entry requirement. Second, it reinforced the UK-based nature of the qualification essential in preserving the status already enjoyed by these accountants. Finally, it provided an opportunity for interested individuals to obtain their qualifications locally, an important compromise given the nationalistic fervor of the times. MACPA also used other steps to strengthen its claim to legitimacy as the body representing the local accountancy profession. Among these was adopting a code of professional conduct, which signaled that the profession existed to serve the public interest, justifying its self-regulatory nature. Another action was to establish formal links with UK accounting bodies. Not only were MACPA's early organizational and educational structure adopted from the UK, the local MACPA examinations were conducted with the support of the Institute of Chartered Accountants of England and Wales (ICAEW). Given the level of British influence in early Malayan policy-making, the ICAEW stands out as a powerful ally in MACPA's efforts to attain legitimacy, from the state and other users.

As anticipated, the Malaysian government initiated steps to regulate the accounting profession. The legislative instruments for achieving this regulatory posture were the enactment of the Malaysian Companies Act in 1965 and the Accountants Act in 1967, which brought about significant changes in the structure of the country's accounting profession. The Companies Act defined the financial reporting requirements for companies in Malaysia. It also required that statutory audits be conducted by auditors licensed by the Ministry of Finance. However, it did not specify the professional qualifications that should be possessed by auditors. Rather, the Accountants Act, 1967 created the MIA whose task was to carry out the provisions regarding the licensing and qualification of auditors.

It appears paradoxical that Malaysia adopted UK-based laws when nationalist sentiments were very strong. Yet, this action was not incompatible with nationalism. It was, in fact, consistent with the modernist agenda being pursued by the country, which called for the state to create and sustain stable conditions to aid the rapid accumulation of capital. A legal and commercial framework, which proved to be acceptable in the UK and other Commonwealth countries, provided a strong boost to the Malaysian state's claim that it was acting in the public interest. Furthermore, the legislation was enacted by a post-colonial Malaysian parliament after due deliberation, rather than being imposed by a foreign power, as was the case during the colonial period, thus mitigating criticisms that it was not an acceptable Malaysian law.

The creation of the MIA reflected the growing nationalist sentiments of the state during the 1960s. Owing to growing criticism of its economic strategy, the state increasingly sought to promote greater opportunities for *bumiputras* (Crouch, 1996). This agenda encompassed the modern sectors of the economy, including the professions. As such, it was politically unacceptable for the government to vest statutory authority on MACPA, which was at that time dominated by non-*bumiputras*. MIA's founding cannot be seen however as a total rejection of MACPA's legitimization efforts. A compromise was reached by designating MACPA as one of the recognized accountancy bodies, which meant that MACPA qualifications were acceptable for MIA membership. Simultaneously, MIA could be used to advance the state's agenda of promoting (or be seen as promoting) *bumiputra* interests in the accounting profession. The state envisioned MIA as a counterpoint to non-*bumiputra* dominance of the profession.

In spite of its broad powers, however, MIA has not been able to exert any significant influence over the development of financial reporting or the structure of the profession in the country. MIA's abilities were severely curtailed since, from the outset, its members had to also be members of one or more of the recognized accountancy bodies. There was no uniquely MIA member nor was there a prospect of having one in the near future. Qualifying its own members required that MIA develop its own education, training, and examination procedures, which would require considerable resources. The government did not seem ready to make this commitment, which would have effectively challenged MACPA's ascendancy. Even if the state decided to take this step, both the state and the business users would still need to rely on the services of existing MACPA members in the interim.

In general, MIA's weaknesses contrasted with MACPA's strengths. By the time MIA was established, MACPA was already well organized and had a considerable number of members. Most of those who had to join MIA to obtain a license were already members of MACPA. MACPA also cultivated linkages with tertiary educational institutions to ensure that graduates of such institutions would be eligible to sit for MACPA examinations. This meant that the state could not use the absence of local qualifications as a ground for questioning MACPA memberships. Finally, MACPA aligned itself with British accounting bodies and practices, which still commanded significant prestige in post-colonial Malaysia (Tay, 1994a).

Prior to the establishment of MIA, MACPA was not involved in standard setting. From 1958 to 1971, UK-based standards were used even though they were not binding. Beginning in 1972, MACPA issued five technical statements borrowed from British and Australian standards. The passage of the Companies Act, 1965 provided an important rationale for developing more detailed accounting standards. With the formation of MIA, however, MACPA recognized the importance of standard setting as a means of strengthening its claim to legitimacy. By explicitly harmonizing its pronouncements with those of the 1965 Companies Act, MACPA sent a strong message regarding its capability to respond to changing government requirements. The choice of UK and Australian standards also effectively obviated possible criticism since the Companies Act was itself based on British and Australian legislation. In order to strengthen its claim to legitimacy, MACPA joined a number of international organizations, including IASC (1975) and International Federation of Accountants (IFAC) (1977). Shortly after joining IASC, MACPA was already considering the use of IASs locally. By 1977, the MACPA council approved the adoption of IASC's first four standards.

MACPA's early entry into IASC and shift to IASs from UK standards can be explained in terms of various factors acting synergistically. First, following the initiation of NEP, the government vigorously implemented a program aimed at reducing foreign and non-*bumiputra* control of modern economic sectors, making it unattractive to be identified with UK-based interests. It was at this time that MACPA began to conduct its examinations independently of the ICAEW in 1970. Second, government policies under the NEP led to the government's buyout program of British-owned companies thereby rapidly reducing British business ownership in Malaysia. The increasing economic nationalism and a smaller British presence in the economy reduced the prestige associated with UK accountancy bodies, an essential factor in MACPA's claim for legitimacy. Conversely, the IASC's formation in 1973 provided a readily available and low cost alternative for MACPA. The adoption of IASs simply continued MACPA's focus on standard-setting as an essential prong in its legitimacy-building efforts. Hence, by adopting IASs, Malaysian accountants (especially MACPA members) were required to maintain a level of competency that was on par with the rest of the world (Saudagaran & Diga 1997a).

Several advantages accrued from the use of IASs. First, IASs did not differ radically from UK-based standards and were able to accommodate British and Malaysian companies legislation requirements quite readily. Second, Singapore's entry into IASC and adoption of IASs provided an incentive to harmonize standards with Singapore due to the close commercial linkages with it. For example, 80 percent of firms listed in the Singapore Stock Exchange were also quoted in the KLSE (Rowley, 1987). These cross-listed companies could avoid significant costs of restating financial statements by following similar accounting standards. In the early 1980s, KLSE required all listed companies to comply with MACPA's IASC-based standards.

In 1987, MIA decided to recognize MACPA's existing standards, with all future standards to be issued jointly by the two bodies. This move was significant for both bodies. For MACPA, it signified the possibility of obtaining statutory backing indirectly by harmonizing its own activities with that of MIA, given the latter's legal authority under the Accountants Act, 1967. This arrangement could presumably be adopted in other spheres as well, as indicated by MACPA's subsequent proposal to create an Accounting Foundation which would cover standard-setting, examination, educational, and research activities. For MIA, the adoption of MACPA standards signaled its attempt to expand its role from merely registering accountants to regulating and standard setting. It was also a tacit recognition that MACPA's resources and organization were superior to MIA's and therefore had to be harnessed if MIA was to make any progress.

By the late 1980s and early 1990s some significant changes occurred in financial reporting practices with regulatory authorities playing a larger role in standard setting. For instance, banks and financial institutions began to move to full disclosure practices as per the guidelines of the Central Bank (Bank Negara). With the establishment of the Securities Commission (SC) in 1993, public companies also moved towards a full disclosure-based reporting system in line with the SC's guidelines. The Financial Reporting Act 1997 (FRA) sets up two independent bodies – the Financial Reporting Foundation (FRF) and the Malaysian Accounting Standards Board (MASB). The FRF oversees the activities of the MASB. In its capacity as the standard-setting body, the MASB sets new accounting standards and revised existing standards when necessary. Section 27 of the FRA identified the SC, the Central Bank and the Registrar of Companies as the enforcing agencies that monitor compliance with the standards of the MASB.

The earlier adoption of IASs by Malaysia can be explained in terms of how IASs fit in the conflicting agendas of local accountants, the state and business community. The dichotomy in the structure of Malaysia's accounting profession represented tensions between the state and the profession, with the question of *bumiputra* participation in the profession being an area of concern. Finally, while the government's position towards financial reporting had largely been *laissez faire*, an increasing amount of regulation has been imposed since the Companies Act 1965 was passed culminating with the FRA 1997. The state's attitude has been shaped by British accounting tradition, which emphasizes flexibility and by the imperatives of state-sponsored entrepreneurialism that requires continuing elements of secrecy. While Malaysia's private professional body managed to maintain a fair level of autonomy and self-regulation, its influence in aspects of domestic financial reporting policy has largely been limited.

4.3. Philippines

Post-colonial accounting development in the Philippines is linked inextricably with the country's relatively brief, but very influential, period of colonization by the US. Despite gaining political independence in 1946, the country has remained largely a dependency of the US economically and militarily for much of its post-independence period. In particular, the operation of US foreign policy in Southeast Asia was evident in the Philippines (George, 1992).

The Philippines was a colony of Spain since the early 1600s. However, British and US commercial interests dominated the country's economy since the 1800s. The Philippines became a colony of the US in the early 1900s, after Spain ceded the Philippines following the US-Spanish war and several years of warfare against the Philippine independence movement. The United States colonial government rapidly consolidated its control over the islands, imposing a political and educational system patterned closely after US models. The Philippine economy was relegated to supplying raw materials and other commodities to the US (Dixon, 1991).

Modern notions of accounting were introduced in the Philippines by UK and US accountants (Zulueta, SyCip & Pickup 1967), who arrived essentially to service the commercial needs of the British and American firms. As Melo (1967, p. 248) observed,

> The continued progress of commerce during the American administration and the constant flow of foreign capital into the Philippines gave a marked impetus to the accounting profession. ... [The] situation invited American CPAs and English CAs to open offices for the practice of their profession in the Philippines whose clients were of their own nationals. In harmony with the colonial practice – trade follows the flag – so foreign businessmen and bankers chose their nationals as auditors.

The unique circumstances of the country's political economy contributed to the relatively greater prestige and power enjoyed by the accounting profession, in its relations with the state and the market. During the colonial era, the accounting profession aligned its interests with that of the colonial administrators and the group of Philippine landed elite who controlled the domestic economy and who had a vested interest in preserving American colonial administration, which they viewed as a stabilizing force in the country (Hutchcroft, 1994). Early evidence of the successful professionalization of accounting in the Philippines includes the state's recognition of accounting as a distinct profession during the colonial era. During this time, accounting was already relatively well-established in the country, with several American and British firms having opened offices in Manila (Tan, 1994). In 1929, the Philippine Institute of Certified Public Accountants (PICPA) was established in order to raise the standards of public accounting, purge the profession of illegal practices, and oppose legislation being considered to permit the issuance of CPA certificates without requiring the CPA examination. The professional body was instrumental in creating a monopoly structure consisting of those granted a CPA certificate, after passing an examination administered by the Board of Accountancy. In practice, however, the examination was designed by members of PICPA (Zulueta et al. 1967).

Following the methodological guidelines proposed in Section 3, accounting development in the Philippines can best be understood in terms of the country's post-colonial political economy. The local environment featured a high degree of integration between the interests of domestic and foreign capital, particularly the hegemony of the US in key aspects of Philippine life. On the other hand, state, market and community interaction in the country was characterized by the relative weakness of the Philippine state vis-a-vis the indigenous political and economic elite. As Dixon pointed out (1991, p. 200),

> The development of the Philippine economy since independence has been colored by the country's continued dominance by the USA, recurrent economic crises and, from 1961, subservience to the IMF. Nowhere else in South East Asia has the influence of the former colonial power remained so strong.

Philippine economic dependence on the US is illustrated by the Laurel–Langley agreement of 1954, which accorded US entities the same rights as Philippine nationals in all aspects of the economy, including the exploitation of natural resources (an area, earlier reserved for Philippine nationals under the country's constitution) (Crone, 1983). Even as late as the mid-1980s, Kunio's (1985) study of the largest Philippine companies showed that more than 80 percent of foreign-owned firms in the country were US MNCs. Faced with the strong demands of an entrenched oligarchy and the dominance of foreign capital, the Philippine state has largely been unable to implement a coherent strategy of development (Hutchcroft, 1994). While the state espoused the development of a modern industrial economy attuned to world markets, in practical terms, small elite benefited from access to political or economic power. Moreover, the state was relatively compliant to the demands of well-organized lobby groups (Hutchcroft, 1994). One of these groups was the domestic accounting profession. Consistent with the analysis of Robson, Willmott, Cooper, & Puxty (1994), the development of Philippine accounting, more than any other ASEAN body, demonstrates the extent to which the profession succeeds in deploying the state's resources to advance its own interests.

The accounting profession that emerged in the post-war Philippines was the largest and, arguably, the best organized in Southeast Asia. It was able to exploit these strategic advantages to secure important concessions from the relatively weak Philippine state. In 1947, the professional accounting body was re-established under the new name – the Philippine Institute of Accountants (PIA). PIA had four principal aims: (1) to improve tertiary instruction in accounting and related subjects; (2) to raise professional standards, efficiency, and ethics; (3) to expand the profession's opportunities through legislative and other means; and (4) to restrict the practice of accountancy to Philippine citizens. According to its founders,

> The elimination of the words *Certified Public* from the name of the Institute reflected the changed outlook of the members of the post-war [post-colonial] Institute. The members

> were determined to make the Institute a *real* professional organization and not merely a *protective* association as it was during the prewar years (Zulueta et al. 1967, p. 128, italics added).

In practice, however, the PIA still looked to the US profession as its model. Soon after the AICPA set its Statement of Auditing Standards in 1947, the PIA adopted them in 1949. Later pronouncements on financial reporting issued by PICPA (the PIA renamed itself as PICPA in the 1950s after the initial nationalistic fervor subsided) were reflective of US professional practice. The influence of US regulations was not only apparent in the Philippine accountancy practice but also in legislation governing commerce. The Corporations Law of 1980 was partly based on the original law passed in 1906 during the US colonial era; the Revised Securities Law of 1982 was also based on the US Securities Act of 1933 and Securities Exchange Act of 1934; and Title II (Income Tax) of the Philippine National Internal Revenue Code was patterned after US income tax legislation. Even the Philippine SEC established in 1938 was modeled on the US SEC despite the differences between the two countries' capital markets (Saudagaran & Diga, 1997b).

The number of CPAs grew rapidly in the Philippines post-independence. From 1946 to 1962, more than 6,000 CPAs were licensed. The significant increase in CPAs reflected the demand from business activities, which were dominated by US enterprises. During the 1960s, PICPA considered itself the guardian of the profession's morals and interests. Disciplinary proceedings were imposed on errant members to demonstrate the effectiveness of the profession's self-regulatory activities. The profession also participated in various national and international activities to raise its public profile. In 1957, it sponsored the First Far East Conference of Accountants, which included organizations from 20 Asian Pacific countries. PICPA also participated as an impartial observer in the "Operation Quick Count" in the 1961 National Elections, harnessing its extensive provincial network of members. These activities contributed to an image of a dynamic and nationally-oriented professional organization.

The late 1960s and early 1970s featured increasing state intervention in accounting, which, arguably expanded rather than reduced the relative power of the profession. The Accountancy Act of 1967 sought to standardize educational requirements, the CPA examination, and the supervision and control of accounting practice. The law created a Board of Accounting Education whose task was to standardize undergraduate educational requirements for those intending to take the CPA examinations. Since PICPA was consulted on the proposed educational requirements, the profession was able to ensure that its views on proper accounting education were institutionalized in accounting courses offered by universities nationwide. PICPA was also consulted on the rules governing the CPA examination and license (Tan, 1994).

In 1972, President Marcos set up an authoritarian regime by declaring martial law. As in other states, which combined authoritarianism with patrimonialism, contradictions emerged in the domestic political economy. While the state ostensibly pursued structural economic reforms (to open the economy to foreign trade and investment) in line with IMF and WB advise, the Marcos regime was also engaged in securing lucrative advantages for a close set of associates in a system often dubbed as crony capitalism (Hutchcroft, 1994).

The martial law period saw increasing centralization of state power in the hands of the Marcos regime. New regulations on financial reporting and accounting practice were established. In 1973, the state created a Professional Regulations Commission (PRC), a supra-body that had jurisdiction over all domestic professional bodies. Directly under the PRC were several boards such as those in accountancy, engineering, and medicine, with responsibility over their own areas. In 1975, a Presidential Decree created a new Board of Accountancy with centralized authority for the accounting profession. The definition of accounting practice was expanded to include not only those in public accounting, but also those in government, commerce and industry, and education. A revised code of professional ethics, with separate sections for each of these groups of CPAs, was passed in 1978. While the new regulations were couched in terms of improving the conditions for Philippine development, the state's tacit agenda was to install supporters of the ruling regime in strategic areas of the economy (Mackie, 1988).

Despite the proliferation of new state agencies concerned with regulating the accounting profession, the power it exercised was hardly compromised. The regulatory character in the Philippines can be described as corporatist in nature. At the institutional level, an established system of consultation between state agencies and PICPA existed. The seven members of the Board of Accountancy, for example, were appointed by the Philippine President upon the recommendation of the profession. The Board's licensing examinations and the code of ethics were prepared in consultation with PICPA which was accredited in 1975 as the bonafide professional organization of CPAs in the country. Since the mid-1980s, the issuance of a CPA certificate also meant that the licensee received PICPA membership.

Accounting as a profession continues to enjoy significant prestige in the Philippines. It is a popular career choice with over a quarter million tertiary students enrolled as accounting majors. The profession enjoys significant political clout given its large membership, including among politicians and in key positions in commerce and industry. Also, the Philippine firm SGV and Company was the only firm able to challenge the dominance of the then Big 8 firms in Asia, setting up branches in all the ASEAN countries, Japan, Hong Kong, Taiwan, and the Middle East.

In 1979, PICPA charged its Committee on Accounting Principles to study accounting standard setting in the country. The Committee concluded that current arrangements were unsatisfactory because of the lack of statutory backing of accounting standards, lack of monitoring of compliance, lack of sufficient consultation outside of the accounting profession, and a tendency to rely too heavily on US standards. The Committee recommended the establishment of an independent accounting standard-setting body. As a result, PICPA sponsored the establishment of an Accounting Standards Council (ASC) in 1981 to establish and improve accounting principles. The makeup of the ASC reflects the continued domination of regulatory arrangements by the profession with four of eight members from PICPA (Tan, 1994).[9]

While it is arguable whether the inclusion of these external bodies constituted mere tokenism, the ASC was effectively accorded the official imprimatur of the state. Following the inclusion of the Philippine, SEC, and Central Bank into the ASC, these agencies mandated that enterprises under their jurisdiction comply with ASC's standards. The SEC, in particular, while empowered to set accounting regulations has delegated this task to the ASC. The Board of Accountancy also requires all licensed CPAs to ensure that organizations comply with ASC standards. Moreover, the Bureau of Internal Revenue requires companies to comply with ASC standards, except on issues where the tax law dictates otherwise (Tan, 1994).

The substance of accounting standards promulgated by the ASC reflects predominant, US-based accounting practices. Disclosures are essentially geared towards the financial markets, even if a majority of the firms operating in the country are tightly-controlled family companies, MNCs or government-owned enterprises. More so, than in any other ASEAN country, the Philippine situation reflects the success of the profession in its dealings with a relatively weak state apparatus. Unparalleled elsewhere is the dominance of US models, which permeate most aspects of the Philippines' economic milieu, including its approach to the accounting profession. It is asserted that while a body such as the ASC appears to be independent and pluralist in its orientation, in reality, it serves to advance the interests of the accounting profession, which in turn, is consistent with the interests of domestic and foreign capital in the country.

4.4. Singapore

Accounting development in Singapore shares a significant common heritage with Malaysia. Until August 1965, Singapore was part of the Malayan Union, which secured independence from Britain in 1957. Racial and political tensions between the Malay-dominated peninsula and the Chinese-dominated Singapore island resulted in the Union being dismantled. Nonetheless, the two countries feature a strong British-orientation in their accounting systems, embedded within a framework of commercial legislation inherited from the UK. Singapore's Companies Act 1967 and Malaysia's Companies Act 1965 were both patterned after the UK Companies Act 1948 and the Victoria Companies Act 1961 in Australia (Walton, 1986).

When first enacted, the Singapore parliament wanted legislation that was consistent with its neighbor. However, while the external features of accounting systems and supporting legislation are similar in Malaysia and Singapore, the environment in which these regulatory systems exist and their mode of application differs significantly. Differences in the culture and political economy exerted an unmistakable influence in the way accounting developed in the two countries. While the Malaysian economy, until recently, has depended on the export of agricultural and mineral commodities, the Singaporean economy has traditionally relied on entrepot trade. Also, while the Malaysian government generally had an ambivalent and cautious attitude to foreign investment, the Singapore government actively promoted Singapore as a base for MNC operations (Dixon, 1991). These differences are important in understanding the context in which accounting developed in Singapore.

The main considerations underlying Singapore's political economy since the colonial era have largely been transnational in nature. Singapore was established as a trading post in 1819 by the British East India Company primarily to challenge the Dutch domination of commerce in the region. In the late 19th and early 20th century, Singapore became an important commercial and financial hub of Southeast Asia. During this period, an increasing number of Western enterprises established operations in the island. The structure of the population also changed significantly. Although Singapore remained a cosmopolitan center, waves of migration increased the proportion of Chinese settlers such that by the early 1900s nearly 75 percent of the population was ethnic Chinese, a proportion that has been fairly constant since that time (Dixon, 1991).

Most professional accountants during the colonial era were expatriates from the UK. Accounting firms, including Coopers, Price Waterhouse, and Deloitte, established operations in Penang, Kuala Lumpur and Singapore in the early 1900s to provide services to agricultural plantation, mining and trading companies (Institute of Certified Public Accountants of Singapore [ICPAS], 1994). There was little difficulty in aligning the accounting profession's interests with that of the state, market and community values. The state viewed the market, particularly foreign investment, as the vanguard which would ensure its survival. Community values were consistent with the state's view of preserving Singapore's way of life, which was associated with it being a regional entrepot center. In turn, the market, which was dominated by foreign commercial interests, required the services of qualified accountants.

The alignment of interest between the accounting profession and the government is evidenced by the strong level of state support to the profession. For example, the establishment of the MICPA in Singapore was sponsored by the Singaporean government, which had already sponsored the formation of the first local school of accountancy at Nanyang Technological University (NTU) in 1955. Singapore had recognized accountancy qualifications from all British Commonwealth countries, albeit unofficially. External examiners from the UK, Australia, and New Zealand had even been assigned to review the qualifications of the local accountants.

During the early 1960s, the diverging political interests between Malaysia and Singapore were increasingly apparent. The People's Action Party headed by Lee Kuan Yew was swept to power in 1959. While Singapore saw the vital importance of being brought into a union with Malaysia for military and economic survival, the government of the then Malayan Federation was reluctant to draw closer to Singapore because such a move threatened the political dominance of the Malays in government. There was a brief period of rapprochement and Singapore was brought into a new Malaysian Federation, which lasted from July 1963 to August 1965. However, strains caused by Indonesia's objection to the Malaysian Federation, Malay communal riots in Singapore, perceived interference into each other's affairs, and Lee Kuan Yew's attempt to unite all Malaysian opposition parties to challenge the Malaysian government resulted in the union being disbanded (Foo & Ng, 1994). Thus, MICPA was no longer acceptable to both the Singapore government and the accountants, who wanted a distinct Singaporean accounting body.

In 1961, an Australian team was invited to study the accounting development in Singapore. Based on its recommendation that a statutory body to register and regulate accounting practice be established, the Accountants Act was passed in December 1963. The Singapore Society of Accountants (SSA) was recognized as an official professional body, licensing and registering authority. It was also given the mandate to deal with disciplinary matters, establish a code of ethics, formulate accounting and auditing standards, and set guidelines for professional development. Unlike in other ASEAN states where accounting bodies generally had to struggle to obtain professional recognition, there was a clear corporatist arrangement between the state and the accounting profession in Singapore from the onset. However, the arrangement was more in the nature of a big brother relationship with an authoritative and powerful state supporting and encouraging the development of the accounting profession.[10]

Consistent with the professionalization process in other ASEAN countries, the SSA's early focus was on raising the stature of Singapore's accounting profession. The SSA Council established membership rules with admission initially open to persons already qualified in any of the other British Commonwealth countries. Later, qualifications were expanded to include graduates of NUS and NTU as well as members of the UK Association of Chartered Certified Accountants (ACCA). The Companies Act 1967 was important in enshrining the investor orientation of Singaporean accounting and the role played by auditors. In 1966, the profession's code of ethics was established, patterned after the UK, Australia, and New Zealand, while in 1970, the SSA issued Bulletin Number 1, "Standards of Disclosure in Financial Statements," providing specific recommendation on how to comply with the Companies Act.

The perceived role of accounting in Singapore has been firmly located within a framework of export-oriented industrial and economic development which was a pragmatic response given the country's lack of natural resources, its dependence on external sources for almost all its basic requirements (such as food and raw materials), and a population too small to support a significant domestic market. However, Singapore's strategic location, its excellent natural harbor, and history as the center for entrepot trade made it an attractive hub for regional operations. In addition, Singapore's well-educated population and stable political environment also attracted overseas investment. In the 1970s, the government vigorously implemented a strategy to diversify the country's economic base from export-oriented manufacturing and trade to financial and other services. The aim was to transform the country into a regional financial and services center.

The Asian Dollar and Bond Market were established and numerous incentives were provided to locate overseas financial institutions in Singapore (Dixon, 1991).

With the state's growing emphasis on attracting foreign capital, the SSA increasingly sought to align itself with international accounting forums, joining the International Congress of Accountants in 1972, the Confederation of Asian and Pacific Accountants in 1973, the IASC in 1975, and IFAC in 1976. Singapore was one of the earliest associate members to join the IASC and to pledge support for global accounting harmonization ideals. As with Malaysia, the SSA explained its decision to adopt IASs in 1978 in terms of the advantages to Singapore: "Pitching ourselves to the best of international standards is vital if we are to inspire confidence in business and create a sense of stability, so necessary for the proper development of the country's economy" (ICPAS, 1994, p. 39). However, SSA explained that IASs were not to be adopted indiscriminately and were subject to revision to ensure that they complied with Singapore's laws. There was another rationale from the profession's viewpoint for seeking alignment with international bodies and that was "identification with these two organizations [IASC and IFAC] proved a critical factor in the international acceptance of Singapore's [accounting] professionals" (ICPAS, 1994, p. 410). From the state's perspective, the adoption of IASs by the profession was consistent with the image it wanted to project of Singapore as a progressive and dynamic global financial center.

In 1987, the Singapore government enacted an amended Accountants Act, which reduced the autonomy enjoyed by the accounting profession. The Act transferred the licensing and registration functions from the professional body to a government-appointed Public Accountants Board (PAB). In lieu of the SSA, the Institute of Certified Public Accountants of Singapore (ICPAS) was formed in 1989 to oversee professional ethics, standards and development. The title *Certified Public Accountant* was chosen to replace the dualistic *Public Accountant* and *Registered Accountant*, although all accountants were still required to be members of the ICPAS. On the establishment of the PAB, the president of Singapore's professional body commented:

> We believe that the separate Accountants Board and professional body structure (which is in line with the structure of the accountancy profession in advanced countries as well as in line with that of other professions in Singapore) would place the accountancy profession in Singapore in a better position to achieve the common goals and aspirations of our profession and our nation. (ICPAS, 1994, p. 39)

Another possible reason for establishing the PAB relates to the tarnished image suffered by the accounting profession because of the collapse of Pan Electric Industries, a company listed in both the Kuala Lumpur and Singapore stock exchanges (Rowley, 1987). For the first time in the history of the profession in ASEAN, auditors of the company were sued under the Singapore Companies Act for breach of duty to shareholders. The financial press was critical of the auditors' cozy relationship with management and called for increased government regulation of the profession. The existing arrangement whereby the SSA investigated one of its own members was deemed unsatisfactory. One of the main duties of the PAB was to conduct investigations and impose sanctions for violations of the Accountants Act. The incident also led to amendments of the Companies Act requiring that auditors report to the Minister of Finance any knowledge of fraud by a company's employees. A consolation to the accounting profession was that as a result, disclosure requirements found in professional accounting standards (based on IASs) were incorporated into the Companies Act. While previously, compliance with accounting standards was imposed only on members of the professional body, the amendments made the standards mandatory for all Singapore companies. The newly formed ICPAS also attempted to repair the image of the profession by strengthening and making more visible the activities of its Financial Statements Review Committee, which reviews companies' published financial reports.

4.5. Thailand

Unlike other ASEAN countries, Thailand's initial integration into the global capitalist economy was not a direct result of colonization since Thailand remained politically independent. Rather it was drawn into the global capitalist economy by virtue of its trading relationships with the Europeans. A series of trade treaties, beginning with the Bowring Treaty with the British in the 1870s, ushered in European and American commercial interests into Thailand's domestic markets. In return, Thailand exported its raw materials, mainly rice and teak lumber. However, since political and economic power was largely controlled by the Thai monarchy, the interests of foreign providers of capital and the domestic elite did not always converge (Dixon, 1991). These differences were manifested in the development of accounting in Thailand.

Among the five ASEAN countries, Thailand's accounting regulatory system is the only one that can be described as being historically legalist in orientation. Although other ASEAN countries also feature an interventionist state, it is only in Thailand that deliberations on accounting matters have been dominated by the government. Thailand is the only ASEAN country that has legislated two separate Accounting Acts (in 1939 and 1971) which specify the accounting records that must be maintained, the format and content of accounts, and provisions for submission and audit (by government) of financial statements.

The 1939 Accounting Act was enacted for three ostensible reasons: 1) to maintain accurate and orderly accounts of persons engaged in business and professions, 2) to protect the interests of persons concerned, and 3) to facilitate fair collection of taxes. Inspectors from the Ministry of Economic Affairs were empowered to audit the accounting records, although in practice, the inspection procedures appeared to have been applied selectively. This state of affairs was suggested as the rationale for enacting the 1971 Accounting Act which drew attention to problems in enforcing the 1939 Act, given the large number of businesses exempted from its provisions via ministerial regulations (Holzer & Tremblay, 1973).

Thailand's position in the global political economy and domestic interactions between state, market and community values help to explain the rationale for this legislation. The period from 1932 to 1957 witnessed intense Thai nationalism (Laothamatas, 1991). A group of French-educated military officers led a bloodless coup, which ended the system of absolute monarchy in the country and replaced it with a system of government dominated by the Thai military. The state's objective was to wrest control of the economy from mainly the British associations that had come to significantly control the economy through the trade treaties earlier mentioned. Societal tensions also resulted from widespread disenchantment over the economic dominance by Chinese immigrants. The military-led government at the time, inspired by growing Japanese economic and military nationalism, rationalized its actions in terms of countering Western domination and restoring the respect once enjoyed by the Thai state. In contrast to the pre-revolutionary government (i.e., absolute monarchy until 1932), the state played a leading role in commerce and industry, establishing numerous state-owned enterprises, nationalizing various strategic industries (e.g., petroleum refining), and reserving certain businesses and professions, including accounting, to Thai citizens or to state-owned agencies (Laothamatas, 1991). Prior to 1932, accounting practice was unregulated and, because of the number of Western commercial houses, was largely in the hands of European and American nationals. There were few indigenous foreign-trained accountants except those sponsored by the Thai monarchy.

Despite the absence of a direct transnational alignment of interests, accounting in Thailand was consistent with the overall agenda of the government. The 1939 Accounting Act served as a powerful, rationalizing tool for legitimating government intervention in micro-economic affairs, including monitoring Chinese-owned businesses, which were branded as anti-nationalist. Government policy on non-Thai businesses, in general, was designed to encourage the expansion of domestic capital, while also preventing the economic elite from gaining political ascendancy (Hewison, 1985). Simultaneously, however, many ethnic Chinese were co-opted by the government to manage newly established state-owned enterprises or to invest jointly with the government. This brand of nationalist, state capitalism was also evident in government attempts to rationalize the generation and control of state revenues. One of the primary aims of the 1939 Act was to increase tax revenues. By forcing businesses to maintain accounts designed by the state and allowing state tax inspectors significant power to oversee compliance, the government could funnel tax revenues to finance its increasing stake in the economy.

During the Second World War, the Thai military leadership allied with Japan and declared war on the UK and the US. There was a mass exodus of foreigners and most Western businesses were taken over by the state. However, an auspicious set of post-war circumstances combined with astute Thai diplomacy mitigated the displeasure of the Allies. The post-war era was followed by a brief period of civilian rule (1945–1947), after the military leadership was deposed and constitutional democracy was restored (Laothamatas, 1991).

However, the advent of the Cold War coupled with general instability in the Indochina region, saw Thailand being drawn into US security interests as a possible counter to Communist expansion. During the post-war period, Thailand began "a new international career as an anti-Communist ally of the US, receiving considerable US military and economic aid" (McVey, 1992, p. 19). This period saw an increasingly pro-US oriented policy being implemented in the country, itself reflected in the organization of accounting regulation in Thailand.

In October 1948, Thailand's first and only accountancy body was established. The Institute of Certified Accountants and Auditors of Thailand (ICAAT, 1993) was formed with about 90 members, consisting of accounting academics from Thammasat and Chulalongkorn Universities and practitioners, mainly from government. By 1962, ICAAT's membership grew to about 400. According to its Charter, the objectives of ICAAT are: to encourage and foster unity among, and to maintain prestige, of its members; to promote, disseminate, and exchange knowledge of accountancy and related subjects; to promote the profession and its highest standards; to provide cooperation and assistance to its members; and to provide support to general public activities, other than politics (Tay, 1994b).

These stated objectives of ICAAT provide indications of how its members perceived and wanted to project accountancy. First, accounting was seen as a profession whose aim was to achieve the highest standards. ICAAT was necessary to assist in bolstering the social status and prestige of accountants in the society. ICAAT also reinforced the view of accounting as a rational and scientific body of knowledge requiring adequate training. This perception was drawn from the early roots of accounting education in Thailand, certainly one of the earliest in ASEAN. Since 1935, Thammasat University offered accounting courses as part of the Master of Science in Economics. In 1938, it established a separate accounting department with a program patterned after the UK Chartered Accountant system. The other major university, Chulalongkorn, established a Faculty of Commerce and Accountancy in 1939, which offered programs leading to Bachelors and Masters degrees in Accountancy (Institute of Certified Accountants and Auditors of Thailand [ICAAT], 1973). The post-war era also saw increasingly close links established between Thai and US universities. Finally, while accounting was seen to contribute to the public sphere, ICAAT's charter emphasized its apolitical nature.

Despite its avowedly apolitical stance, ICAAT lobbied for favorable legislation on its behalf. Unlike professional organizations in the UK, which saw the independence from government regulation as being a worthwhile goal, ICAAT lobbied hard for the enactment of the 1962 Auditor Act, which specified Thai auditors' qualifications and responsibilities (Ninsuvannakul, 1966). The law defined an authorized auditor as a person duly licensed to certify all financial statements submitted to government agencies for registration and taxation purposes under the Thai Civil and Commercial Code and Internal Revenue Code. The task of licensing auditors was reserved for a newly formed Committee for the Control of the Auditing Profession under the Ministry of Economic Affairs. Hitherto, the state did not officially recognize accounting or auditing as a profession. Enactment of the law represented a key advance in the accounting profession's search for government recognition. The difficult nature of being admitted into the profession is underscored by extremely low pass rates of candidates (Tay, 1994b).

There are two crucial differences between the Thai regulatory environment and those in other ASEAN countries. First, licensed auditors are not required to be members of the professional body, ICAAT. Second, the powers of the Board of Audit supervision are broader than in other ASEAN countries and include, determining the criteria for licensing auditors, administering the licensing exams, reviewing and approving accounting and auditing standards set by ICAAT, reviewing company financial statements, advising educational institutions on their accounting courses, and monitoring auditor compliance with legal and professional requirements.

However, state recognition of the accounting profession cannot be attributed solely to ICAAT's lobbying. The fact that the power to grant professional status remained exclusively with the state, without any requirement to be a member of the profession, indicates that ICAAT's power was largely limited. Conditions during the early 1960s also made it auspicious for the state to provide a system for licensing auditors. During the late 1950s, the era of intense nationalism was waning. In its place, the government emphasized the rapid economic modernization of the country under authoritarian rule. The US, by the early 1960s, was thoroughly engaged in Thailand pumping in more than US$2 billion in economic aid, loans, and military expenditures and becoming its most important trading partner. The issue of economic aid was intertwined with the search for stable capitalist markets. As Hewison (1985, p. 277) suggests, "indeed, aid was seen by many American business people and officials as a means to encourage healthy attitudes towards private enterprise, and Thai officials who exhibited such attitudes were encouraged." In order to allay the fears of foreign investors, the government provided guarantees against expropriation of their investments. The Promotion of Investment Act (1960) provided explicit guarantees that the Thai government would neither compete with nor nationalize any private industrial activity. In addition, WB advisers began to play a more prominent role in mapping out a path of progress for Thailand, emphasizing that the "relative importance of manufacturing activity be increased," and that this ought to be achieved through "private initiative, both domestic and foreign" (Hewison, 1985, p. 278). These recommendations were adopted in their entirety in Thailand's first WB sponsored national development plan from 1961–1966. By the 1960s, these notions regarding the roles of the state and market had permeated the government policy. As expressed by the Minister for National Development in 1965 (Sarasin, 1965, p. 21):

> Thailand's industrial growth ... must be based upon a built-in private enterprise system with minimum government interference. Government must take it as its responsibility to ensure that there always exists an economic environment conducive for the growth of

> private investment, both foreign and local. The government must not in any way obstruct the path of private industrial growth.

One of the essential institutional infrastructures for contributing towards a rational path to economic development was a corps of well-trained auditors who could ensure proper financial accountability of private enterprises (Holzer & Tremblay, 1973). The Auditor Act meshed quite nicely with the establishment of the Industrial Finance Corporation of Thailand (IFCT) in 1959 (under WB auspices) whose objectives were (1) to assist in the establishment of, expansion or modernization of private industrial enterprise; and (2) to encourage the participation of both domestic and foreign capital in these ventures. Licensed auditors were at the forefront of ensuring the success of these financing programs.

Following Riggs' (1966) analysis of Thai political economy, the relationship between ICAAT and the state agencies can be described as a bureaucratic polity. Riggs' assessment of state-market relationships in Thailand indicates a dependence of weak private sector groups on patronage by a powerful military-bureaucratic elite. State patronage, in this regard, was essential for the legitimacy enjoyed by ICAAT, although by itself, the accountancy body enjoyed limited influence in government policy deliberations. Several instances would substantiate this assertion. Unlike professional bodies in other ASEAN states, the earliest code of ethics for accounting professionals was promulgated under a Ministerial Regulation in 1968, with ICAAT only playing a relatively minor role in its deliberation. The code was patterned after the US Accounting Code of Ethics. One of the articles of the code specifies that "no documents should be certified unless the necessary supporting evidence has been gathered in accordance with generally accepted auditing standards" (Code of Ethics, Art. 13). Since the Board did not indicate which auditing standards are referred to, ICAAT has suggested the adoption of US auditing standards. As Holzer and Tremblay (1973, p. 74) observed, the presence of the legal institution of auditing and professional code mean that

> Practically all the legal and professional prerequisites for a modern accounting profession [are] present in Thailand. The major ingredient still missing is the acceptance of some binding standards of financial reporting (akin to GAAP in the US).

These binding standards of financial reporting, however, have a somewhat different connotation in Thailand. First, the government, rather than ICAAT, has traditionally defined financial reporting requirements, particularly through the Accounting Acts. Until the late 1970s, Thailand had generally adopted the Continental European practice of prescribing uniform presentation formats and disclosure requirements, depending on the nature of business activities. Second, although ICAAT compiled a list of basic (UK, US based) accounting concepts and principles as early as 1972 (ICAAT, 1973), it was not until 1979 before the first Statement of Financial Accounting Standard (SFAS) was promulgated and, even then, only under the tacit approval of the state. The Board of Supervision of Auditing Practice and the Stock Exchange of Thailand also placed their imprimatur ex post on these accounting standards to make them enforceable on companies under their jurisdiction (Tay, 1994b).

A prominent feature of Thai reporting standards is that while state legislation reflects Continental European notions of conservatism (e.g., adoption of legal reserves and tax-based financial reporting) and use of standardized accounts, accounting standards are generally anchored in Anglo-American accounting concepts. This characteristic may strike observers as being paradoxical. In practice, however, the dominance of Anglo-American accounting concepts is unquestioned (Indaravijaya, 1981; Tay, 1994b). The predominance of Anglo-American accounting practices is now even more pronounced with the adaptation of UK, US, and IASC accounting standards for domestic use.

The increasing use of Anglo-American accounting concepts occurred within an economic regime where regulations that were overtly nationalist were relaxed to attract foreign (mainly US) companies to establish operations in Thailand. This process began in the early 1960s and accelerated dramatically in the 1970s and 1980s. As in Indonesia, Malaysia and the Philippines, the Thai economic environment in the 1970s was characterized by increasing reliance on international capital markets (Crone, 1983). But what prompted the adoption of accounting standards based on US GAAP and IAS for local reporting purposes? First, the period between 1973 and 1982 witnessed a series of new legislation aimed at increasing the efficiency of capital markets, including laws on capital markets, public companies, commercial banking, and investment promotion. Most significantly, the Securities Exchange of Thailand Act (1974) created the basis for the first government-sponsored securities exchange in the country. The new securities law was based on a WB study recommending that Thailand establish securities regulatory regime patterned on the US system (Maolanond & Yasuda, 1985). These recommendations were implemented through the securities legislation and the new Public Limited Company Act (1978).

Second, during the early 1970s there was a great variety in the form and content of financial statements, resulting from the lack of uniform accounting standards (Holzer & Tremblay, 1973). Since financial accounts were traditionally prepared by family-held or state-owned enterprises the diversity did not appear to cause major concern to capital providers. However, the deregulation of banking and creation of an organized stock exchange in 1975 raised the level of public visibility of corporate financial statements. In 1979, the Ministry of Commerce, in consultation with ICAAT, issued minimum disclosure regulations for certain types of highly visible entities such as commercial banks, insurance companies, securities and finance companies. Apparently, these regulations were ineffective in disclosing the true financial condition of Raja Finance, one of the largest companies listed in the Thai stock exchange. It collapsed in early 1979, apparently due to certain undisclosed liabilities (Rowley, 1987). The resulting scandal was very damaging to the government authorities and accountants. It also cast doubt on the government's ambition to transform Bangkok into a regional financial center. Shortly, thereafter, in September 1979, five new accounting standards were issued by ICAAT dealing with fundamental accounting assumptions, the full disclosure of accounting policies, accounting for extraordinary items, accounting changes and earnings per share (Tay, 1994b).

The establishment of these new accounting standards under the name of ICAAT could be viewed as an important shift in accounting regulation in Thailand. Hitherto, all regulations concerning accounting matters were issued under the official imprimatur of the state, through the Ministry of Commerce and Board of Supervision of Auditing Practice. Almost overnight, however, the role of accounting standard setting was placed squarely on the shoulders of the professional accounting body even if ICAAT lacked the full support of licensed auditors. One interpretation would be that following the Raja Finance debacle, state agencies found it advantageous to reduce their exposure to adverse developments by sharing the burden for regulatory failure with a private sector agency. The stronger visibility attached to accounting standard setting was a significant boost to ICAAT's stature, placing it on par with other professional accountancy bodies in ASEAN which had already issued their own standards. Initially, the standards were developed by ICAAT without directly using IASs. Subsequent standards, however, increasingly made use of IAS material such that by 1993, 14 out of the 25 standards issued were IAS-based. Unlike accounting bodies in Malaysia and Singapore which explicitly broadcast their adoption of IASs, ICAAT did not formally acknowledge the use of IASs in its domestic standards but simply incorporated parts of IASs into some of its accounting standards without fanfare. ICAAT was also very selective and borrowed less (compared with Malaysia or Singapore) in terms of total number of IASs and specific portions of individual IASs used. This could be because historically, Thailand has been very selective in adopting models from the West to suit its own perceived needs. The process of adoption also indicates a high amount of deliberation and caution, perhaps drawing on an unstated criterion of adopting only those concepts, which were clearly relevant to local circumstances. For example, in regard to accounting for leases, ICAAT did not adopt the IASs but instead developed its own standard based on traditional Thai hire-purchase arrangements. In general, however, the degree of flexibility inherent in IASs and its adherence to Anglo-American accounting concepts were characteristics which made these standards compatible with the Thai environment.

5. SUMMARY AND CONCLUSION

Prior research on accounting development in countries tends to focus narrowly on functional aspects of the accounting craft. The issue of accounting harmonization, for example, has been debated in technical terms concerned with which standards to adopt and how best to implement these standards on a worldwide basis. Largely ignored, however, are the broader political economic and cultural dimensions of accounting in different nation states.

In contrast, our aim in this paper was to suggest an alternative way of conceptualizing policy debates in international accounting, particularly in the context of developing countries. Specifically, the paper emphasized the historically contingent role of accounting within the nexus of domestic and global interests. Accounting was asserted to be not only a purveyor of financial information but part of the infrastructure necessary to create, sustain and legitimate arrangements for capitalist exchange. Four methodological guidelines were also proposed to facilitate the conduct of research in international and comparative aspects of accounting.

We applied these methodological guidelines in analyzing the development of accounting regulation during the post-colonial era of five ASEAN nation states. Our analysis highlighted how the rise of accounting in post-colonial ASEAN has been linked closely with the historical context in which each country pursued various notions of modernization. Accounting figured prominently in discourses over development, pronouncements of state, multinational agencies and the accounting profession. The developmental contribution of accounting is viewed in terms of catering to enterprise information needs (e.g., effective management) and macro level needs (e.g., tax administration and economic planning). Such an analysis requires an understanding of how the adoption of foreign accounting concepts, including IASs, reinforces dominant political and economic interests and is probably the only short-term viable option given these countries' relatively late entry into the global capitalist economy.

Consistent with the methodological framework, our analysis also showed that international agencies such as the WB and IMF have had an important influence on accounting development in ASEAN. First, these institutions generally recommend the adoption of transparent accounting policies in developing countries. Second, they support particular accounting standards through guidelines and terms attached to borrowing arrangements. The WB (1982, p. 12) guidelines on accounting policies and standards provide that "the Bank prefers that the project accounts are maintained in accordance with generally accepted international standards." Moreover, these institutions generally require that the independent audit be performed by a multinational auditing firm. Third, these institutions provide loans and grants to developing countries to upgrade accounting educational and training capabilities. The WB's commitment to Indonesian accounting development is a case in point.

Our analysis shows also that ASEAN countries have played a crucial role in the development of accounting practice. First, in all five ASEAN states, accounting is recognized officially as a profession, the practice of which requires licensing and state regulation. Generally, however, practicing accountants were required to be members of the officially recognized professional accounting bodies in each country (except for Thailand where licensed auditors do not have to be members of ICAAT). The accounting profession has also been co-opted in various corporatist arrangements with the state for the formulation of financial reporting requirements. Accounting professionals have also generally enjoyed significant prestige in these societies, often playing influential roles in the state apparatus as policy advisers, bureaucratic officers, legislators and cabinet members.

The rise of accounting in ASEAN was not an unmitigated success, however, and was subject to shifting arenas of conflict and co-operation with elements of the state, market and community. Several instances highlight these tensions. The history of the profession in Malaysia features tensions between the state's ethnic policy and the fact that the earliest professional body in that country was perceptibly associated with Chinese Malaysians. Ethnic conflicts in the accounting realm are repeated in other countries, including Indonesia and the Philippines. Deep-rooted sentiments of nationalist pride preclude overt adoption of standards from particular colonial countries, such as British, American or Dutch accounting standards, even if domestic ASEAN standards are substantively modeled on these foreign standards. For example, Thailand used a piecemeal approach to adopting IASC and US standards, borrowing selectively from these sources to build up its own version of accounting standards. In Malaysia and Singapore, IAS adoption was abetted by the neutrality associated with having global standards even if IASs are, in reality, strongly anchored in the Anglo-US model of accounting. While the five ASEAN countries included here appear to exhibit similar propensities towards a capitalist-driven developmental strategy, significant qualitative differences exist regarding the roles of various political actors. Attention was drawn to conflicts and tensions in each country defined along the political, economic and racial-ethnic lines.

We recognize that comparative research in accounting on emerging economies is at a relatively early stage. In this paper, we have drawn attention to some of the methodological and paradigmatic issues of conducting research in these countries. We believe that this approach helps provide a better understanding of the domestic and international forces that shape domestic accounting systems.

NOTES

1. See Wallace and Gernon (1991) for a review of this literature.
2. Since all the countries in our study were significantly impacted by the Asian economic crisis that began in 1997 we limit our analysis to that point. Regulatory and other changes in response to the crisis are beyond the scope of this paper, since they are likely to be a response to that particular event.
3. Since most of our analysis predates the conversion of the IASC into the International Accounting Standards Board (IASB), in our discussion we refer to the IASC as the global standard setter.
4. See Saudagaran and Diga (1999) for a recent critique of the comparative international accounting literature.
5. The 'domino principle' was a political theory that Southeast Asian states would fall under the sway of communism unless the US and other Western countries intervened heavily to arrest such influence.
6. The discussion related to accounting education and the development of the accounting profession in Indonesia is based on numerous interviews with accounting academics at Indonesian universities and partners in the large Indonesian public accounting firms. These interviews were necessitated by the general absence of English language literature on these issues and were conducted by the first author during several visits to Indonesia.
7. In response to such criticism, the WB provided US$165 million in 1985 to establish a Coordinating Agency for Accounting Development (CAAD) which operated as a joint undertaking of the Ministry of Finance and Ministry of Education. The task of CAAD was to (i) implement the first phase of a modernized government accounting system; (ii) improve government auditing services; (iii) raise the quality of

accounting staff; (iv) increase the scope and efficiency of the capital market; (v) strengthen the role of the professional association of accountants and introduce a series of accounting standards; (vi) improve the quality and management of accounting education; (vii) expand accountancy training capacity in higher education and non-formal education.

8. The FRA 1997, discussed later in this section, represented a major push in this direction.

9. Three state regulatory agencies (the SEC, the Central Bank, and the Board of Accountancy) and a member from the Financial Executives Institute of the Philippines (FINEX) filled the other four spots on the ASC.

10. The membership of the Council, SSA's governing body, reflects the corporatist character of decision-making within the professional body: four public accountants, in practice as partners or sole proprietors of accounting firms; four registered accountants, in commerce, industry or government service; the Accountant General; a Ministry of Finance representative; and a representative from the NUS.

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CORPORATE MANDATORY DISCLOSURE BY FINANCIAL INSTITUTIONS IN UGANDA

Samuel Sejjaaka

ABSTRACT

This paper reports the results of a study on corporate mandatory disclosure in Uganda. It focuses on corporate mandatory disclosure in the financial sector, which is defined to include banks and insurance companies. The findings show that there is a significant correlation between relative mandatory scores (RMSs) for disclosure by financial institutions and auditor type (Big-Four versus non-Big-Four independent audit firms), multinational corporation status, size and number of years in operation (age). The relationship between RMS and leverage, return on equity and liquidity is found not to be significant. When the predictors are regressed against the dependent variable, it is found that auditor type and firm age are the best predictors of disclosure at the 0.01 level of significance. The overall level of disclosure in the sector is also found to be extremely poor regardless of auditor type, and this may be related to a weak regulatory environment.

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1. INTRODUCTION

Corporate financial disclosure has been variously defined by different writers (Cerf, 1961; Singhvi & Desai, 1971; Buzby, 1974; Chandra, 1974; Wallace,1988b; Marston & Shrives, 1991; Gibbins, Richardson, & Waterhouse,1992; Chow and Wong-Boren, 1987, Botosan, 1997; Owusu-Ansah, 1998) as the release outside the organization of information concerning the economic performance, position or prospects of the organization, particularly as measured in monetary terms. It includes measurement, adjustment, quantification and application of accounting rules and any other shaping of data prior to their release and also of any subsequent interpretation. Corporate financial disclosure is a multidimensional array of managed activities, which occur in varying contexts, and has various costs and benefits in factor markets (Gibbins et al., 1992). Disclosure can be mandatory or voluntary.

In Uganda, the Financial Institutions Statute of 1993 (FIS) and the Insurance Statute of 1996 were enacted with the objective of consolidating the law relating to the regulation and control of financial institutions. Despite these laws and the powers they conferred on the regulators to intervene in the affairs of financial institutions, 10 banks and seven insurance companies faced liquidity problems between 1994 and 1999, with five banks and six insurance companies subsequently collapsing. Three banks were saved by the intervention of the Bank of Uganda, new investors and the formation of the Non-Performing Assets Recovery Trust. The collapse of the various FIs can be attributed to several factors including poor asset quality, autocratic Chief Executive Officers (CEOs) and lack of adequate financial disclosure for regulatory purposes. The collapse of the FIs, points to weaknesses in the regulatory regime, which could have been occasioned by inadequate information requirements. It appears that FIs and their regulators failed to understand what constituted adequate corporate mandatory disclosure, and therefore what information would be provided on specific issues requiring regulation, or there may have been 'regulatory capture.'[1] Indeed, the collapse of the FIs critically affected the public's confidence in the financial sector by exposing a contradiction in what the regulators seemed to know or do about the FIs and what the FIs were reporting about their operations.[2]

While there have been several studies over the years that investigated disclosure by firms, few of these studies (see Kahl & Belkaoui, 1981) have investigated disclosure by financial institutions. The exclusion of financial institutions from these studies has been based on the argument that financial institutions are closely regulated and therefore do not provide a useful area of analysis (Owusu-Ansah, 1998, 2000). Despite this argument, financial institutions are very important, and there have been numerous financial crises to warrant investigation of disclosure in FIs. My objective in this paper is to bring FIs into the realm of disclosure studies so as to add to our understanding of the disclosure regime in financial institutions with special emphasis on emerging markets. I also developed a country-specific index[3] for assessing the extent of mandatory disclosure in FIs. This is useful in providing a local benchmark for demanding increased corporate mandatory disclosure in relation to international accounting standards (IASs) and the prudential norms for the financial sector.

2. LITERATURE REVIEW

Corporate mandatory disclosure refers to the presentation in corporate annual reports (CARs) of the information that is required by regulatory authorities including the standard setting board, the stock exchange and securities authorities. Usually, this minimum regulatory requirement is presumed by the regulatory authorities to be sufficient to enable those with interests in a reporting firm to make a reasonable evaluation of the relative risks facing the firm. The minimum level of corporate mandatory disclosure is defined by accounting standards, the law of the country regarding corporations (company law), industrial norms or standards and stock market requirements. Adequate disclosure (to users of financial statements as defined in the International Accounting Standards Board's (IASB's) conceptual framework) in corporate financial reports is a function of the quantity and quality of information disclosed therein, the form in which it is presented, and how frequent and timely public reporting occurs (Owusu-Ansah, 1998) vis-à-vis an established standard.

Mandatory disclosure is the minimum standard of disclosure in CARs expected by the regulatory forces. Regulatory forces have been identified as consisting of the stock market, legislation and accounting practice (Ahmed & Nicholls, 1994). According to Buzby (1974) and Wallace (1988a), disclosure of information in CARs is considered 'adequate' if it is relevant to the needs of users, capable of meeting those needs, and released timely. Owusu-Ansah (1998, p. 609) defines adequate disclosure as the extent (number of items) to which mandated applicable information is presented in annual reports of companies and the degree of intensity to which a company discloses those items in its annual report.

Starting with the pioneering work of Cerf (1961), corporate attributes or characteristics have been used as a basis for explaining the level of disclosure in the CAR. As predictors of the comprehensiveness of disclosure, they have been classified into three categories (Wallace, Naser, & Mora, 1994). The categories are structure-related, performance-related and market-related variables. Structure related variables describe a firm on the basis of its underlying structure – size and gearing. Corporate size variables commonly studied are total assets and turnover, and gearing (debt/equity) ratio. Performance related variables vary from time to time and represent information that may be of interest to accounts users. They include liquidity, earnings return and profit margin. Market related variables are qualitative in nature (Wallace et al., 1994), unlike the previous two categories, which are quantitative. Market related variables might be time-period specific and/or relatively stable over time. They refer to a firm's behavior, which results from its association with other firms in its operational environment. Four variables identified in this category include industry type, ownership structure, listing status and auditor type. Other corporate attributes or characteristics included in disclosure studies are the age and principal accounting officer's qualifications.[4]

2.1. Corporate Size

Size is one of the main corporate attributes considered to determine the level of disclosure. Cerf (1961), Singhvi and Desai (1971), Buzby (1974), McNally, Eng and Hasseldine (1982), Chow and Wong-Boren (1987), Cooke (1989, 1992), Wallace et al. (1994), Abu-Nassar and Rutherford (1995), Raffournier (1995) and Owusu-Ansah (1998) have all found size to be significantly associated with the extent of disclosure in the CAR. Various a priori justifications of size include the cost of information dissemination, and stock market listing of large firms. Information generation and dissemination are costly exercises, and small firms would be hard pressed to economically justify such costs. Large firms have the expertise and resources to produce sophisticated reports, and hence they have a higher level of disclosure. Larger firms are also more likely to need to raise capital through the stock exchange, and the stringent requirements of the stock exchange force them to divulge more information. Chow and Wong-Boren (1987) argue that agency costs increase with the size of the firm, and in order to reduce these costs, managers increase the level of financial disclosure.

2.2. Capital Structure (Leverage)

Capital structure is defined in terms of a debt/equity ratio or leverage of the company. Its study as one of the corporate attributes that have a bearing on disclosure has had mixed results. Different authors have also used varying proxies for capital structure. Chow and Wong-Boren (1987) used a leverage ratio (measured by the nominal value of the firm's total debt divided by the sum of the market value of its equity and the nominal value of the total debt). They found that the leverage ratio was not associated significantly with the extent of voluntary disclosure in Mexico. Belkaoui and Kahl (1978) observed a significant negative relationship between the leverage ratio and the disclosure index. Botosan (1997) reports a negative association between the cost of equity capital and voluntary disclosure. She notes that firms that increase disclosure benefit from a falling cost of equity capital. Craig and Diga (1998) and Ahmed and Courtis (1999), however, report a positive correlation between leverage and disclosure levels. Dumontier and Raffournier (1998) report no significant relationship between disclosure and leverage. The results have thus failed to settle the position on capital structure. Intuitively, one would think that as leverage increases, disclosure level would also increase. This is because debt increases the number of stakeholders who have a strong self-interest in monitoring the disclosures of the firm. Under agency theory, managers who wish to reduce the monitoring costs of debt holders would be compelled to provide more information, which also prevents foreclosure by the debt holders.

2.3. Profitability

Prior studies (Cerf, 1961; Singhvi & Desai, 1971; Wallace & Naser, 1995; Inchausti, 1997; Owusu-Ansah, 1998) identify profitability as capable of influencing the extent of corporate disclosure. These studies argue that profitability is a measure of management performance, and as such management of a profitable company is likely to disclose more information to support its performance-related compensatory schemes. Inchausti (1997) employs signaling theory to argue that management, when in possession of 'good news' due to better performance, is more likely to disclose more information to the stock market. Good news would lead to an increased share price valuation on the stock market. A counter-argument is that unprofitable companies are also inclined to release more information to defend their poor performance (Owusu-Ansah, 1998). Lang and Lundholm (1993) note that the influence of a company's profitability level on disclosure can be positive, neutral or negative, depending on its performance. Proxies used to measure profitability include return on turnover (operational efficiency) and return on capital employed (overall performance).

2.4. Liquidity

Wallace et al. (1994) have argued for a link between the liquidity and the level of disclosure in the CAR. Regulatory bodies as well as investors and lenders are particularly concerned with the going-concern status of companies. Companies that are able to meet their short-term obligations without recourse to liquidation of their assets desire to make this fact known through disclosure in their annual reports (Belkaoui & Kahl, 1978). Liquidity is measured by the quick ratio as it is a more stringent measure of corporate liquidity (Owusu-Ansah, 1998).

2.5. Multinational Corporation Affiliation

Multinational corporation (MNC) affiliation status is believed to positively influence disclosure level, i.e., firms that have MNC affiliation are likely to disclose more information. MNCs are expected to demand more information because of various reasons associated with emerging economies (Owusu-Ansah, 1998). These include political costs associated with the operations of MNC affiliates in these areas, possible abuse of corporate power including tax evasion, transfer pricing, circumvention of exchange controls, discriminatory practices and technology transfer. Furthermore, because of home (developed country) requirements, which are more stringent, MNC affiliates are likely to disclose more information. MNC affiliates are therefore likely to have sophisticated financial reporting systems that facilitate greater disclosure in their CARs. Looking at the issue of disclosure intuitively, one can offer a counter-argument that MNC affiliates have more to hide than disclose because of all the reasons cited above, the argument that MNC affiliates disclose more would prima facie, appear to be absurd. There is abundant anecdotal evidence that MNCs practice discrimination, evade taxes through transfer pricing, degrade the environment and, because of corrupt and weak regulatory environments in emerging economies, engage in various excesses. Examples include Shell in Nigeria and Talisman in Southern Sudan. The assumption that MNC affiliates are good corporate citizens, on which the positive disclosure argument is predicated, is ridiculously presumptuous. (A dummy variable is used to capture MNC status. If a company meets the predefined MNC status criteria, it is assigned the numeric value of 1, and 0 otherwise; Owusu-Ansah, 1998).

2.6. External Auditor Type

The audit firm responsible for reporting to shareholders can significantly influence the amount of information disclosed in the CAR (Belkaoui & Kahl, 1978; Ahmed & Nicholls, 1994; Owusu-Ansah, 1998). The value of an external audit depends on how users perceive auditors' reports in the CAR. This perception is based on the ability of the auditor to detect errors and willingness to properly report those errors. Large audit firms are more likely to report misstatements and errors and to ensure compliance by their clients with statutory and regulatory reporting rules than small independent firms. Larger audit firms invest more to maintain their reputation as providers of quality audit than do smaller firms. They therefore have a larger incentive to report inadequate disclosure. Also, the 'Big-Four'[5] audit firms, which are generally well known, have a choice in the type of clients and work that they undertake, unlike small firms, and are therefore generally independent. Another plausible explanation for this relationship is the fact that large firms have a greater potential exposure to legal liability, and this provides further incentive for greater disclosure. The consequences as we have seen in the case of Arthur Andersen can be catastrophic. While Ahmed and Nicholls (1994) found audit firm size to be a significant influence on disclosure, Owusu-Ansah (1998) finds that it did not have a significant impact on disclosure.

2.7. Company Age

It is argued that older, well-established companies are likely to disclose more than younger companies do. Younger companies suffer competitive disadvantage through early disclosure or proprietary information. The cost of collecting and processing information may also be a contributory factor to less disclosure by younger companies (Owusu-Ansah, 1998). New companies do not have a disclosure 'track record' and therefore have diminished incentives to disclose. The premise on which this diminished incentive is based appears to be the fact that any additional disclosure, beyond what is currently disclosed, raises the expectations bar for users. A company would thus be expected to continuously improve its disclosures with the passage of time in accordance with this expectation. A corollary to this premise is the fact that older companies may also disclose more simply because they have more information available on the basis of their rich history.

These attributes have been studied by various authors, with conflicting results. Wallace et al. (1994, p. 43) have argued that the variations in findings are possibly a result of variation in sample size, different statistical methods, different research settings and differences in index construction. Ahmed and Courtis (1999) have also noted the variation in results and carried out a meta-analysis to investigate these variations and draw more consistent conclusions. They found that larger firms disclose more information than do small firms, and this result was significant. Stock exchange-listed firms report more information than do unlisted firms, while firms with a higher leverage have significantly higher information disclosure. Profitability and audit firm size are not significantly associated with aggregate disclosure levels. Ahmed and Courtis's (1999) findings appear to support the political and agency cost hypotheses that larger firms are more likely to disclose more information. This corroborates with Hirshleifer and Riley (1979), who observed that the institutional context of unquoted firms does not guarantee disclosure. It is also worth noting that different environmental and regional considerations, including accounting standards and state laws, play a significant role in the determination of what constitutes adequate of disclosure (voluntary or otherwise).

3. THE BANKING CRISIS OF THE 1980S AND 1990S

The decades of the 1980s and 1990s witnessed the collapse of financial institutions at an unprecedented level worldwide. This banking crisis was experienced in at least 73 percent of the International Monetary Fund (IMF) member countries between 1980 and 1996 (Lindgren, Garcia, & Saal, 1996). In Africa and Asia, this figure was as high as 90 percent. Banking crises are a major concern because they exacerbate downturns in economic activities, prevent savings from flowing to their most productive use, reduce the availability and increase the cost of credit to small and medium-sized firms and seriously constrain the flexibility of monetary policy (Goldstein, 1997). Bank losses or public-sector resolution costs amounted to 10 percent or more of gross domestic product (GDP) in many of the developing countries in which they occurred (Caprio & Klingebiel, 1996). The crises depress growth and foreign trade, strain debt servicing capacity and eventually wind up as liabilities of developing country governments. These crises also increased volatility in terms of trade, cost of borrowing on international markets, private capital flows, real exchange rates, and growth and inflation rates. The banks, therefore, faced higher credit and market risk.

Fraudulent and misleading financial statements may have been published to the detriment of depositors and stakeholders, while corporate officers covered up their dishonesty by not (possibly) disclosing the institutions' financial affairs (Benston, 1969). False or biased information about the institutions could have been disseminated because of inadequacy of the disclosure requirements and the lack of expressly defined national financial reporting standards. It is thus important to assess the adequacy of information in financial statements as a basis for making policy prescriptions for reporting in the financial sector. Several writers have documented the origins of these banking crises. They include Caprio and Klingebiel (1996) and Goldstein (1997), who pointed out several shortcomings such as inadequate preparation for liberalization, government involvement in the banking sector, connected lending, and weaknesses in financial disclosure. This study focuses on the last shortcoming.

As a result of the tumult in the financial sector, the Bank of Uganda introduced policies, regulations and guidelines for financial institutions in 1993. These guidelines (generally referred to as prudential norms) included capital adequacy, asset quality, limitations on lending to a single borrower, limitations on credit to insiders, reporting requirements to the central bank, and bank liquidity.

Capital adequacy requirements under Ugandan law (FIS, Government of Uganda, 1993) related to the specification of a minimum paid-up share capital, maintenance of a core capital at 4 percent of total risk adjusted assets and maintenance of total capital at 8 percent of total risk adjusted assets. (Between 1993 and 2002, the Bank of Uganda increased the minimum paid-up capital from Uganda shillings 500m/= to Uganda shillings 4b/= as financial institutions collapsed.) Asset Quality guidelines require financial institutions to recognize and provide for problem assets (loans) using a quantitative definition of 'non-performing.' Such assets are classified as substandard (20 percent provision – 90–180 days), doubtful (50 percent provision – 180–365 days) and loss (100 percent – 365 days). Limitations on lending to a single borrower and limitations on credit to insiders are intended to prevent banks from granting or permitting outstanding credit facilities to any of the directors or their immediate families or business enterprises (related interests) or a single individual that in the aggregate exceed 25 percent of the core capital. Reporting requirements to the central bank provide for submission of audited annual accounts – weekly returns on liquidity and monthly returns, which include capital adequacy, income and expense, provision for bad debts, loans and advances, credit exposure and concentration, and credit to insiders. Liquid asset requirements (also referred to as cash reserve requirements) involve maintaining liquid assets equal to or in excess of 20 percent of demand deposits plus 15 percent of time deposits (including savings deposits).

Despite these fairly detailed directives on reporting and disclosure, the Judicial Commission of Inquiry into Closure of Banks (Government of Uganda, 2000, p. 1–1) found massive instances of accounting impropriety in the closed banks. The three banks that were investigated were found to have 'incredibly bad corporate governance, persistent under-capitalization, imprudent credit practices and consistently weak supervision.' All the three FIs investigated by the commission were insolvent and had been so for most of the time they operated. According to the report of the commission, Cooperative Bank, in its long and inauspicious life as a commercial bank, had always been inadequately capitalized. Its core capital was negative, and thus it was illegal for the bank to operate as a commercial bank. International Credit Bank's financial statements included assets that the bank did not own. One of these assets – a family home –remained in the accounts for seven years (1992–1999). Greenland Bank Limited (GBL) also had capitalization difficulties. The bank embarked on 'intricate accounting gimmicks' by which it sought to, and succeeded in, misinforming and misleading the Bank of Uganda. In particular, it was claimed that a portion of its headquarters property was sold to one of its prominent shareholders and that the proceeds of that sale (Uganda shillings 2.5 billion) were then turned into new shares, allotted to all shareholders pro rata. This action magnified the company's capital from Uganda shillings 1.1 billion to Uganda shillings 3.6 billion, yet there was no resolution authorizing such allotment nor did the shareholder in question have any recollection of such a transaction (p. 1-4). The catalogue of unethical behavior by the FIs included poor asset quality resulting from massive insider lending, poor accounting for interest on non-performing assets, intermittent liquidity problems, several off-balance sheet items and weak audit functions (internal and external). These banks also suffered from the lack of a strong board and the one-man management syndrome.

4. METHODOLOGY

4.1. Sample Size

There were 26 banking institutions[6] and 17 insurance companies in Uganda at the time of the study. All these organizations were contacted physically to provide a copy of their annual report for the year ending December 2001 or thereafter. The regulators were also contacted to provide a copy of the annual reports filed with them by those institutions that were regulated under various forms. A positive response was received from 35 (81 percent) organizations. These consisted of 21 banking institutions and 14 insurance companies. (Three insurance companies were partly inoperative and could not respond.) The regulators refused to provide any information regarding annual accounts filed with them. According to the Bank of Uganda, the information they received from banks was for regulatory purposes. The Uganda Insurance Commission claimed that the Insurance Statute of 1996 did not allow them to provide the requested information. Both claims were simply bureaucratic denials of cooperation because the information requested was in the form of annual reports, which should be published in the newspapers.

4.2. The Theoretical Model

The following theoretical model was derived for regression analysis after a review of the literature and consideration of the fact that it was not practicable to use some of the variables reviewed for analysis of disclosure in the Ugandan context.

$$RMS_j = \alpha + \beta_1 Size_j + \beta_2 Leverage_j + \beta_3 Profit_j + \beta_4 Liquid_j + \beta_5 MNC_j + \beta_6 Audit_j + \beta_7 Age_j + \mu_j$$

where RMS is the relative mandatory score discussed below; $\alpha =$ intercept; β_1, β_2, β_3, β_4, β_5, β_6 *and* β_7 are coefficients; and $\mu_j =$ error term.

The predictor variables in the theoretical model are described in Table 1.

Leverage and age were transformed into logarithmic values to avoid a ceiling effect arising out of excessive variation in size of the institutions included in the study (Owusu-Ansah, 1998; Gardner, 2001). This study also adopted the index approach, which was first used by Cerf (1961). The approach has been adopted and used in several studies (see Singhvi & Desai, 1971; Buzby, 1974; Barrett,1976; Chow and Wong-Boren, 1987; Wallace,

Table 1. Predictor Variables Derived from Structure-, Performance- and Market-Related Variables.

Predictor Variable	Operational Definition	Notation	Variable Type	Proxy of Variable
Firm size	Value of total assets	$Size_j$	Interval	Log of total assets
Leverage	Debt/equity ratio	$Leverage_j$	Ratio	Debt/equity ratio
Profitability	Return on turnover (this variable is omitted as explained in the results and discussion section) Return on equity	$Profit_j$	Ratio	Ratio of profit before tax to income Ratio of profit before tax to equity
Liquidity	Ability to fund at reasonable cost all contractual obligations in the normal course of business Advances to deposits ratio; cash and cash-equivalents to customers deposits	$Liquid_j$	Ratio	Ratio of current assets to current liabilities
MNC affiliation status	Effective control by a multinational company; ownership of more than half of the share capital by a mutinational company	MNC_j	Categorical	1 if affiliated to MNC, 0 otherwise
Auditor type	Whether auditor is Big-Four member or otherwise	$Audit_j$	Categorical	1 if big four, 0 otherwise
Firm age	Number of years in operation	Age_{j}	Interval	Log of actual number of years in business

1988b; Cooke, 1989; Raffournier, 1995; Botosan, 1997; Owusu-Ansah, 1998). The approach has several advantages. First, it is capable of tapping differences in magnitude of financial reporting by companies. Second, it enables the rank-ordering of sampled companies relative to each other.

Third, the scores on an index can be treated as a parametric or non-parametric data set, which increases the power of analysis. Despite this widespread usage, the technique is susceptible to bias at the scoring stage. This is mainly a researcher-related problem (Marston & Shrives, 1991), which can be minimized by having other colleagues score the same annual reports for comparison. Another limitation is where companies differ significantly on the information items disclosed. Companies may earn similar scores if the number of sub-items is the same even when the actual content of the disclosures is fundamentally different. This, however, does not decrease the efficacy of the index because, generally, companies that appear to have similar scores will have similar disclosure practices.

My aim is to capture the extent and, therefore, the adequacy of mandatory disclosure in annual report and accounts. TheCAR is still one of the most important channels of disclosure for a company. The information in the CAR is both qualitative and quantitative, financial and non-financial. The information may also be in the form of illustrations, diagrams and graphical presentations.

4.3. Relative Mandatory Score

To measure corporate mandatory disclosure, I use an index whose elements are derived from IASs in line with Owusu-Ansah (1998) and Street and Bryant (2000), FIS (Government of Uganda, 1993), Insurance Statute (Government of Uganda, 1996) and the *Policies and Guidelines for the Licensing of Financial Institutions* (prudential norms) issued by the Bank of Uganda (1993). Two disclosure indexes (one for banks and another for insurance companies) were designed to achieve the following objectives:

(i) quantify both financial and non-financial disclosures and
(ii) apply with consistency to companies in the same category.

Disclosure of an item is mandatory if it is required under a regulatory regime or by IASs issued by the IASB. Mandatory items, therefore, consist of all items required to be disclosed in CARs by IASs, FIS, the Insurance Statute 1996, prudential norms, and the Companies Act. An information item is scored 1 when disclosed, and 0 when not disclosed (Wallace & Naser, 1995), giving equal weighting to all items in the index. This removed the need for judgmental treatment of disclosure items and reduced subjectivity. Where mandated items were not applicable, the problem was solved using the relative index technique (Cooke, 1989, 1992; Raffournier, 1995;

Owusu-Ansah, 2000). The RMS was derived using the following formula:

$$RMS_{ij} = \frac{\sum_{i=1}^{n_j} Fiscore_{ij}}{\sum_{i=1}^{m_j} Fiscore_{ij}}$$

where $Fiscore_{ij}$ = disclosure value of item i of information required of sample j FI; n_j = the total number of mandated information items applicable to the specific sample j FI actually disclosed; m_j = the total possible number of mandated information items applicable to the specific sample j FI and expected to be disclosed.

Two disclosure indexes were developed for banks and insurance companies, respectively. The indexes contained several items in two sections covering (a) mandatory disclosures based on IASs and (b) other requirements derived from law and regulatory requirements.

4.4. Reliability and Validity

The reliability of the disclosure index was established by requesting different independent persons to score 10 randomly selected annual reports. The index should be reliable if it generates consistent measures for each randomly selected sample company on different occasions (Owusu-Ansah, 1998, 2000). When the scores of the independent scorer were compared with my scores, they were found to have a Pearson product moment correlation coefficient = 0.871, p-value < 0.01, indicating a high degree of reliability (Owusu-Ansah, 1988). Validation of the index was carried out by requesting four independent auditors associated with FI audits to evaluate its relevance to the reporting requirements in IASs and the law (content validity). The adjusted index was then used in the study.

FIS (Government of Uganda, 1993), the Insurance Statute (Government of Uganda, 1996) and the prudential norms stipulated several disclosure requirements, including the publication of a balance sheet and a profit and loss statement prepared and audited in accordance with generally accepted accounting standards and other regulations, directives, policies or guidelines as the regulator may issue. Such accounts, along with other periodic returns, were to be submitted to the regulator or published in local newspapers within a period of four months from the end of the financial year.

4.5. Data Analysis

For my data analysis I used SPSS Version 10.0^{TM}. I derived descriptive statistics including measures of central tendency (arithmetic means) and dispersion (standard deviations) to observe the data's goodness of fit. A zero-order correlation matrix was calculated to examine the relationship between the independent variables and to assess the tolerance (collinearity) amongst the predictor variables. Following Singhvi and Desai (1971) and Owusu-Ansah (1998), I used a multiple ordinary least squares (OLS) regression model to examine the impact of the different firm-specific determinants on corporate disclosure. Two regressions were derived using the enter and forward selection methods to examine the relationship between the predictor and dependent variables.

5. RESULTS AND DISCUSSION

Descriptive statistics for the dependent and independent variables are reported in Table 2.

The descriptive statistics show that there is a wide variation in the measures for the debt/equity ratio, the return on equity and the acid test ratio. This variation is expected in an industry that is recovering from a crisis and may also be a function of the financial stability of the firms, but it may have a ceiling effect (Gardner, 2001) on the results of the regression analysis. The liquidity ratios of the banks were also very high (in the region of 2:1 on average), indicating that at the time of the study, banks had adopted a conservative attitude to lending. Most banks also have huge holdings of Treasury bills, which are risk free, while capital adequacy and loan loss

Table 2. Descriptive Statistics for Modeled Variables.

	Minimum	Maximum	Mean	Standard Deviation
RMS (Relative mandatory score)	17.14	61.30	40.5020	10.73649
Leverage (proportion of debt to equity)	−490.65	435.70	94.0693	135.51292
Return on turnover	−120.85	48.39	10.9226	32.6764
Return on equity	−259.42	48.80	3.4143	49.9547
Liquidity (Current ratio)	14.19	951.93	207.0274	206.6392
MNC affiliation status	.00	1.00	.3143	.4710
Big-four/non-Big-Four	.00	1.00	.6857	.4710
Firm size (log of total assets)	6.96	13.78	9.9413	1.7678
Firm age (log of total years of operation)	1	89	18.00	19.86

provision requirements had forced banks to significantly curtail private sector lending.

A zero-order correlation for all forms of the predictor variables and the criterion variable was calculated.[7] The results revealed that the return on turnover and return on equity (both measures of profitability) have a significant correlation of 0.896 ($p<0.01$), indicating a high degree of collinearity among these variables. Similarly, the return on turnover and return on equity were found to have a significant relationship with the log of total assets and the acid test ratio at the $p = 0.01$ and $p = 0.05$ levels, respectively. The partial correlation (when all variables were included) of the return on turnover was -0.145, while that of the return on equity was 0.232 with respect to RMS, implying that the latter was a better predictor. Regression analyses using the two variables on a mutually exclusive basis were also carried out using the enter method. The return on equity was found to have more explanatory power ($R^2 = 0.67$). Accordingly, the return on turnover was dropped from the final model. The zero-order correlation reported here (Table 3) therefore excludes the return on turnover.

The MNC affiliation status ($r = 0.456$, $p<0.01$), auditor type ($r = 0.810$, $p<0.01$), firm size ($r = .337$, $p<0.05$) and firm age ($r = 0.406$, $p<0.05$) had a significant correlation with RMS. This is not surprising because MNCs usually have more stringent requirements for disclosure as publicly traded companies. The positive relationship between auditor type (which in many instances is associated with audit quality) and RMS may be attributed to the possibility of greater independence (Singhvi & Desai, 1971; Wallace et al., 1994). MNC affiliation status and auditor type are also significantly correlated ($r = 0.458$, $p<0.01$), possibly because MNCs have a preference for Big-Four auditors. These auditors have a global network of offices and presence in Western financial centers, making their practices more acceptable to Western-based MNCs. Firm size (size) and firm age are also significantly related to RMS. This confirms the hypothesis that large and older firms are likely to disclose more than small and young firms.

Two regression analyses were carried out using the enter method and the forward selection method. The objective was to (1) establish a prediction equation for the corporate attributes in Table 1 and (2) to determine which firm-specific attributes are good predictors of mandated disclosure. The results of the two regressions methods are shown in Tables 4 to 10.

Table 4 is a summary of the OLS regression result using the enter method, which is the model using all corporate attributes as predictors of RMS. The multiple correlation of RMS with the predictors is .848 and $R^2 = .719$.

Table 3. Zero-Order Correlation Matrix for Predictor Variables.

	RMS(Relative mandatory score)	Leverage (Proportion of Debt to Equity)	Return on Equity	Liquidity (Acid Test Ratio)	MNC Affiliation Status	Auditor Type (Big-Four/Non-Big-Four)	Firm Size (Log of Total Assets)	Firm Age (Log of Total Years of Operation)
RMS(Relative mandatory score)	1							
Leverage (proportion of debt to equity)	–.112	1						
	(.524)							
Return on equity	.148	.601**	1					
	(.397)	(.000)						
Liquidity (acid test ratio)	–.285	–.001	–.008	1				
	(.097)	(.997)	(.963)					
MNC affiliation status	.456**	.062	.128	–.119	1			
	(.006)	(.722)	(.465)	(.498)				
Auditor type (Big-Four/non-Big-Four)	.810**	–.156	.005	–.336*	.458**	1		
	(.000)	(.371)	(.976)	(.048)	(.006)			
Firm size (log of total assets)	.337*	.238	.479**	–.396*	.264	.320	1	
	(.047)	(.169)	(.004)	(.019)	(.125)	(.061)		
Firm age (log of total years of operation)	.406*	.082	.245	–.111	.196	.264	.307	1
	(.015)	(.641)	(.156)	(.527)	(.259)	(.125)	(.073)	

Note: Figures in parentheses represent level of significance.
**Correlation is significant at the 0.01 level (two-tailed).
*Correlation is significant at the 0.05 level (two-tailed).

Table 4. Summarized Regression Results Using Enter Method.

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.848[a]	.719	.646	6.38955

[a]Predictors: (constant), firm age (log of total years of operation), leverage (proportion of debt to equity), liquidity (acid test ratio), MNC affiliation status, firm size (log of total assets), auditor type (Big-Four/non-Big-Four), return on equity.

Table 5. Analysis of Variance for Regression Results from Enter Method.

Model 1	Sum of Squares	df	Mean Square	F	Sig.
Regression	2816.940	7	402.420	9.857	.000[a]
Residual	1102.313	27	40.826		
Total	3919.253	34			

[a]Predictors: (constant), firm age (log of total years of operation), leverage (proportion of debt to equity), liquidity (acid test ratio), MNC affiliation status, firm size (log of total assets), auditor type (Big-Four/non-Big-Four), return on equity.

Table 5 reports an F-ratio (9.857) that is significant at the 0.01 level. Table 6 reports the regression coefficients. The results show that only auditor type is a significant ($p < 0.001$) contributor to the model. Auditor type also has the biggest partial correlation (0.726), followed by firm age (0.293) and return on equity (0.228).

The results in Tables 7 and 8 show that auditor type ($R^2 = 0.656$) is the best single predictor of RMS when the regression analysis is recomputed using the forward selection method. When age (log of total years) is added, R^2 improves to 0.695 (Adj$R^2 = .676$). The F-statistics for both models in Table 7 are significant at the 0.01 level. This predictive power of the two models in Table 7 is confirmed by the partial correlations, which are shown in Table 9. The partial correlation for auditor type is highest (0.810), followed by firm age (0.340). Table 10 provides details of the excluded variables for the two forward selection models, including collinearity diagnostics (tolerance and variance inflation factors), all of which are within the acceptable range (Gardner, 2001).

Table 6. Regression Coefficients from the Enter Method.

Model	*B*	Standard Error	Beta	*T*	Sig.	Correlations			Collinearity Diagnostics	
						Zero Order	Partial	Part	Tolerance	VIF
(Constant)	27.476	8.804		3.121	.004					
Leverage (proportion of debt to equity)	–1.E-02	0.010	–1.21	–.921	.365	–.112	–.174	–.094	.606	1.650
Return on equity	3.818E-02	0.31	.178	1.216	.234	.148	.228	.124	.488	2.050
Liquidity (acid test ratio)	–2.E-03	0.006	–.030	–.258	.798	–.285	–.050	–.026	.755	1.320
MNC affiliation status	2.049	2.675	.090	.766	.450	.456	.147	.078	.757	1.320
Auditor type (Big-Four/non-Big-Four)	16.019	2.923	.703	5.481	.000	.810	.726	.559	.634	1.580
Firm size (log of total assets)	–4.67	1.906	–.033	–.245	.808	.337	–.047	–.025	.561	1.780
Firm age (log of total years of operation)	4.311	2.707	.176	1.593	.123	.406	.293	.163	.851	1.180

Table 7. Summarized Regression Results Using Forward Selection Method.

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.810[a]	.656	.645	6.39412
2	.834[b]	.695	.676	6.10690

[a]Predictors: (constant), auditor type (Big-Four/non-Big-Four)
[b]Predictors: (constant), auditor type (Big-Four/non-Big-Four), firm age (log of total years of operation).

Table 8. Analysis of Variance for Regression Results from Forward Selection Method.

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2570.054	1	2570.054	62.861	.000[a]
Residual	1349.199	33	40.885		
Total	3919.253	34			
2 Regression	2725.838	2	1362.919	36.545	.000[b]
Residual	1193.415	32	37.294		
Total	3919.253	34			

[a]Predictors: (constant), auditor type (Big-Four/non-Big-Four).
[b]Predictors: (constant), auditor type (Big-Four/non-Big-Four), firm age (log of total years of operation).

6. CONCLUSION

I have reported in the paper that for FIs in Uganda, MNC affiliation status ($r = 0.456$, $p < 0.01$), auditor type ($r = 0.810$, $p < 0.01$), firm size ($r = .337$, $p < 0.05$) and firm age ($r = 0.406$, $p < 0.05$) are significantly correlated with RMS. Leverage ($r = -0.112$), return on equity ($r = 0.148$) and liquidity ($r = -0.285$) do not have a significant relationship with RMS. Some of these results are in line with some of the findings in the extant literature, while others are contradictory.

The findings on MNC affiliation status and firm age replicate the findings of Owusu-Ansah (1998), while that on auditor type does not. The result of the auditor type variable is in consonance with the findings of Belkaoui and Kahl (1978) and Ahmed and Nicholls (1994). Firm size as measured by the log of total assets has previously been reported to be a significant

Table 9. Regression Coefficients from the Forward Selection Method.

Model	*B*	Standard Error	Beta	*t*	Sig.	Correlations			Collinearity Diagnostics	
						Zero-Order	Partial	Part	Tolerance	VIF
1. (Constant)	27.476	1.928		14.443	.000					
Auditor type (Big-Four/non-Big-Four)	18.459	2.328	.810	7.928	.000	.810	.810	.810	1.000	1.000
2. (Constant)	23.406	2.847		8.221	.000					
Firm age (log of total years of operation)	5.057	2.474	.207	2.044	.049	.406	.340	.199	.930	1.075

Table 10. Variables Excluded from Regression Using Forward Selection Method.

Model	Beta in	t	Sig.	Partial Correlation	Tolerance	VIF	Minimum Tolerance
1							
Leverage (proportion of debt to equity)	.15[a]	.143	.887	.025	.976	1.025	.976
Return on equity	.143[a]	1.425	.164	.244	1.000	1.000	1.000
Liquidity (acid test ratio)	–.014[a]	–.129	.898	–.023	.887	1.127	.887
MNC affiliation status	.108[a]	.938	.355	.164	.790	1.266	.790
Firm size (log of total assets)	.087[a]	.807	.426	.141	.898	1.114	.898
Firm age (log of total years of operation)	.207[a]	2.044	.049	.340	.930	1.075	.930
2							
Leverage (proportion of debt to equity)	–.011[b]	–.110	.913	–.020	.959	1.042	.899
Return on equity	.099[b]	.985	.332	.174	.936	1.068	.871
Liquidity (acid test ratio)	–.009[b]	–.087	.931	–.016	.887	1.128	.835
MNC affiliation status	.089[b]	.803	.428	.143	.784	1.276	.758
Firm size (log of total assets)	.039[b]	.358	.723	.064	.845	1.184	.845

[a]Predictors in the model: (constant), auditor type (Big-Four/non-Big-Four).
[b]Predictors in the model: (constant), auditor type (Big-Four/non-Big-Four), firm age (log of total years of operation).

determinant of corporate disclosure by Cerf (1961), Singhvi and Desai (1971), Buzby (1974), McNally et al. (1982), Chow and Wong-Boren (1987), Cooke (1989, 1992), Wallace et al. (1994), Raffournier (1995) and Owusu-Ansah (1998). Profitability, which is implicated by several authors (such as Inchausti, 1997 and Lang & Lundholm, 1993), does not have a significant influence on RMS in Uganda. Similarly, leverage did not have any significant association with RMS. This supports Chow and Wong-Boren's (1987) finding about Mexican companies. While this relationship was not significant, it was notably negative as hypothesized by Belkaoui and Kahl (1978) and Botosan (1997). Liquidity was also found to have no significant association with RMS, in contradiction with the findings of Belkaoui and Kahl (1978) and Wallace et al. (1994).

When all the corporate attributes in Table 1 are regressed against RMS using the enter method, only auditor type (Big-Four/non-Big-Four) is significant at the 0.01 level. When the regression is recomputed using the forward selection method, auditor status ($p<0.01$) and firm age ($p<0.05$) are found to be statistically significant predictors of RMS.

The above results have several problematic limitations associated with them. The financial sector, prior to the study period, had experienced many upheavals, and various firms were in various stages of restructuring, especially banks. As a result, there are significant variations in their ROE and leverage and liquidity ratios. A number of these firms had received capital infusions from the Central Bank, which they reported as capital. In contrast, the more established banks, which also had MNC status in most cases, had improved their performance as a result of depositors' preferences for stable firms.

The finding that auditor type is the most significant predictor of RMS may also be spurious. Firstly, the two main regulators showed a marked preference for the Big-Four audit firms. Thus, 26 (74 percent) of the companies in the study sample were audited by Big-Four audit firms. The fact that Big-Four audit firms were carrying out the audits did not lead to an increase in the observed level of mandatory disclosure. The average RMS for the whole industry was 39 percent because several important areas were not reported upon, even though it was claimed that the CARs were based on IASs. Reporting in the financial sector was particularly limited by lack of an accounting standard for insurance companies and a weak regulatory regime. It is therefore important to consciously work to increase the usage of IASs, which were adopted in 1999 in order to increase the reliability and credibility of financial sector activities. The disclosure index developed can be used to improve the disclosure and provide a benchmark for regulation in the industry as the companies in the sector move toward public ownership.

NOTES

1. Regulatory capture refers to situations where regulators, instead of carrying out their duties, become agents of the organizations to be regulated and pander to their wishes.

2. Bank supervisors are reported to have been some of the loan-takers from the banks, which eventually collapsed. Such a state of affairs would inevitably compromise their supervisory role.

3. Available from the author on request.

4. In this study, I focus on firm size (total assets), gearing, liquidity, earnings return (profitability as measured by return on equity), MNC affiliation status, auditor type (Big-Four/non-Big-Four) and firm age. This is because it was not practicable to operationalize all the variables. The literature on the omitted variables has been reviewed elsewhere (Sejjaaka, 2003).

5. The Big-Four firms in the case of Uganda are Deloitte and Touche, Ernst and Young, KPMG Peat Marwick, and PricewaterhouseCoopers.

6. Banking institutions include commercial banks, microfinance institutions and investment houses.

7. This zero-order correlation is not shown for reasons of brevity. Return on turnover was dropped from the model because it correlated highly with return on equity (0.896), but its partial correlation in the regression model (with all variables) was –0.145, compared with 0.232 for return on equity when both variables are included in the model.

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THEME 2:
BANKING AND MICROFINANCE LENDING

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ACCEPTANCE OF INTERNATIONAL ACCOUNTING STANDARD-SETTING: EMERGING ECONOMIES VERSUS DEVELOPED COUNTRIES

Nadine A. Fry and Roy Chandler

ABSTRACT

Many emerging economies have either adopted International Accounting Standards (IASs) or used the IASs as a base from which to develop their domestic standards. Yet little attention has been given to the acceptability of the international accounting standard-setting regime itself. This paper investigates what senior executives thought of the former International Accounting Standards Committee (IASC) and its output, the IASs. The findings indicate an apparent enthusiasm for harmonisation from finance directors in emerging economies which is in stark contrast to the ambivalence shown by their counterparts from developed countries.

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1. INTRODUCTION

The process of globalisation has raised international debate about its potential impact on emerging economies. Although it has been argued that globalisation will aid emerging economies, there is nevertheless a suspicion that the primary beneficiaries will be advanced economies. The advent of the "global village" has resulted in the integration of financial markets, presenting significant opportunities for multinational corporations (MNCs) to raise finance on foreign stock exchanges. However, variations in national accounting regulations represent significant impediments to international movements of capital (Tondkar, Adhikari, & Coffman, 1989). The former International Accounting Standards Committee (IASC), now the International Accounting Standards Board (IASB), actively pursues ways of eliminating or reducing such obstacles to achieve the objectives of freer trade and commerce in a world economy (Wyatt, 1989).

Professional accountancy bodies in some emerging economies have either adopted without amendment the core set of International Accounting Standards (IASs) or have adapted the IASs to form national regulations. In some cases this action has been forced upon them by outside agencies such as the International Monetary Fund or the World Bank (Hooper & Morris, 2004; Sucher & Alexander, 2004). Such behaviour raises the question of whether globalisation represents an opportunity or a threat for accounting regulators operating in emerging economies. On the one hand, national adoption and even adaptation of IASs reduces the effort needed to be expended by national standard-setters; this may be of particular importance when resources are scarce. Moreover, some claim that the adoption of IASs results in an improvement in the quality of accounting in less-developed countries (Turner, 1983) and thereby improved competitiveness in the global capital market (Saudagaran & Diga, 2003, p. 241). Furthermore, IASs provide a low-cost option for developing countries and their adoption is easier to justify from a political standpoint as, in theory, they do not reflect the accounting policies of one particular nation (Saudagaran & Diga, 1997). In this regard, IASs may be seen as an opportunity for emerging economies.

However, it cannot be denied that the pronouncements of the IASC appear to have been heavily influenced by major powers, in particular the UK and the US. There may be a threat to emerging economies which inadvertently import inappropriate accounting technologies and philosophies. Collett, Godfrey, and Hrasky (2001), for example, illustrate how the use of rhetoric espousing international harmonisation may mask the intention to pursue a hidden, national agenda. Research into the lobbying of the IASC reflects long-held concerns about attempts to exert influence on the standard-setting process (Brown & Tarca, 2001; Kenny & Larson, 1993, 1995; Larson & Brown, 2001; MacArthur, 1996; Walker, 1978).

Furthermore, the over-representation of developed countries on the IASC board resulted in the tendency simply to address those issues relating to advanced economies (Rivera, 1989). The relevance of IASs and their ability to satisfy the needs of emerging economies is therefore questionable (Daley & Mueller, 1982; Perera, 1989). Samuels and Oliga (1982) argued that the accounting needs of individual countries should be considered as well as the needs of the international business community. Accounting standards based on the environmental conditions of one country are likely to be dysfunctional in another country. Nobes (1995) believed that the harmonisation efforts of the IASC were likely to be most successful in the developed Western economies and in those emerging economics which enjoy close economic links with the West. Many national groups have vested interests in maintaining their own standards (Goeltz, 1991) yet the international harmonisation movement requires some local regulators to give up their national standards in favour of a set of global standards (Choi & Levich, 1990). Some local regulators may surrender their authority only with reluctance, in which case the international standards may be perceived as constituting a form of "accounting colonialism" (Francalanza, 1988; Hove, 1986) or "accounting imperialism" (Turner, 1983). Furthermore, following the IASC's decision to take a more restrictive attitude to permissible accounting alternatives, the potential exists for more conflicts between international and national standards (Street & Gray, 1999). The relative loss of power of individual nations is likely to be seen as yet another example of American hegemony (Hoarau, 1995). Richardson (1987) claimed that "Once hegemony is established, the role of accounting shifts. It becomes a means of 'amplifying power' in the sense that it allows the dominant group to implement its preferences without recourse to the tangible bases of its power" (p. 351).

Hughes (1999) has argued that "we cannot afford to descend into accounting protectionism which would perpetuate accounting differences and capital market inefficiencies" (p. 1). In a similar vein, Chandler (1992) suggested that advantages of adopting international pronouncements outweigh the loss of independence and sovereignty in the context of the setting of national standards.

2. BACKGROUND TO STUDY

Although an overwhelming amount of professional and academic research has been undertaken in the field of international financial reporting, it has focused primarily on the content of IASs, or more recently International Financial Reporting Standards (IFRSs), similarities between IASs and national accounting regimes (e.g. Cairns & Nobes, 2000; KPMG, 2000), and the political processes involved in setting and using IASs (e.g. Wallace, 1990). Relatively little attention has been directed at ascertaining the perceptions of those who are affected by international accounting regulations. A notable exception is the contribution of Watty and Carlson (1998), which advocates a novel adaptation of the "total quality management" philosophy, using its focus on the end user of a product or service to justify surveying investment analysts' opinions on the perceived quality of IASs. Another is the work of Abu-Nassar and Rutherford (2000) who examine the differences between the needs of users of financial information as assessed by the users themselves and the perceptions of users' needs held by preparers.

In fact, the primary end users of the IASs are the preparers of financial statements, yet there appears to be a serious paucity of research into preparers' views on the international standards and the standard-setting process. It is difficult to justify this oversight; the highly respected authority on standard-setting, David Solomons (1986), stated many years ago, "In the last analysis, acceptability is a necessary condition for the continued existence of a private sector [regulatory] agency" (p. 241). More potently, Solomons went on to say "even a public sector agency like the SEC cannot consistently disregard the views of those it regulates"; acceptance amongst the financial community is a necessary prerequisite to the successful implementation of IASs.

To fill the gap in the academic literature, the aim of the current study was to obtain a measure of the acceptance of the IASC and its output. In particular, we were interested to see if preparers in emerging economies had significantly different views to those of their counterparts based in Westernised countries. The remainder of the paper is arranged as follows: Section 3 outlines the research methodology and respondents' background; Section 4 presents the findings of the survey and the authors' discussion thereof; and the paper ends with the study's conclusions and their likely impact on the future of international accounting regulation.

3. RESEARCH METHODOLOGY AND RESPONDENTS' BACKGROUND

Questionnaires were sent to a random sample of 2,150 top companies from both emerging and developed economies chosen from the *Financial Times* surveys (FT, 1999) and the "Dun and Bradstreet Principal International Businesses 1999/00: The World Marketing Directory" (Dun & Bradstreet, 1999). The questionnaire was addressed to the chief financial officer (CFO) of each company, since it was believed that this individual would be in the best position to provide a meaningful response. The authors adopted a "multiwave follow-up" in order to maximise the response rate (Frankfort-Nachmias & Nachmias, 1996). Although respondents were given the opportunity to remain anonymous, none chose to do so, which enabled the authors to send reminders and final reminders only to non-respondents. The authors tested for non-response bias by comparing a sample of answers from early and late respondents; no statistically significant differences were shown to exist between the views of the two groups.

There were 246 respondents in total (46 from emerging economies and 200 from developed countries). Emerging economies included the following countries: Bahrain, Ghana, Greece, Hungary, Israel, Jordan, Kenya, Lebanon, Mauritius, Morocco, Portugal, Saudi Arabia, South Africa, Taiwan, Turkey and Zimbabwe.

4. SUBSTANTIVE RESULTS AND DISCUSSION

We now report the results of the survey.

Current and Future Reporting Regime

It can be seen from Table 1 that the majority of respondents from emerging economies were already part of the IAS regime and from Table 2 that that number looks set to increase by 2005 (we have assumed that those who did not answer were not planning to abandon the IAS regime). Of course, the European Commission's decision to require companies listed in the European Union to comply with IASs by 2005 may have swayed the future plans of some of the developed economies.

Table 1. Existing Accounting Regimes (All Figures Represent Number of Respondents).

Current Accounting Standards	Emerging Economies	Developed Countries
Domestic GAAP (non-US)	10	111
IAS	27	14
US GAAP	1	37
Domestic and US GAAP	1	4
Domestic GAAP and IAS	2	2
Reconciliation to IAS	2	4
Reconciliation to US GAAP	–	23
Other	3	4
No Answer	–	1
Total	46	200

Table 2. Planned Accounting Regimes (All Figures Represent Number of Respondents).

Future Accounting Standards	Emerging Economies	Developed Countries
Domestic GAAP	8	127
IAS within 1 year	1	1
IAS within 2 years	2	4
IAS within 3 years	1	1
IAS within 4 years	1	4
IAS within 5 years	–	5
IAS more than 5 years	1	1
US GAAP within 1 year	–	3
US GAAP within 2 years	–	1
US GAAP more than 5 years	–	1
Other	–	13
No answer	32	39
Total	46	200

Some respondents from emerging economies were prepared to justify their plans regarding their future reporting regime. Three stated that they wished to continue to adopt IASs in order to satisfy their domestic listing requirements. Of those currently using domestic Generally Accepted Accounting Principles (GAAP), one believed that they have no reason to change their current financial reporting status and another argued that it would be too costly to do so. With regard to moving towards IASs, one respondent planned to do so in order to satisfy foreign stock exchange listing requirements, while another believed that IASs represent the way forward and a third simply stated "harmonisation" as their reason.

Among the reasons given by respondents from the "Developed" group, we find more of a US influence including one which boldly stated "US GAAP are of the highest quality".

Perceived Benefits of IASs

There is an extensive literature on the supposed benefits that international harmonisation may provide (e.g. see Choi & Bavishi, 1982; Fleming, 1991; Meek & Saudagaran, 1990; Samuels & Oliga, 1982; Turner, 1983), which were explored by the questionnaire.

As shown in Table 3, there was overwhelming agreement that the programme of international harmonisation has produced significant benefits in terms of improved comparability of companies' financial statements and the general quality of financial reporting. In addition, more than three quarters of respondents thought that IASs increased investor confidence, although a much smaller percentage (approximately half) thought that IASs enhanced the efficiency of capital markets and the international flow of capital. However, only just under a quarter of respondents considered that IASs reduce the cost of preparing financial statements, perhaps because they are considered as more rigorous than previously employed domestic standards and therefore involve greater compliance costs. By and large, respondents from emerging economies were more inclined to agree with the claimed benefits of IASs than their counterparts from developed economies.

Perceptions of the Relative Role of International Standards

The questionnaire contained five statements that sought to ascertain the views of CFOs with regard to the relative roles of IASs. The results are displayed in Table 4. In general, there was a significant level of support for IASs, with the vast majority of those from emerging economies believing that IAS should replace domestic standards.

There is an ongoing debate as to whether IASs should act as benchmarks for national regulations or as regulations only for those MNCs making cross-border capital issues. The International Organisation of Securities

Table 3. Benefits of IASs.

Statement	Emerging Economies						Developed Countries					
	SD	D	N	A	SA	DK	SD	D	N	A	SA	DK
IASs raise the quality of financial reporting	0.0	2.2	0.0	56.5	41.3	0.0	1.6	9.3	17.6	60.1	9.8	1.6
IASs improve the comparability of published financial statements between companies	0.0	0.0	2.2	43.5	52.2	2.2	0.5	7.2	8.8	53.1	29.4	1.0
IASs reduce the costs of preparing published financial statements	13.3	26.7	31.1	20.0	6.7	2.2	11.9	47.9	23.2	7.7	3.1	6.2
IASs increase investor confidence	0.0	6.5	15.2	65.2	13.0	0.0	2.1	10.3	27.2	53.8	4.1	2.6
IASs enhance the efficiency of capital markets	0.0	11.4	31.8	43.2	4.5	9.1	2.6	9.8	35.6	39.2	4.1	8.8
IASs enhance the international flow of capital	2.3	9.1	25.0	45.5	6.8	11.4	3.1	11.9	38.1	36.6	3.1	7.2

Note: SD, strongly disagree; D, disagree; N, neutral; A, agree; SA, strongly agree; DK, don't know.

Table 4. Adoption of IAS (All Figures Shown are in Percentage).

The Role of IASs	Emerging Economies						Developed Countries					
	SD	D	N	A	SA	DK	SD	D	N	A	SA	DK
IAS should replace domestic standards	2.2	13.0	8.7	45.7	30.4	0.0	10.9	26.9	18.7	33.2	8.8	1.6
IAS should be used only by large companies	8.7	50.0	17.4	10.9	13.0	0.0	10.8	46.7	11.3	24.6	5.1	1.5
IAS should be adopted only by global capital markets	8.9	42.2	22.2	13.3	4.4	8.9	10.9	34.7	28.5	22.3	1.6	2.1
Accounting standards should be developed on a regional basis	21.7	50.0	13.0	10.9	4.3	0.0	24.9	48.7	17.6	7.5	0.5	1.0
IAS should be used only by developed countries	26.1	52.2	13	6.5	2.2	0.0	17.5	55.7	18.0	5.2	0.5	3.1

Note: SD, strongly disagree; D, disagree; N, neutral; A, agree; SA, strongly agree; DK, don't know.

Commissions (IOSCO) appears to favour the latter, claiming "the core standards are not intended to affect domestic standards, which are normally used by a broader spectrum of issuers" (IOSCO, 1998, p. 5). However, only a minority of respondents from both constituencies believe that IASs should be adopted *only* by large companies or *only* for global capital markets purposes. Not surprisingly, about 75% disagree with the statement that IASs should be adopted *only* by developed countries. In general, it seems therefore that most of the CFOs believed that if IASs are to be adopted, they should apply universally. This would suggest that the creation of a Big IASs/ Little IASs divide (as foreseen by Nobes, 1998; Wallace, 1990) would not be popular in emerging economies. Indeed, such a tiered approach to standard-setting would appear completely to undermine the original raison d'etre of the IASC. Further evidence of the CFOs' desire to avoid unnecessary tiers of regulation is found in their response to the suggestion that accounting standards be developed on a regional basis.

Perceived Quality of IASs and Their Application

In order to gauge an overall impression of IASs, recipients of the questionnaire were asked to demonstrate their level of support for four statements that considered the quality of IASs (see Table 5), with reference to the features that the US Financial Accounting Standards Board (FASB) identified as essential to the acceptability of an international regulatory framework (FASB, 1998). More than two thirds of respondents from emerging economies believed that IASs represent a set of high-quality standards, are both coherent and well-structured, and represent current best accounting principles. Support for these statements was significantly lower among the respondents from developed countries.

In addition, the questionnaire considered the extent to which the financial information produced under IASs possesses the four characteristics that the FASB (1998) identified as essential for high-quality financial reporting: relevance, reliability, transparency and consistency (see Table 5). *Relevant* information is information that influences the decision-making process and has an effect on the outcome. The information provided must be timely and it must have either predictive value, or feedback value, or both. *Reliable* information is information that is representative, verifiable and objective. To be relevant and reliable, financial information must be *transparent* to the extent that readers can obtain an understanding of the bases on which financial statements have been constructed. Financial statements must also

Table 5. Quality of Financial Reporting (All Figures Shown are in Percentage).

	Emerging Economies						Developed Countries					
	SD	D	N	A	SA	DK	SD	D	N	A	SA	DK
Qualities of IASs												
IASs represent a set of high quality standards	0.0	2.2	6.5	56.5	32.6	2.2	2.1	5.7	23.7	57.7	7.2	3.6
IASs are coherent	0.0	0.0	19.6	71.7	2.2	4.4	2.1	7.7	40.5	42.1	2.1	5.6
IASs are well-structured	0.0	0.0	17.8	71.1	6.7	4.4	1.5	7.2	45.4	34.5	2.6	8.8
IASs are current best accounting principles	0.0	4.3	23.9	52.2	19.6	0.0	5.7	25.8	41.8	19.6	1.5	5.7
Qualities of Information Produced under IASs												
IASs result in consistent financial reporting	0.0	2.2	2.2	56.5	39.1	0.0	1.0	7.7	22.7	55.2	11.3	2.1
IASs result in transparent financial reporting	0.0	2.2	20.0	46.7	31.1	0.0	2.1	10.8	33.5	45.4	6.2	2.1
IASs result in relevant information	0.0	4.3	17.4	58.7	19.6	0.0	2.1	9.3	35.1	48.5	2.6	2.6
IASs result in reliable information	0.0	8.7	10.9	56.5	21.7	2.2	1.5	7.7	39.2	46.9	1.5	3.1

Note: SD, strongly disagree; D, disagree; N, neutral; A, agree; SA, strongly agree; DK, don't know.

be prepared on a *consistent* basis within a company. Although *comparability* is also regarded as an essential quality of financial information, the authors regarded this as one of the primary advantages of harmonisation and the responses to this question are reported in the subsection "Perceived Benefits of IASs".

In general, the results were supportive of the quality of the financial information resulting from the application of IASs. Again, respondents from emerging economies expressed significantly stronger views as to the positive consequences of applying IASs.

Influences on IASs: Perceived and Desired

The literature identifies a number of "participants", "players" or "proponents" in the setting of international accounting regulations (see, e.g. Belkaoui, 1994; Carlson, 1997; Rahman, 1998). Recipients of the questionnaire were initially asked to comment upon the extent to which proponents influence the development of IAS. In order to test whether they thought the existing balance of power was appropriate, the questionnaire also asked recipients to indicate the extent to which they thought that proponents *should* influence the international standard-setting process. A significant difference between the two assessments might raise a question about the acceptability of the standard-setting process. Table 6 provides a detailed breakdown of the results.

Given that respondents themselves were preparers of published financial statements, it is perhaps not surprising that the greatest difference between perceived and desired influence should be in relation to themselves: about equal proportions from both groups believed that preparers *should* influence the development of IASs, whereas only 54.6% and 33.5% from emerging and developed countries, respectively, actually perceived preparers as influential. Respondents from emerging economies therefore appear to view themselves at less of a disadvantage than their counterparts from developed countries.

5. CONCLUSION

Why should we care what those being regulated think of the regulations by which they are governed or those who make the regulations? To answer this question we need only return to the work of Solomons (1986, p. 246) who

Table 6. Perceived versus Desired Role of Proponents of Harmonisation (All Figures Shown are in Percentage).

	Emerging Economies						Developed Countries					
	NI	SI	N	I	EI	DK	NI	SI	N	I	EI	DK
Perceived Influences on IASs												
Professional accountancy bodies	0.0	2.3	2.3	37.2	46.5	11.6	1.0	12.7	10.2	42.6	24.9	8.6
Accountancy firms	0.0	4.5	0.0	52.3	31.8	11.4	1.0	15.9	6.2	44.6	24.6	7.7
Securities regulators	0.0	11.4	6.8	54.5	13.6	13.6	0.0	11.2	11.7	42.1	22.3	12.7
Investment analysts	4.5	4.5	11.4	43.2	18.2	18.2	4.1	22.8	23.4	32.0	7.6	10.2
National standard-setters	2.3	11.4	15.9	38.6	20.5	11.4	1.5	8.6	8.6	45.2	28.4	7.6
Preparers of financial statements	2.3	11.4	13.6	36.4	18.2	18.2	8.6	26.9	21.8	29.9	3.6	9.1
Institutional investors	2.3	6.8	13.6	43.2	13.6	20.5	3.0	21.8	24.9	32.5	8.1	9.6
Government	0.0	13.6	27.3	38.6	4.5	15.9	7.1	17.3	33.7	25.5	7.1	9.2
Desired Influences on IASs												
Professional accountancy bodies	0.0	4.4	4.4	46.7	44.4	0.0	1.5	14.8	8.7	50.5	21.9	2.6
Accountancy firms	0.0	4.4	4.4	46.7	44.4	0.0	2.6	18.7	13.5	52.8	11.4	1.0
Securities regulators	0.0	2.2	13.3	53.3	28.9	2.2	2.0	13.1	18.2	48.0	15.7	3.0
Preparers of financial statements	4.4	6.7	11.1	40.0	35.6	2.2	1.0	11.6	13.6	49.5	22.2	2.0
Investment analysts	2.2	15.6	4.4	48.9	26.7	2.2	5.6	22.8	20.8	38.6	10.7	1.5
National standard-setters	0.0	8.9	13.3	57.8	17.8	2.2	1.5	13.3	9.2	51.0	23.0	2.0
Institutional investors	2.2	15.6	8.9	42.2	26.7	4.4	2.0	25.4	14.2	42.1	14.7	1.5
Government	9.1	18.2	20.5	47.7	4.5	0.0	21.1	23.2	31.4	20.6	2.6	1.0

Note: NI, no influence; SI, some influence; N, neutral; I, influential; EI, extremely influential; DK, don't know.

began the conclusion of his treatise on accounting standard-setting with the following statement: "Before accounting standards can achieve their purpose … they must have a large measure of approval by the financial community – that is, they must be accepted".

Respondents from emerging economies on the whole were more enthusiastic and supportive of the international harmonisation effort. This suggests that if they did regard harmonisation as Western hegemony in disguise, they believed that this was a price worth paying for improved accounting and accountability. Significantly fewer of those respondents from developed countries expressed the same degree of enthusiasm for the international regime, although we must bear in mind the possibility that attitudes may now have changed with the relatively higher profile of both the IASB and its product.

One issue that remains to be dealt with is that of the enforcement of compliance with IASs. Nearly all respondents indicated a desire for active monitoring of countries' domestic standards' compliance with IASs. It has to be said that one of the weaknesses of the IASC's regime was that it lacked an effective enforcement mechanism. The IASC, with no authority over its members, had to rely upon them using their "best endeavours" in the hope that IASs would be adopted (Nobes, 1995). This problem was exacerbated by the fact that in some countries the task of setting national accounting standards fell not to the IASC's members (professional accounting bodies) but to other organisations, most often a government department. The formation of the IASB has not solved the problem; there is still no effective overall mechanism for monitoring compliance. Until this issue is resolved satisfactorily, actual harmonisation will remain a patchy affair.

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THE IMPACT OF CAPITAL REQUIREMENTS ON BANK BEHAVIOR: EVIDENCE FROM JORDAN

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ABSTRACT

Since the 1988 Basel Accord, regulators around the world have increased their focus on the capital adequacy of banking institutions. In this paper, a simultaneous equations model is used to investigate the impact of capital regulation on bank behavior in Jordan. The model is estimated and tested on annual panel data from 12 banks during the period 1980–2002. The results indicate that capital requirements significantly affect banks' capital ratio decisions and that regulatory pressure did not induce banks to increase their capital, but it did positively affect their chosen risk level, which indicates that Jordanian banks constrained by the capital adequacy requirements increase both capital and risk to keep their risk-adjusted capital ratio from falling below the minimum while maintaining their profitability.

1. INTRODUCTION

The capital ratios of many international banks in G-10 countries declined significantly in the 1970s (Jackson et al., 1999; Saunders & Wilson, 1999). In

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an attempt to reverse this decline, bank regulators in several countries issued explicit capital adequacy ratios (CARs), which required banks to hold a fixed percentage of their total assets as capital. Although the introduction of CARs led to an increase in bank capital levels, there was a wave of bank failures in the 1980s. Lindgren et al. (1996) observed that over 130 countries, comprising almost three-quarters of IMF's membership, experienced significant banking problems post-1980. A weakness of the CARs was that they failed to acknowledge the heterogeneity of bank assets and, as a result, banks had an incentive to shift their portfolios from low-risk to high-risk assets. In response to the widespread criticism about declining capital standards of banks and the consequent bank failures, the Basel Committee on Bank Regulatory and Supervisory Practices (BCBRSP) recommended the adoption of risk-related CARs (R-RCARS) as part of the 1998 "Basel Accord." By the end of 1992, most major banks held the required minimum (8%) risk-related ratio.

The primary purpose of R-RCARS was to make bank capital requirements responsive to the risk in asset portfolios of banks. Although capital ratios at commercial banks had increased from 9.3% in 1998 to 11.2% in 1999 after the R-RCARS were introduced, the question arose, "To what extent were these increases a response to the new requirements?"

Many authors have tried to gauge the impact of capital requirements on banks' behavior. Most studies concentrate on US banks (Aggarwal & Jacques, 1997; Calem & Rob, 1996; Hall, 1993; Haubrich, Hancock, & Wilcox, 1993; Jacques & Nigro, 1997; Keeley, 1990; Thakor, 1996; Wachtel, 1993). Evidence relating to European banks is scarcer, with the notable exception of United Kingdom (Ediz, Michael, & Perraudin, 1998) and Swiss banks (Rime, 2000).

This paper uses the model developed by Shrieves and Dahl (1992) to analyze adjustments to capital and risk variables made by Jordanian banks based on a simultaneous equation methodology, which recognizes that changes in both capital and risk have both exogenous and endogenous character. The empirical analysis is based on a unique database. It is found that Jordanian banks maintain the required minimum R-RCARS, as well as their profitability. This implies that banks may have adjusted their portfolios toward riskier assets; it also shows that the regulatory pressure variable has no significant impact on the CARs, but that it does have a significant positive impact on bank risk taking. In addition, there is a significant and positive relationship between the change in capital and the change in bank risk.

The paper is organized as follows. Section 2 briefly reviews the rationale for capital requirements. Section 3 summarizes the recent developments of capital requirements in Jordan. Section 4 introduces the model developed by

Shrieves and Dahl (1992) and its modified form used in this study. It also discusses the data and the empirical methodology. Section 5 presents the results and Section 6 provides a summary and some conclusions.

2. A REVIEW OF RISK-BASED CAPITAL STANDARDS

In July 1988, the BCBRSP adopted a common risk-based capital standard for international banks in member countries. Prior to the implementation of the Basel Accord, banks in the G-10 countries were subject to CARs that mandated them to hold a percentage of their assets as capital, irrespective of the level of risk in their portfolio, and the country-based regulators did not use a common definition of capital.

From December 31, 1990, the R-RCARS replaced the existing capital requirements. The R-RCARS were designed to make capital standards similar across all countries participating on the Basel Committee, and thus to achieve "a level playing field" in international banking while requiring banks to hold capital in accordance with the perceived risk in their portfolios, and also to generally raise capital levels. Hence, the R-RCARS explicitly linked capital to credit risk by assigning risk weights to broad categories of on- and off-balance sheet assets. After assigning assets to the appropriate risk category, each bank calculated its total risk-weighted assets (RWA) as the sum of the value of each asset multiplied by the corresponding risk weight (see appendix). Banks were then required to maintain capital equal to, or greater than, a certain percentage of the total RWA. Under the risk-related standards, capital consists of two parts: Tier-I capital (comprising of equity capital and published reserves from post-tax retained earnings) and Tier-II capital (e.g., comprising perpetual preferred stock, loan loss reserves, and subordinate debt, among others).

An interesting finding of work papers that investigated the impact of capital requirements using partial adjustment models, empirically Shrieves and Dahl (1992) and Jacques and Nigro (1997), is that capital regulation had a significant impact on banks' risk and vice versa, and that the risk-based R-RCARS were effective in increasing capital ratios and reducing portfolio risk in commercial banks. However, in some studies, it is argued that what matters is the regulatory trigger level of capital set by the supervisory authorities. Ediz et al. (1998) examine the behavior of British banks near the regulatory trigger levels, asking the question, "What actions do banks take when their capital ratios fall close to the regulatory limit?" They estimate a simple model in which banks have an optimal or target level of capital in mind, and adjust slowly to this target. Their conclusion is that banks approaching the limits imposed by regulators raise capital but do not shed loans.

Aggarwal and Jacques (1997) attempt to measure the impact of Prompt Corrective Action[1] (PCA) on US bank capital levels and bank risks. They used data on bank balances for the years 1991, 1992, and 1993 to allow assessment of banks' behavior before and after the introduction of PCA in 1992. They find that banks with low levels of capital at the beginning of the period increased their levels of capital by the end and reduced the riskiness of their asset portfolios.

Bertrand (2000) uses a simultaneous equations model to analyze adjustments in capital and risk in Swiss banks as they approach the minimum regulatory capital level. The results indicate that regulatory pressure induces banks to increase their capital but does not affect the level of risk.

In sum, previous studies find little evidence of banks increasing their risk exposure as they approach minimum capital requirements rather the reverse.

3. THE STRUCTURE OF BANKING IN JORDAN

3.1. Background

The history of banking in Jordan goes back to 1925, when the Ottoman Bank, Standard Chartered Bank started operating in the country. Thereafter, local and foreign banks were established, bringing the total number to 21 by the end of 2002.

The banking industry in Jordan has passed through three stages. In the first stage (1925–1970) there was a long period of virtual monopoly overseen by the regulatory authorities. The second stage (1970–1990) was one of financial liberalization. The third stage (1990–2002) has been characterized by the increased expectations of clients, who want the banks to provide them with new and sophisticated services and by the impact of implementing the Basel Accord.

Nine of the 21 banks operating in 2002 were commercial banks and five were investment banks. In addition, there were two Islamic banks and five branches of foreign banks. The number of operating branches of the banks in 2002 was 463. Commercial banks dominate the Jordanian financial system.

3.2. Prudential Regulations

The prudential regulation of banks in Jordan is carried out by a mix of offsite inspections, moral suasion, and the issuance of directives. All the commercial banks in Jordan are required to supply monthly statements and are subject to physical examination by the Central Bank of Jordan's (CBJ's) examiners at least once a year.

3.3. Capital Adequacy Regulation in Jordan

Capital adequacy regulation in Jordan was first addressed in 1973 through the issuance of the Board of Directors Decision number 55. A capital/assets ratio was imposed at the level of 7% (10% if the bank's capital was less than JD 2.00 millions) and was increased in 1982 to 7.5%. In 1985, the CBJ decided that every bank should increase its capital to a minimum of JD 5.0 millions, as a rule of thumb (if the 7.5% ratio is less than that amount). In the light of this rule, the capital/assets ratio applied to banks was retained at 7.5% until 1992. Some foreign banks could not raise their capital due to economies of scale considerations and thus decided to close their offices. In 1997, the CBJ mandated banks to raise their capital to JD 20.0 millions Recently, the CBJ has issued new regulations for banks to increase their capital to JD 50.0 millions by the end of 2006 (see Table 1). Some banks have already raised their capital to match these new requirements. But the rest are still working on the new regulations either by raising their capital or merging with other banks.

The CBJ has used a mix of regulatory forms and styles, supported by the power of law, to encourage banks to strengthen their capital base. In compliance with the 1971 Banking Law, the undercapitalized banks were prohibited from distributing dividends before reaching the minimum level of adequate capital. Well-capitalized banks, on the other hand, are required to provide 10% of their annual profits to support supplementary capital; as long as the latter is less than the core capital.

To avoid penalties, commercial banks have responded positively and have increased their capital ratios. The CBJ is regarded to be conservative in its

Table 1. Capital Data for Different Categories of Jordanian Banks (Average 1980–2002).

Categories	Average Capital Ratio (1980–2001) in (%)	Standard Deviation of Excess Capital
Domestic commercial banks	16.71	4.137244
Domestic investment banks	16	4.012
Foreign banks	11.85	4.344871
All banks	14.23	4.541712

approach to developments in the banking sector. It tightly controls the opening of branches and views mergers and the consolidation of the banking sector favorably as the banking market in Jordan is small and the competition intense. Lending opportunities are scarcer than in other countries of the region and the CBJ is keen to encourage consolidation through the provision of appropriate incentives. The CBJ carefully reviews the adequacy of provisioning against bad and doubtful debts, requires monthly banking returns, and publishes a detailed monthly statistical analysis. The regular checks undertaken by the CBJ focus particularly on liquidity, credit or asset quality, and capital adequacy.

The CBJ's statistical bulletins show that aggregate capital plus reserves of the commercial banks increased by 25% on average during the period 1977–1986. In aggregate, commercial banks' capital/assets ratios during the past 10 years were 9.1%, whereas the legal ratio imposed by BIS was only 7.5%. Hence, in aggregate, banks held excess capital.

Jordan was among the countries that committed to the Basel Accord, and thus the CBJ issued a directive to the commercial banks requiring them to comply with the new rules from 1992. To make the R-RCARS more compatible with the Jordanian market, the CBJ included some minor adjustments to the rules. It raised banks' minimum capital to JD 20 millions in 1997, and issued new regulations for banks to increase their minimum capital to JD 50 millions by the end of 2006.

4. EMPIRICAL MODEL

4.1. The Model

In this paper, a simultaneous model with a partial adjustment framework for capital and risk is used to assess how Jordanian banks react to requirements placed by the regulator on their capital. It builds on the work on US banks by Shrieves and Dahl (1992) and in its extensions (Aggarwal & Jacques, 1998; Ediz et al., 1998; Jacques & Nigro, 1997); and also on Bertrand (2000), discussed above.

To investigate the impact of bank capital requirements, annual panel data on a number of Jordanian banks that existed between 1980 and 2002 are used for the empirical analysis.

An important aspect of this methodology is that it recognizes that changes in both capital and risk have an exogenous as well as an endogenous character. The present study differs from other studies of Jordanian banks in three main areas. First, bank capital and risk behavior is modeled explicitly. Second, it takes account of the regulatory pressure implied by the minimum capital requirements. Finally, it examines a smaller number of banks, namely those that were in existence throughout the estimation period. It should be stressed that the Jordanian banking market has not reached a high level of development and hence sophisticated financial instruments are not widely available.

To allow for the possibility that capital ratio and risk decisions are determined simultaneously, the analysis of Jordanian banks' capital behavior is based on the simultaneous equations model developed by Shrieves and Dahl (1992). In that model, observed changes in banks' capital and risk levels consist of two components, a discretionary adjustment and a change caused by factors exogenous to the bank. Hence,

$$\Delta CAP_{j,t} = \Delta^{d} CAP_{j,t} + E_{j,t} \tag{1}$$

$$\Delta RISK_{j,t} = \Delta^{d} RISK_{j,t} + S_{j,t} \tag{2}$$

where $\Delta CAP_{j,t}$ and $\Delta RISK_{j,t}$ are the observed changes in capital and risk levels, respectively, for bank j in period t.

The discretionary changes in capital and risk $\Delta^{d} CAP_{j,t}$ and $\Delta^{d} RISK_{j,t}$ are modeled using the partial adjustment framework, thereby recognizing that banks may not be able to adjust their desired capital ratio and risk levels instantaneously, and $E_{j,t}$ and $S_{j,t}$ are exogenously determined factors. In this framework, the discretionary changes in capital and risk are proportional to the difference between the target levels and the levels existing in period t–1:

$$\Delta^{d} CAP_{j,t} = \alpha(CAP^{*}_{j,t} - CAP_{j,t-1}) \tag{3}$$

$$\Delta^{d} RISK_{j,t} = \beta(RISK^{*}_{j,t} - RISK_{j,t-1}) \tag{4}$$

where $CAP^{*}_{j,t}$ and $RISK^{*}_{j,t}$ are bank j's target capital and risk levels, respectively, and $0<\alpha$, $\beta<1$.

Substituting Eqs. (3) and (4) into Eqs. (1) and (2), the observed changes in capital and risk can be written as

$$\Delta CAP_{j,t} = \alpha(CAP^{*}_{j,t} - CAP_{j,t-1}) + E_{j,t} \tag{5}$$

$$\Delta RISK_{j,t} = \beta(RISK^{*}_{j,t} - RISK_{j,t-1}) + S_{j,t} \tag{6}$$

5. EMPIRICAL PROCEDURE AND DATA

5.1. Definitions of Capital and Risk

Two alternative definitions of banks' capital are used: the ratio of total capital (Tier 1 + Tier 2) to risk-weighted assets (RCRWA) and the ratio of capital to total assets (RCTA). Shrieves and Dahl (1992) used the RCRWA definition, which has become more widely used since the introduction of R-RCARS and has been used by Jacques and Nigro (1997), Aggarwal and Jacques (1998), and Ediz et al. (1998).

The measurement and definition of banks' risk is quite problematic and the literature suggests a number of alternatives, all of which are subject to some criticism. In this study, we opt for the ratio of RWA to total assets (RWATA) as proposed by Shrieves and Dahl (1992) and used subsequently by Jacques and Nigro (1997) and Aggarwal and Jacques (1998). The rationale for using this measure is that portfolio risk is primarily determined by the allocation of assets across the different risk categories.

5.2. Variables Affecting Changes in Banks' Capital and Risk

In Eqs. (5) and (6), changes in capital and risk in period t are a function of the target capital and risk levels, the lagged capital and risk levels, and any exogenous factors or shocks. Next, possible explanatory variables for $\Delta CAP_{j,t}$ and $\Delta RISK_{j,t}$ are introduced and their expected impact on banks' capital and risk is discussed. All these variables have been used by Shrieves and Dahl (1992), with the exception of the current profits variable, emphasized by Aggarwal and Jacques (1998).

The first variable, bank size, may influence target risk and capital levels due to its relationship with risk diversification, investment opportunities, and access to equity capital. The natural log of total assets (SIZE) is included in the capital and in the risk equations to capture size effects. SIZE is expected to be inversely related to changes in capital and risk.

The second variable, current profits, which is measured here as return on assets (ROA), may affect banks' capital if financial institutions prefer to increase capital through retained earnings, rather than through equity issues, which may convey negative information to the market about the bank's value in the presence of asymmetric information. ROA is included in the change of capital equation and a negative coefficient is expected.

The third variable, the bank's current loan losses, affect the ratio of RWA to total assets as they lead to a decrease in the nominal amount of the

RWA. These losses (LLOSS) are approximated by the ratio of new provisions to total assets and therefore included in the risk equation with an expected negative effect on the change in RISK.

The fourth variable, regulatory pressure, according to the buffer theory propounded by Calem and Rob (1996), predicts that a bank approaching the regulatory minimum capital ratio may have an incentive to boost capital and reduce risk to avoid the regulatory costs triggered by a breach of the capital requirements. However, poorly capitalized banks may be tempted to take more risk in the hope that higher expected returns will help them to increase their capital (''gambling for resurrection''). Specifically, regulatory pressure can be evaluated in several ways. Ediz et al. (1998) adopt a relatively refined approach that reflects the impact of the capital ratio's volatility on the probability of failing to meet the legal requirements. It was used by Aggarwal and Jacques (1998) and later by Rime (2001). The hypothesis is that the quality of regulatory pressure changes once banks fall below certain regulatory thresholds. In the US, the Federal Deposit Insurance Corporation Improvement Act defines a series of capital thresholds used to determine what supervisory actions would be taken by bank regulators. The PCA zones start even above the regulatory minimum of 8%. It is straightforward to model such an explicit PCA scheme by regulatory dummies corresponding to different PCA zones (Aggarwal & Jacques, 1998), measure regulatory pressure in the US using the aforementioned PCA classification between adequately capitalized and undercapitalized institutions.

In line with the probabilistic approach, the regulatory pressure variable (REG) used here is unity for bank with risk capital weighted assets over 12% and 0 otherwise. REG is expected to affect the change in risk equation positively but is expected to have no significant effect on the capital equation. Inserting these variables into Eqs. (5) and (6) yields the following:

$$\Delta CAP_{j,t} = a_0 + a_1.REG_{j,t-1} + a_2.ROA_{j,t} + a_3.SIZE_{j,t} + a_4.\Delta RISK_{j,t} + a_5.CAP_{j,t-1} + a_6.NIT_{j,t} + \mathrm{a}_7.FNT_{j,t} + E_{j,t} \tag{7}$$

$$\Delta RISK_{j,t} = a_0 + a_1.REG_{j,t-1} + a_2 LLOSS_{j,t} + a_3.SIZE_{j,t} + a_4.\Delta CAP_{j,t} + a_5.RISK_{j,t-1} + a_6.NIT_{j,t} + a_7.FNT_{j,t} + S_{j,t} \tag{8}$$

5.3. Data and Estimation

The annual panel data used in this study was derived from banks' balance sheets and income statements provided by the CBJ. The sample consists of

12 of the 21 banks operating on Jordan over the observation period (1980–2002). These 12 banks were established before 1980, while the remaining nine were established in the 1990s. In particular, the two questions in which we are interested are (1) Does pressure from supervisors affect bank capital when capital ratios approach their regulatory minimum? (2) Which items of their balance sheets are adjusted when banks are subject to regulatory pressure?

Following Jacques and Nigro (1997) and Aggarwal and Jacques (1998), the equations defined by (7) and (8) are estimated using the three-stage least-squares procedure, which allows us to take into account the simultaneity of banks' adjustments in capital and risk and to get estimates that are asymptotically more efficient than two-stage least squares. The cross-sectional data are pooled, as in Shrieves and Dahl (1992), over the 22-year reference period. Two definitions of banks' capital are used: the ratio of capital to total assets (RCTA) and the ratio of capital to risk-weighted assets (RCRWA).

The use of time-series cross-section data makes it possible to examine issues that could not be studied in either time-series or cross-section alone. Using panel data (Baltagi, 1995) has many benefits. Most important for this study is the potential to control for heterogeneity among Jordanian banks.

6. ESTIMATION AND TESTING RESULTS

6.1. Unit Root Testing

It is necessary to check whether a series is stationary or not before using it in a regression. The two unit root tests can be measured by using one of the following three tests: the Dickey–Fuller (DF) test, the augmented Dickey–Fuller (ADF) test, or the Phillips–Perron (PP) test. We applied the DF and ADF tests. The results are reported in Table 2. These results clearly show that all the series are integrated of order 1, that is, I(1), except SIZE, which is I(2); hence, the series have to be differenced once to become stationary, except SIZE, which is differenced twice to become stationary.

6.2. Results for the System Based on the Ratio of Capital to Risk Weighted Assets (RCRWA) Using Three-Stage Least Squares

Table 3 presents the results for Eqs. (7) and (8) when CAP is measured by RCRWA. The independent variable (SIZE) has a negative coefficient

Table 2. Unit Root Test Results.

	Level	*D*(1)	*D*(2)
CAP	−2.33511	−4.569064**	
ΔCAP	−3.290542*		
ΔRISK	−10.14784*		
LLOSS	−2.281426	−3.423384*	
REG	−2.163077	−8.431346**	
RISK	−2.252167	−6.08866**	
ROA	−2.743137	−5.104977**	
SIZE	−1.628255	−2.586431	−7.453119**

Note: The critical values are based on the simple Dickey–Fuller and augmented Dickey–Fuller unit root tests. *D*(1) defines the first difference and *D*(2) the second difference.

Table 3. 3SLS Estimation and Testing Results based on the Ratio of Capital to Risk Weighted Assets.

Variable	ΔCap			ΔRisk		
	Coefficient	*t*-Statistic	Probability	Coefficient	*t*-Statistic	Probability
C	3.5901	4.3167	0.0001	26.2815	5.0454	0.0001
CAP(−1)	−0.1899	−5.141	0.0001	–	–	–
REG(−1)	0.3665	1.0757	0.2831	4.133	2.6178	0.0094
ROA	−0.1338	−1.0841	0.2793	–	–	–
ΔRISK	−0.0667	−11.613	0.0001	–	–	–
SIZE	−0.0232	−0.2915	0.7709	−0.3882	−0.6316	0.5282
Risk(−1)	–	–	–	−0.2898	−7.5889	0.0001
LLOSS	–	–	–	−1.3596	−2.9868	0.0031
Δcap	–	–	–	−1.7717	−5.618	0.0001
DW	1.494055		–	DW	2.009516	–
R-squared (adjusted)	0.19053			*R*-squared (adjusted)	0.227734	

($a_3 = -0.023$), which is insignificant ($t = -0.23$) in the capital equation (7) relationship, indicating that large banks do not have to increase their RCRWA less than small banks. This could imply that all the Jordanian banks maintain the mandated capital ratio.

The independent variable ROA is used to represent bank profitability and current earnings. When estimated in the system based on the RCRWA in the capital equation, ROA has a negative ($a_2 = -0.13$) and insignificant coefficient ($t = -1.08$). This indicates that profitable banks do not raise their capitalization through retained earnings. Thus, profitability does not affect the changes in capital ratios and banks may elect to shift their portfolios toward riskier assets. In addition, the results show that there is a significant and positive relationship between change in capital lagged and change in risk. This also indicates that banks opt to increase their portfolio risk to maintain the requested capital ratio. The regulatory pressure variable (REG) has no significant impact in the capital equation, where $t = 1.08$ and $a_2 = 0.37$, when applying the RCRWA. In the risk equation, the regulatory pressure variable has a significant impact ($t = 2.62$) on banks' risk ($a_2 = 4.13$), which indicates that banks approach the minimum capital requirements by increasing the risk in their portfolios. In the RISK equation (8), the variable SIZE has a negative ($a_3 = -0.39$) and an insignificant ($t = -0.63$) coefficient, reflecting big banks' engagement in low-risk mortgage lending. The variable LLOSS has a significant ($t = -2.99$) and negative effect ($a_3 = -1.36$) in RISK equation (8), as expected. In both equations, a significant and negative relationship emerges between changes in capital and changes in risk.

6.3. Results for the System Based on the Ratio of Capital to Total Assets (RCTA)

Table 4 presents the results for Eqs. (7) and (8) when CAP is measured as RCTA. The independent variable (SIZE) has a positive ($a_6 = 0.05$) and insignificant ($t = 1.10$) relationship on the capital equations (7). ROA has

Table 4. 3SLS Estimation and Testing Results based on the Ratio of Capital to Total Assets.

Variable	ΔCap			ΔRisk		
	Coefficient	*t*-Statistic	Probability	Coefficient	*t*-Statistic	Probability
C	0.6442	1.6981	0.0907	29.2245	5.0369	0.0000
TCAP(−1)	−0.1224	−3.8378	0.0002	–	–	–
REG(−1)	0.0433	0.3212	0.7483	7.9013	5.6374	0.0000
ROA	0.0339	0.6771	0.4989	–	–	–
ΔRISK	0.0127	4.8177	0.0000	–	–	–
SIZE	0.0447	1.0960	0.2741	−0.8938	−1.6246	0.1055
Risk(−1)	–	–	–	−0.4015	−10.0075	0.0000
LLOSS	–	–	–	−2.6717	−6.3167	0.0000
ΔTCAP	–	–	–	2.7957	5.4675	0.0000
DW	1.818883			DW	1.859038	
R-squared (adjusted)	0.03502			*R*-squared (adjusted)	0.168863	

an insignificant ($t = 0.68$) and positive ($a_4 = 0.03$) impact on banks' risk taking when applying the system based on the ratio of capital to total assets in Eq. (7) and the regulatory pressure variable (REG) has an insignificant ($t = 0.32$) but positive ($a_3 = 0.04$) effect in Eq. (7). In contrast, in the RISK equation (8), the REG has a significant ($t = 5.64$) and positive impact ($a_2 = 7.90$), which indicates that banks approaching the minimum capital requirements increased the share of risk in their portfolios. LLOSS has a significant ($t = -6.32$) and negative effect ($a_7 = -2.67$) and SIZE has a negative and insignificant ($a_6 = -0.40$, $t = -1.63$) relationship in the RISK equation (8). SIZE is the only independent variable that has an insignificant coefficient in the change in risk equation. The DW test provides no evidence of autocorrelation in either equation.

Overall, the results may reflect Jordanian banks' difficulties in adjusting their capital in a relatively illiquid market. The absence of the relationship between the regulatory pressure variable (REG) and changes in capital (however measured) indicates that Jordanian banks approaching the minimum legal requirements tend to maintain and improve their capital adequacy to avoid the penalties implied by a breach of the guidelines. The positive and significant impact on changes in risk of changes in capital (as measured by RCRWA) indicates that the Jordanian banks improve their capital adequacy by increasing their capital (retained earnings, equity issues), and not by decreasing their risk taking. Indeed, there is some indication of an increase in risk taking. The observation of a significant and positive relationship between the changes in risk (ΔRISK) and changes in capital (ΔCAP) is compatible with the intuition that in a regime of risk-weighted capital requirement, banks bounded by the capital standards have to adjust RWA and their capital ratio (RCRWA) in the same direction to continuously meet or beat minimum requirements.

7. CONCLUSIONS

In this study, the capital and risk behavior of Jordan's banking sector during the period 1980–2002 has been examined. Jordanian banks' capital is normally close to the minimum regulatory capital requirements. It is found that regulatory pressure has no significant impact on the ratio of capital to total assets, which indicates that Jordanian banks approaching the minimum requirements tend to improve their capital adequacy to avoid the penalties incurred following a breach of the guidelines. However, regulatory pressure has a positive and significant impact on the changes in risk, which indicates that Jordanian banks tend to adjust their RWA to keep their RCRWA from falling below the minimum. A significant relationship emerges between changes in risk and changes in both the ratio of capital to total assets and the ratio of capital to RWA. These findings imply that Jordanian banks constrained by the capital adequacy requirements increase both capital and risk to keep their risk-adjusted capital ratio from falling below the minimum while maintaining their profitability.

The bank regulators in Jordan focus on banks' capital and impose strict conditions to ensure its adequacy at all times. The CBJ has been successful in prompting banks into increasing their capital ratios. The Jordanian market has not yet reached a high level of development and thus risk-mitigation tools (derivatives, etc.) are not widely used. Furthermore, the Jordanian economy is highly volatile and vulnerable to external stocks. Events that take place abroad, especially in the Middle East region, affect both the domestic economy and the financial system. The relationships between banks' capital, risk, and ROA revealed in this paper may thus change over time as stability in the region (hopefully) increases, and as the banking and wider financial markets deepen.

NOTE

1. Prompt Corrective Action is a clause enabling US supervisory authorities to take administrative action, including issuing decisive orders for improvement of management, based on objective criteria like capital adequacy ratios.

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APPENDIX

Classification of Assets and Risks Held by Jordanian Banks

(1) Nil weight

Loans to the government sector in local currency. Government securities in local currency.

Government and public economic authorities' rediscounted and exchange bills in local currency.

Letter of credit to the government and public economic authorities in local currency.

Letters of guarantee to the government and public economic authorities.

Contingent liabilities on guarantees for loans to the government and public economic authorities.

(2) 0.2 weight

Loans to public economic authorities in local currency.

Loans to (or guaranteed by) government to OECD countries.

Balances with international development banks.

Balances with banks of the OECD countries.

Balances with banks of other countries with a maximum term of up to one year.

Export credit to banks of OECD countries.

Export credit to bank of other countries with a maximum term of up to one year.

(3) 0.5 weight

Loans with a real state guarantee.

(4) 1.0 weight

Loans to the government sector in foreign currency.

Government securities in foreign currency.

Loans to the public economic authorities in foreign currency.

Loans to the public sector companies.

Loans to the private sector.
Loans to non-bank financial intermediaries.
Loans to foreign sector, other than those guaranteed by OECD.
Private sector and foreign securities.
Balance with banks overseas with a term more than one year.
Government and public economic authorities' rediscounted and exchange bills in foreign currencies.
Other sectors' rediscounted and exchange bills in foreign currency.
Letters of credit to the government or the public economic authorities in foreign currency.
Letters of credit to other sectors.
Export credit to bank overseas, other than banks of OECD countries with term of more than one year.
Letter of guarantee to the government and public economic authorities in foreign currency.
Letters of guarantee to other sectors.
Contingent liabilities on guarantees for loans to the government and public economic authorities in foreign currency.
Contingent liabilities on guarantees for loans to other sectors.

Source: Central Bank of Jordan.

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REGULATORY INTERVENTION AND RESOLUTION OF FAILED BANKS IN UGANDA

Martin Brownbridge

ABSTRACT

Bank regulators face difficult decisions when dealing with distressed banks. This paper examines the problems faced by the bank regulator in Uganda in tackling bank distress in 1998 and 1999, when four private sector banks and a large partly government-owned bank failed, and the intervention and resolution policies which were implemented to deal with these problems. Key decisions faced by the regulator included whether to attempt some form of open bank resolution, whether to place distressed banks under statutory management and how best to secure a sustainable resolution for a bank considered 'too big to fail'.

1. INTRODUCTION

Bank failures have been common in developing countries (DCs) in the last two decades, as a result of poor bank management, fraud or abuse on the part of bank owners and managers and/or because of economic shocks which impair the value of bank assets.[1] Bank failures have often proved

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costly for taxpayers, especially where regulatory forbearance was extended to distressed banks (Honohan & Klingebiel, 2000). Effective and timely regulatory intervention and bank resolution policies are critical to minimising the fiscal cost of bank failures and their potential to inflict wider damage on the economy, as well as for preserving incentives for prudent bank management in the banking system.[2]

In 1998 and 1999, the Ugandan banking system suffered several bank failures, with five banks subjected to regulatory intervention by the bank regulator, the Bank of Uganda (BOU). One of these failures was a large bank, with majority government ownership, while the other four were smaller and owned by the private sector. There were important differences between these banks in terms of their importance to the banking system and their franchise value, which warranted different intervention and resolution strategies on the part of the regulator.

This paper outlines the intervention and resolution policies implemented by the BOU and analyses the lessons which can be learned from this experience. It is organised as follows. Section 2 discusses some of the key issues which should guide regulatory intervention in distressed banks and the constraints which impede timely and appropriate regulatory intervention. Section 3 examines the intervention and resolution policies which were pursued in respect of the four private sector banks, while Section 4 examines how the large partly government-owned bank was resolved. Section 5 gives a conclusion.

2. ISSUES WHICH DETERMINE BANK INTERVENTION POLICIES

Before proceeding, it is useful to clarify the terms used in the paper. A *distressed bank* is one which is insolvent or severely undercapitalised and/or is chronically illiquid. *Regulatory intervention* is defined as the taking over of a distressed bank by the bank regulator.[3] A *failed bank* is one which is suffering distress and is subject to regulatory intervention. *Bank resolution* is the process through which a failed bank is either restored to financial soundness or exits the banking system. Resolution methods include closure and liquidation, recapitalisation, sale to new owners or merger with a sound bank.[4] *Open bank resolution* refers to a resolution which is implemented while the bank remains open for business. Regulatory intervention usually takes place after other, less drastic, regulatory measures, have been taken by the regulator but which have failed to halt the worsening of the bank's financial condition. These measures could include cease and desist orders and the signing of agreements by the distressed bank's owners to recapitalise their bank and strengthen its management.

The objectives and modalities of regulatory intervention depend crucially on whether the bank regulators are facing a systemic banking crisis or a non-systemic episode of bank failure. Therefore, a key judgement which regulators must make, on the basis of the information that is available to them, is what type of crisis they face.

A systemic banking crisis involves widespread illiquidity and insolvency in the banking system, with a loss or potential loss of public confidence in the safety of deposits, leading to deposit runs on many banks. In a systemic crisis, individual bank failures have contagion effects, even on those banks which may be financially sound, because of the nature of the deposit contract and the difficulty which depositors face in determining whether their bank is still solvent, and hence whether it will be able to honour all its liabilities to depositors (Diamond & Dybvig, 1983). Because of illiquidity and/or widespread bank insolvencies, a systemic crisis can jeopardise the overall viability of the banking system, which in turn would have serious negative externalities for the economy caused by damage to the payments system and to credit relationships between banks and non-banking commercial enterprises.

The primary objective of the bank regulator in dealing with a systemic banking crisis is to preserve the viability of the banking system and minimise negative externalities. In these circumstances, public financial support to banks may be warranted, although this is not inevitable. Therefore, the bank regulator cannot resolve a systemic crisis on its own, but must do so in cooperation with the government and especially the fiscal authorities who will eventually have to bear the cost of any public support extended to banks. It is possible that some form of government guarantee, beyond that which is provided for under a deposit insurance scheme, might be needed to prevent panic-driven deposit withdrawals from the banking system, alongside liquidity support from the Central Bank. It may also be necessary for the government to support the recapitalisation of banks. However, in order both to minimise the fiscal costs of crisis resolution and to limit the moral hazard which arises from bailing out failed banks, it is essential that any financial support which is provided by the government should be restricted to banks which have some franchise value, are potentially commercially viable, and have in place, or can put in place, competent management, and ideally should complement new capital investment from the private sector. Hence, it is critical for the regulator to evaluate which banks are viable in the long term and which are not, with the latter being closed down quickly to halt further losses and to avoid weakening incentives for sound management among the remaining banks (Frydl & Quintyn, 2000).

Non-systemic bank failures are those which do not have contagion effects on sound banks and do not threaten the overall stability of the banking system. The objectives of the regulator in dealing with non-systemic bank distress should be to prevent, as far as possible, any losses to the deposits of the distressed bank(s) without having to resort to public subsidies and to maintain incentives for prudent management in the banking system, by ensuring that the losses incurred by failed banks are borne by their owners. Because there is no threat to the wider banking system and no public subsidy is needed, the bank regulator should be able to tackle non-systemic bank distress as an issue of bank regulation alone, without having to take into consideration other objectives, although for legal and political reasons consultation with the government may be necessary.

The case of distressed banks which are large and government owned (or partly government owned) falls somewhere in between the two categories of systemic and non-systemic failures. Financial distress in these banks is often the result of political pressure to fulfil non-commercial objectives (Basle Committee on Banking Supervision, 2002, p. 40). These banks are often regarded as 'too big to fail' in some DCs because they are the only banks in these countries with nationwide branch networks, and provide the only banking services outside of the main towns and cities. As such, they play a crucial role in the economy's payments system and cannot simply be closed down if they are insolvent without adverse effects on the economy. Resolving these banks often requires a combination of recapitalisation, restructuring to reduce operating costs and the introduction of reputable private sector capital and management. However, they are less likely than private sector banks to lose the confidence of their depositors and suffer a run on their deposits, because government ownership provides an implicit government deposit guarantee, over and above any guarantee on deposits conferred by a deposit insurance scheme.

Timely regulatory intervention in a distressed bank is usually essential to prevent its losses from mounting to the point where the bank becomes insolvent and where depositors (or the deposit insurance scheme if one exists) suffer losses. As a bank's capital erodes, its owners have fewer incentives left to maintain prudent management policies and instead have incentives to "gamble for resurrection" in the hope that by taking greater risks with depositors' funds (for example, by investing in assets which are riskier but potentially yield higher returns) their investment in the bank can be recovered. Owners and/or managers may even have incentives to loot their bank's assets if they believe they can get away with it (Akerlof & Romer, 1993). Consequently as a distressed bank's capital erodes and it approaches insolvency, its losses may begin to escalate rapidly, unless bank regulators either force the bank's owners and management to take remedial actions which can halt the losses or intervene and take control of the bank themselves.

A frequent constraint to timely regulatory intervention is uncertainty over the precise financial condition of a distressed bank. The main indicator of a bank's financial condition is the level of its regulatory capital as defined in the Basle Capital Accord, but the measurement of capital depends on the accuracy by which a bank's assets and liabilities are disclosed, measured and recorded. In many countries, distressed banks have reported adequate levels of capital in their annual financial statements and the returns submitted to regulators even though they were actually insolvent because of the impaired quality of their assets. Accounting policies towards the valuation of assets, provisioning for impaired assets and the accrual of income have a profound impact on measured capital. The share of non-performing loans in distressed banks' loan portfolios is usually large, as this is the main cause of bank distress, but in many cases banks have not recognised these assets as being impaired and made adequate provisions against probable losses. In some cases, this was because the provisioning policies stipulated by the bank regulators were themselves not very strict, a weakness which is being rectified in some countries where provisioning policies are being upgraded and brought into line with international standards, but there were also instances where banks failed to comply with the required provisioning rules and did not disclose the full extent of the impairment of their assets to either their external auditors or the bank regulators. Two of the failed private sector banks in Uganda incurred large losses arising from assets and liabilities which were not held on their balance sheets and were not disclosed to either their external auditors or the bank regulators.

In many low-income DCs, the problems of accurately determining banks' financial condition are compounded because there are only a limited number of accounting firms with the expertise to audit banks. For the smaller banks, employing a high-quality accounting firm as external auditor may be prohibitively expensive.

Banks often claim that collateral protects the value of non-performing loans, and hence obviates the need for loan loss provisions to be made. International Accounting Standards recognise that the fair value of collateral, if foreclosure is probable, should be taken into account when valuing an impaired loan. But both foreclosing on loan security and realising its book value are often very problematic. Accurately valuing assets used for security, such as land, is difficult if there are not well-functioning markets in these assets which can be used for price disclosure. Valuations carried out by professional valuers are not always reliable. Asset prices may also be highly volatile and be subject to booms and busts, so that assets used to secure loans made during lending booms may collapse in value if there is a subsequent slump. Legal title to assets may be unclear and disputed because, for example, systems of property registration are weak and vulnerable to corruption. Because of weaknesses in the procedures for contract enforcement and in the operations of commercial courts, it may be difficult and time-consuming for banks to foreclose on defaulters in the courts and realise the assets pledged as security. In some cases, the same collateral is pledged as security to multiple lenders. The financial costs incurred by the lender in foreclosing on the security, such as legal fees, must also be offset against the value of the security which is eventually realised (Song, 2002).

Therefore, because the impairment of assets may not be fully disclosed, or because adequate loan loss provisions are not made for non-performing loans, the scale of losses in a distressed bank is likely to be underestimated in the bank's own financial statements. Sheng (1996) points out that when failed banks are finally liquidated, the losses usually turn out to be much higher than those estimated by the bank regulator, which in turn are a multiple of the losses reported by the bank's managers. Because of uncertainty over the financial condition of distressed banks, the regulators have sometimes commissioned special audits by external auditors, which are more comprehensive in scope than banks' normal external audits, but this is both time-consuming and expensive. Moreover, the special audit will not necessarily produce an accurate assessment of the distressed bank if the bank's managers conceal relevant information from the auditors, as was the case with two of the failed banks in Uganda.

Effective regulatory intervention also depends on the regulators having sufficient legal authority to intervene in, and assume control of, a distressed bank and to implement a least cost bank resolution. The regulators must have the legal authority to pursue a range of resolution options without necessarily having the agreement of the distressed bank's owners, including selling the bank or its assets and liabilities, writing down the value of shareholders' equity and liquidation. The resolution of the bank failures in Uganda was facilitated by the Financial Institutions Statute, 1993,[5] which gave the BOU authority to take over a bank whose deposits were at risk and to close it. The statute also gave the BOU the authority to act as receiver of an intervened bank and to reorganise it, arrange to sell it or merge it with another bank or liquidate it.

3. INTERVENTION IN DISTRESSED BANKS IN UGANDA

During 1998 and 1999, five distressed banks, all of which were insolvent, were intervened by the BOU. The distressed banks' insolvency was primarily caused by very heavy loan losses.[6] Table 1 gives details of the five failed banks, their ownership, level of total assets and insolvency and method of regulatory intervention and resolution. Uganda Commercial Bank Ltd (UCBL) held almost a quarter of the banking system's assets and deposits, whereas the four private sector banks together held 15% of banking system's assets and 12% of its deposits. UCBL was regarded by the bank regulator and government as 'too big to fail', and its closure was never considered as an option, because it owned almost half of all the banking system's branches, including the only branch in many locations in the country, and hence was integral to the payments system. The intervention and resolution of UCBL are described in the next section, while this section examines how the BOU intervened in the four smaller private sector banks.[7]

As discussed in Section 2, a crucial judgement for the regulator to make is whether individual incidents of bank distress reflect the emergence of a potential systemic crisis. The financial returns available to the regulators did not indicate that financial distress was widespread in the banking system. Although some other small banks were undercapitalised and illiquid, 65% of the banking system's deposits were held by banks which were adequately capitalised and liquid. There was some concern that the closure of Greenland Bank and the Cooperative Bank would undermine depositor confidence in other banks, but these concerns proved unfounded. Only one small deposit taking non-bank financial institution suffered a serious but temporary run on its deposits. Total deposit growth in the banking system amounted to 30% in real terms over the 2 years from June 1998 to June 2000, the period during which all the bank closures occurred. Therefore, the failures of the four private sector banks did not constitute a systemic banking crisis.

In dealing with non-systemic incidents of bank distress, bank regulators must decide whether to attempt some form of open bank resolution or to close the bank. The former involves allowing the distressed bank to remain open for business while efforts are made to rehabilitate it. If the regulators

Table 1. Regulatory Intervention and Resolution of Failed Banks in Uganda: 1998–1999.

Bank and Ownership	Total Assets Shs billion (percent of banking system in parenthesis)	Estimated Insolvency Shs billions	Method of Intervention	Method of Resolution
Uganda Commercial Bank (government 51%, private 49%)	330.7 (22.7)	15.5	Open resolution under existing management, followed by intervention and statutory management for 2 years and 10 months	Sale on "as is" basis to an international bank
Greenland Bank (private)	105.6 (7.3%)	82.3	Open resolution under existing management followed by intervention and statutory management for 4 months, followed by closure	Liquidation
International Credit Bank (private)	30.9 (2.1%)	49.3	Intervention and closure	Liquidation
Cooperative Bank (private, owned by cooperative societies)	74.3 (5.1%)	28.1	Open resolution under existing management, followed by intervention and closure	P & A and liquidation
Trust Bank (private)	11.9 (0.8%)	1.0	Open resolution under existing management followed by intervention and closure	P & A and liquidation

Notes: The average exchange rate in 1998–1999 was Shs 1,363/$
P & A, purchase of assets and assumption of liabilities.
Source: Bank of Uganda (2002).

attempt open bank resolution, they must also decide whether to allow the existing owners to retain control of the bank's management or to intervene and take over the bank, placing it under the statutory management of the bank regulator. Both courses of action entail potential difficulties. Whereas International Credit Bank (ICB) was intervened and closed immediately in September 1998, after a special audit had revealed that it was heavily insolvent, the other three private sector banks all underwent a period of open bank resolution in the hope that they could be rehabilitated through a combination of recapitalisation, loan recovery and improvement in management. Open bank resolution for Greenland Bank began under its existing management, but when it became known to the regulator that its financial condition was much worse than had been previously estimated and that it required substantial liquidity support from the BOU, it was intervened and then placed under statutory management, before it was eventually closed 4 months later. Both the Cooperative Bank and Trust Bank underwent open bank resolution lasting several months under their own management, before the regulator intervened and closed them when it was clear that there was no longer any realistic prospect of successful rehabilitation.

Two important lessons for intervention policy can be drawn from this experience. Firstly, whereas open bank resolution often appears to be an attractive option for the regulator because it avoids a bank closure which may be politically contentious, the prospects for a successful open resolution are likely to be overestimated. It is probable that the actual scale of losses, and hence insolvency, of a distressed bank is larger than that revealed in its financial statements, returns submitted to the regulator and even a special audit, for the reasons discussed in Section 2. Also, the prospects for mobilising new funds to recapitalise an insolvent bank are likely to be slim. Faced with regulatory intervention, the owners of distressed banks often make commitments to the regulators to inject new capital, which are subsequently not realised. This is not surprising, because unless the distressed bank has a strong franchise value which could enable it to generate future profits, there are few incentives for either the existing owners or the new owners to invest money to make good the bank's losses which would otherwise be borne by the bank's creditors or taxpayers. Moreover, recapitalisation is just the starting point for a successful resolution, which also requires generating sustainable profitability. A bank without a strong customer base of creditworthy borrowers and franchise value has poor prospects for successful open bank resolution (Andrews & Josefsson, 2003).

Secondly, open bank resolution under the statutory management of the regulator avoids some of the moral hazard and the attendant risks of further losses from imprudent management which arise if the owners retain management control of the bank, but this is also a problematic strategy for the regulator. As the statutory manager of the distressed bank, the regulator must maintain the confidence of its depositors and other creditors, if the bank is to remain liquid. Large depositors and other creditors not covered by deposit insurance are likely to demand assurances from the statutory manager that their assets are safe, but the statutory manager cannot provide these assurances if the bank is insolvent or, given uncertainty over the value of its assets, close to insolvency. If depositors and other creditors lose confidence in the distressed bank, it will probably need liquidity support to allow it to remain open. Consequently, keeping a distressed bank open under statutory management allows the bank's uninsured creditors to withdraw their money from the bank at the expense of the taxpayers, who will have to bear the cost of the liquidity support or of any deposit guarantees extended to the bank. Maintaining the confidence of a failed bank's creditors will be less of a problem for the statutory managers in circumstances where the government has provided a generalised guarantee of bank deposits and/or all liabilities to tackle a systemic banking crisis, or where the distressed bank is government owned and, therefore, carries an implicit government guarantee of its liabilities.

The alternative to open bank resolution is for the regulator to close the failed bank. The advantage of closure is that it avoids the moral hazard involved in open bank resolutions and the need to provide ongoing liquidity support to the failed bank. For a distressed bank with poor prospects for successful rehabilitation, early closure is likely to minimise the extent of the losses borne by depositors and taxpayers. The disadvantage is that closure is likely to be politically more contentious than open bank resolution, but for a bank whose prospects for successful rehabilitation are poor, open bank resolution simply delays the inevitable closure. Consequently, unless there are strong reasons for the regulators to believe that a distressed bank can be successfully rehabilitated, or if the bank is regarded as 'too big to fail', prompt closure is likely to be the optimal method of intervention for the regulator, because this is least costly in terms of moral hazard, losses to depositors and costs to taxpayers.

If the regulators close a bank, there are a variety of possible resolution methods whose feasibility depends on the franchise value, if any, of the closed bank, the extent to which its liabilities are guaranteed by a deposit insurance fund or by government and the priorities of the regulators. Following the closure of Greenland Bank and the Cooperative Bank in April and May 1999, respectively, the government announced that all their deposits would be repaid, including those not covered by deposit insurance.[8] One of the priorities of the regulator in resolving the closed banks was to minimise disruption to depositors.

Of the four banks which were closed by the regulator in Uganda in 1998 and 1999, the Cooperative Bank had significant franchise value because it had a relatively large deposit base and 24 branches, which comprised 18% of the banking system's branches. Therefore, a key objective of the resolution of the Cooperative Bank was to maintain the services to the Cooperative Bank's customers provided through these branches as far as was possible. To do this, the regulator approached several financially strong banks in Uganda and invited them to make bids for packages of the deposits and selected assets of the branches of the Cooperative Bank. Two banks bid for some of these packages, and as a result they acquired a total of 12 branches comprising two thirds of the Cooperative Bank's deposits, together with assets of an equivalent value, through a purchase of assets and assumption of liabilities (P & A) transaction.[9] No bids were made for the Cooperative Bank's loan portfolio because its value was too uncertain. These loans, along with other assets which were not purchased through the P & A, were liquidated. A major benefit of the resolution of the Cooperative Bank was that it led to two financially strong banks expanding their deposit base and opening new branches.

Greenland Bank and ICB had little franchise value and were liquidated. A P & A transaction was also used in the resolution of the Trust Bank, some of whose assets and liabilities were transferred to another bank in Uganda, while the remaining assets were liquidated.

4. INTERVENTION AND RESOLUTION OF UGANDA COMMERCIAL BANK (LTD)

As noted above, UCBL was regarded as 'too big to fail' and hence some form of open bank resolution was necessary. The bank had suffered a series of losses in the 1980s and early 1990s which had left it insolvent. It was recapitalised by the government in 1995[10] and was then partially privatised in 1998, with the sale of 49% of its equity to a Malaysian company, which was also contracted to manage the bank. The privatisation failed within a year, with UCBL rendered insolvent as a result of heavy loan losses, including losses on loans to Greenland Bank and to companies related to Greenland Bank. This failure raised two key questions for the regulator: (1) how should it intervene to stabilise UCBL's financial condition and(2) how could UCBL be resolved in a manner which could achieve the twin objectives of the regulator, to maintain the bank's nationwide branch network and to best ensure the future safety of its deposits. While the safety of deposits is a primary concern of the regulator in dealing with all banks, it becomes an especially important issue if the bank is considered 'too big to fail' because by implication its deposits are protected by government and any losses to deposits caused by bank failure will be borne by taxpayers. In addition, a bank perceived by its creditors as being 'too big to fail' faces reduced market pressure to pursue sound management.

The BOU intervened and placed UCBL in statutory management in April 1999. The objective of the statutory management was to remove the managers who had caused UCBL to suffer losses, and to ensure that the bank was managed in a prudent manner to avoid further losses until a sustainable resolution could be worked out, which given the size of UCBL and its history of poor financial performance, was likely to be a lengthy process. Specifically, the statutory management aimed to preserve the value of UCBL's assets through a conservative investment policy, concentrating on safe assets such as government securities, to recover non-performing loans and control costs. Statutory management by the regulator was less problematic in the case of UCBL than for the private sector banks which failed in this period because, given that UCBL's deposits were already effectively guaranteed by virtue of its government ownership, the need for the statutory manager to reassure its depositors that their deposits were safe, to prevent a run on the bank, did not arise.

Although statutory management by the regulator is intended to be a purely temporary measure until the distressed bank can be resolved in a sustainable manner, the resolution of UCBL was delayed for over 2 years because of uncertainty over legal issues.[11] The extended period of statutory management was successful in returning UCBL to profitability, aided by high interest rates on government securities, so that by December 2000, UCBL had been restored to solvency and met the statutory minimum capital requirements. Once UCBL had regained capital adequacy, there were demands that the statutory management should be lifted, to allow control of the bank to revert to its owners. The regulator resisted this, arguing that a bank which had failed because of mismanagement and had then been restored to solvency through statutory management could not then be returned to the control of the owners who bore responsibility for its failure. Instead, the regulator could only lift the statutory management once a sustainable resolution of UCBL had been secured. Furthermore, it was the responsibility of the regulator to implement a sustainable resolution.[12]

For the regulator, the lesson of the first, failed, privatisation of UCBL was that the quality of ownership is critical for the sound management of a bank. A bank the size of UCBL requires owners with substantial capital and managerial resources and very strong incentives to manage the bank prudently. Incentives for prudent management of a bank are generated by the capital invested by the owners and also by the need to protect a valuable reputation for sound banking. The reputation of the owners matters far more for a bank than for a non-banking enterprise, because a bank is highly geared and can mobilise resources from deposits which are a multiple of its capital. An international reputation for sound bank management is a valuable asset because it enables a bank to mobilise funds more cheaply, by enhancing the confidence of creditors in the safety of the bank. If the owner of a bank has a reputation to protect, it has an additional incentive, over and above that generated by the capital it has invested, to ensure that the bank does not fail with the loss of its deposits. Therefore, the regulator's preference was to sell UCBL to a large international bank with a long established banking reputation.

There were demands that UCBL should be resolved by selling its equity on the local stock exchange, so that the public could own the bank. The disadvantage of selling the equity on the stock exchange is that ownership would be dispersed among a large number of small investors who would not have the capacity or incentives, because of free rider problems, to exercise sufficiently strong control over the bank's management. In addition, while small investors would have their own money at stake in the bank, they would lack the additional incentive of protecting a valuable banking reputation.

To resolve UCBL, the regulator hired consultants to directly market UCBL to international banks which had subsidiaries in DCs and, therefore, could be expected to consider purchasing UCBL. These banks were invited to carry out due diligence on UCBL and then to submit bids either for the entire bank on an 'as is' basis or for packages of its branches. The regulator's preference was to sell the bank on an 'as is' basis because this would keep the branch network intact. To enhance the attractiveness of UCBL to new owners, the regulator made clear in the bid documents that the bank would be able to utilise a deferred tax asset (DTA), which allowed the bank's past losses to be offset against its future income tax liabilities. International Accounting Standards allow such a DTA to be held as an asset on the balance sheet, thereby boosting the bank's capital. As is common in many bank resolutions of this type, the regulator offered bidders a number of warranties under which the buyer of UCBL would be compensated if specified assets of the bank turned out to be worth less than stated in the bank's financial statements or if specified liabilities, such as those arising from legal cases, were larger.

Two banks submitted bids to purchase UCBL on an 'as is' basis. Following negotiations in October 2001, an 80% equity stake in UCBL was sold to a major international bank in early 2002, which then merged UCBL with its existing subsidiary in Uganda later in the year. The resolution process, from the time when the BOU first approached potential bidders to the closure of the sale agreement for UCBL, took approximately 12 months.

5. CONCLUSIONS

The bank failures which took place in Uganda in 1998 and 1999 offer a number of lessons for regulatory intervention and bank resolution policies. Appropriate intervention and resolution policies must be shaped by a number of factors, including whether or not bank failures reflect a systemic banking crisis, whether any of the distressed banks are regarded as 'too big to fail', and the prospects for successfully rehabilitating distressed banks. The distressed UCBL, a large partly government-owned bank, was regarded as 'too big to fail' because of its unique nationwide branch network, and hence the regulator had to implement some form of open bank resolution. The four private sector banks which failed did not threaten a systemic crisis and, therefore, a wider range of options were available to the regulator for intervening in, and resolving, these banks.

In dealing with distressed banks, the regulator is likely to face considerable uncertainty as to the true state of the bank's financial condition, because of the difficulty in accurately ascertaining the probable losses to its assets. It is likely that loan losses are underestimated so that the distressed bank's financial condition is worse than that reported in its financial statements. It is also possible that liabilities or contingent liabilities have not been fully disclosed. Unless the bank has franchise value, it will be difficult to mobilise new capital to make good its losses. Allowing the distressed bank to remain open under the control of its owners risks exacerbating its losses, because the owners have little or none of their capital left to lose and so have few incentives left to exercise prudent management. If the bank is insolvent or close to insolvency, further losses will be borne by its depositors or by taxpayers if depositors are reimbursed by government. The regulator can reduce these risks by placing the distressed bank in statutory management, but this is also problematic because it puts an onus on the regulator to assure the non-insured creditors of the bank that their funds are safe, or to provide liquidity support to the bank. If the bank is subsequently closed, the losses which would have been borne by uninsured creditors will be transferred to the taxpayers.

For distressed banks without good prospects for successful rehabilitation, an open bank resolution strategy will only delay an inevitable closure. Therefore, the optimal regulatory response should be early intervention and closure. In resolving the closed bank, a purchase of assets and assumption of liabilities transaction, under which some of the bank's deposits and assets are transferred to one or more sound banks, offers the opportunity to reduce disruption to depositors and keep open some of its branches under new ownership.

Open bank resolution will be unavoidable if the distressed bank is regarded as 'too big to fail'. The priority of the bank regulator in resolving a bank which is 'too big to fail' should be to attract new owners who can best ensure the safety of its deposits through prudent bank management, because the potential costs to taxpayers of further bank failure are so large. The incentives facing the owners for sound governance of the bank are critical. These can be strengthened if the owners have a valuable banking reputation to protect. Consequently, resolving a large bank by selling it to a well-established international bank is likely to maximise the incentives for its prudent management. Arranging such a sale is likely to take time, and hence it is essential for the regulator to preserve the value of the bank's assets until the resolution can be completed. In such cases, statutory management by the bank regulator, to ensure that a prudent asset management strategy is adopted, costs are controlled and loan recovery is pursued, may be necessary until ownership and control is transferred to the new owners. If the bank is government owned it is likely that all the bank's deposits are effectively guaranteed by government, and hence the drawbacks to statutory management noted above in the case of private sector banks are less relevant.

NOTES

1. Daumont, Le Gall and Leroux (2004) present data on, and analyse the causes of, banking failures in 10 sub-Saharan African countries during 1985–1995.

2. The Basle Core Principles for Effective Banking Supervision deals with intervention policy in principle 22: "Banking supervisors must have at their disposal adequate supervisory measures to bring about timely corrective action when banks fail to meet prudential requirements (such as minimum capital adequacy ratios),

when there are regulatory violations, or where depositors are threatened in any other way. In extreme circumstances this should include the ability to revoke the banking licence or recommend its revocation'' (Basle Committee on Banking Supervision, 1997).

3. Andrews and Josefsson (2003) list the procedures and measures involved in the take over of a bank by the regulator.

4. Resolution methods are detailed in Basle Committee on Banking Supervision (2002) and Hoggarth, Reidhill and Sinclair (2004).

5. The Financial Institutions Statute, 1993, was replaced by the Financial Institutions Act 2004, which upgraded banking regulations.

6. For three of the private sector banks, Greenland Bank, International Credit Bank and the Cooperative Bank, total loans and overdrafts at closure amounted to Shs 110 billion. By November 2002, only Shs 34 billion had been recovered by the liquidators (Bank of Uganda, 2002, p. 35).

7. A more detailed analysis of the intervention and resolution of these four banks can be found in Brownbridge (2002).

8. Repayment of all deposits was also extended to ICB. The fiscal cost of repaying the non-insured deposits was just under Shs 60 billion (about $40 million).

9. The BOU provided bonds to the acquiring banks to bridge the gap between the value of the deposit liabilities that they had assumed and the value of the Cooperative Bank's assets they had purchased. The remaining third of the deposits were transferred to UCBL, backed by bonds of equivalent value.

10. The recapitalisation took the form of government bonds issued to the bank to replace its non-performing loans, which were transferred to a government run loan recovery agency.

11. UCBL was the centre of a dispute between government and the Malaysian company that had purchased the 49% equity stake in 1998, which was subject to international arbitration. The dispute was finally settled when the Malaysian company gave up its claims to the equity, with 100% ownership reverting to government.

12. The regulator's policies to intervene in, and resolve, UCBL were supported by the Ministry of Finance.

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MICRO AND SMALL ENTERPRISE DEVELOPMENT IN SUB-SAHARAN AFRICA: A MACRO-ANALYSIS

Tidings P. Ndhlovu and Emmanuel Cleeve

ABSTRACT

This paper looks at the micro and small enterprise (MSE) sector from a macroeconomic perspective. Specifically, it examines the extent to which the MSE sector expands or contracts and the reasons behind this. It concludes that there is a great diversity in the development of the MSEs by sector and country. It also shows that MSE development is linked primarily to long-run structural processes, such as urbanisation and commercialisation in the rural areas rather than short-run cycles and policies.

1. INTRODUCTION

This paper seeks to explain why micro and small enterprises (MSEs) in less-developed countries (LDCs) have expanded or contracted as a result of changes in the macro economy. Analyses of MSE development have provided many different and often conflicting interpretations and conclusions, primarily because almost all our knowledge about MSE development is based on cross-sectional data sets, which are seldom strictly comparable.

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Theoretical and empirical models of MSE development mainly comprise inferences drawn from cross-sectional rather than continuous time-series empirical data. Consequently, attempts to interpret time-series phenomena from cross-sectional data are bound to be misleading.

Until recently, most empirical studies had been based on fairly small samples, often less than 100 enterprises and seldom more than a few hundred. By necessity, most studies have, therefore, also focused on only a part of the MSEs – e.g. a specific sector (manufacturing more often than trade), the smallest, the medium-sized, the urban, the rural, the poorest or the most successful – or treated the MSEs as if they were a homogeneous group. As a result, there have been endless discussions about the definitions of MSEs, at the expense of those on diversification and development of the sector.[1] In addition, different theories and models of MSE development have often been seen as alternative rather than complementary. Only recently have surveys with much larger samples been carried out in a number of African countries, and in some countries, consecutive surveys have been carried out. These surveys have permitted more disaggregated analyses and, in some cases, more detailed analyses of the dynamics. What follows outlines the key theoretical approaches to MSE development and offers an analysis of MSE dynamics based on data from Zimbabwe. To tease out the large national differences which may exist in the structure of MSE sectors, we also compare the MSE sectors in Zimbabwe, Kenya and Botswana. It is concluded that, despite data problems, there is uneven development of MSEs, depending on the particular industry/sector, and the MSE sector as a whole tends to be more sensitive to long-run structural processes rather than short-term events.

2. THEORETICAL APPROACHES TO MSE DEVELOPMENT

Major differences in theoretical approaches can be attributed to what these approaches identify as the driving force behind MSE development. One of the most important theoretical explanations regards excess labour supply, that is, one which cannot be absorbed in the public sector or large private enterprises, as the prime mover. This occurs in spite of poor pay and low productivity in MSEs. Equal significance is given to the formal sector's inability to satisfy demand for goods and services, or to supply them at prices which are affordable to consumers. This opens up a potential market for MSEs.

Arguably, the MSE sector develops in response to the growth in unemployment, functioning as a place of last resort for people who are unable to find employment in the formal sector. MSEs are expected to grow in periods of economic crisis, when the formal sector contracts or grows too slowly to absorb the labour force. Despite its general inefficiency and low levels of income, the MSE sector is the only alternative outlet for the desperately unemployed. However, in periods when formal employment grows, the MSE sector is assumed to contract again and, thus, develops an anti-cyclical relationship with the formal economy. This interpretation of the growth of the MSE sector after structural adjustment (SAP) has taken place is one of the most popular (see, e.g. Brand, Mupedziswa, & Gumpo, 1995; Daniels, 1994; Meagher & Yunusa, 1996).

Notwithstanding this, studies based on this theory of MSE development suffer from a number of empirical problems. For example, the lack of time-series data and the short life of many MSEs mean that data on growth estimates are likely to be incomplete, inconsistent and paint a completely distorted picture of how far the registered enterprise-establishments are a result of rapid replacement of enterprises or real growth in the number of enterprises. Without time-series data, it is impossible to show whether these increases took place before or after structural adjustment. Moreover, for the MSE sector to function as a place of last resort, it must be easily accessible. However, many studies have shown that this is the case only for a handful of MSE activities.

It is also sometimes argued that MSEs concentrate on trade because this requires less capital and knowledge than production (manufacturing). While this may well be true, it could equally be argued that small-scale trade is likely to require more working capital to secure a certain income than small-scale production. This is because the value added is lower for the trader than for the producer and, in small-scale production, the customer will often be required to pay for the materials in advance, while the small-scale trader will have to give credit (even more often than large formal retailers). This limits the extent to which the MSE sector can function as a place of last resort during crises. One study shows that while many Zimbabwean people embarked on MSE activities at the beginning of a drought, most ceased to do so as the crisis worsened because they had exhausted their working capital and their customers could no longer afford to buy the goods. Thus, in these circumstances the MSE sector became over reliant on family networks and patrons.

Parallel to the labour surplus theory is a whole new literature on de-agrarianisation. This relates the development of rural non-agricultural activities to surplus rural labour which, in turn, either supplements agricultural production with non-agricultural activities or migrants to the urban areas (Bryceson, 1996; Bryceson & Jamal, 1997). This implies a commercialisation of the rural areas, arising out of continuous growth in the informal economy, although the former would tend to focus more on the development of the urban MSE sector as a result of rural-urban migration.

In the case of output demand, the theory postulates that a prerequisite for the development of MSEs is that there be a market for their products and services. Therefore, the MSE sector will tend to develop a cyclical relationship with the economy as a whole. However, MSEs will also develop in competition with large enterprises in the formal sector, and their development will be constrained by formal sector monopolies. Structural adjustment and other policies that limit such monopolies, and attempt to create more competition, will therefore be advantageous to the MSEs because this may allow them to capture market shares from the large enterprises. Proponents of structural adjustment and stabilisation policies tend to base their arguments on this theory.

Empirical studies based on this theory tend to focus on the upper end of the MSE sector, particularly the manufacturing enterprises and the larger, more resourceful and successful MSEs, which have a potential to grow into the formal economy. These studies tend to propose strengthening of the MSEs through networks and clusters or via the creation of forward linkages with the formal economy, e.g. franchising and sub-contracting. This approach has not had much success in Africa due to problems of poor infrastructure and lack of trust on the part of both parties. This creates an unstable environment and, in turn, reduces the efficiency of the formal sector and access to factor markets for MSEs (e.g. see Liedholm & Mead, 1991; Grierson & Mead, 1995). For their part, formal sector enterprises appear to increasingly integrate vertically as a way of standing apart from the unstable environment.

Another strand of the output-demand theory links MSEs and the long-run development of the rural agrarian economy in an anti-cyclical relationship, to the detriment of agricultural production (see, e.g. Bryceson & Jamal, 1997). As a result of monetisation, commercialisation and urbanisation, the rural population turns to non-agricultural activities and the money economy. This creates a growing market for MSEs' goods and services.

Yet another approach to MSE development contends that as a result of industrialisation and economic growth, MSEs are likely to disappear and be replaced by modern large-scale industry. This theory has, however, been proved inaccurate in the sense that MSEs do not normally compete directly with large enterprises – otherwise they would not survive; rather, they tend to find niches in the factor and input markets where scale economies cannot be exploited by large enterprises. The most obvious activity where these niches exist is in distribution to areas or income groups where costs would be prohibitively high for large enterprises.[2]

3. MSE DEVELOPMENT IN ZIMBABWE

This section analyses the relationship between the theories discussed above and some empirical results of MSEs' development in a selected African country. The different explanations of MSE development should be seen as complementary theories, depicting simultaneous processes which influence different segments of the MSE sector at different times. We would, therefore, expect different parts of the MSE sector to develop differently over time.

We can look at the different theoretical explanations as propositions to be tested as follows:

- activities with easy access, which function as a place of last resort, would expand during downturns and contract during upturns in the economy (Theory I);
- activities that respond to markets would expand during an upturn in the economy and contract during downturns (Theory II);
- activities that develop as a result of long-run processes of commercialisation and monetisation in the rural economy would expand both during downturns and upturns in the shorter cycles of the economy (Theory III); and
- activities operating in direct competition with the formal sector would contract both during downturns and upturns in the economy (Theory IV).

To test such a composite theory ideally requires time series of disaggregated data for the development of the MSE sector. Such data are hard to come by. However, in Table 1 we present data for the sectoral composition of the rural non-agricultural activities in Zimbabwe in 1986, 1991 and 1993, respectively. Here the first period 1986–1991 represents a period of relative economic progress, while the second period 1991–1993 was a period of economic crisis. In the latter period, the introduction of structural adjustment measures and a serious drought coincided in 1992 and led to rapid price hikes and dramatically falling purchasing power for the majority of the population. Table 2 shows aggregated data for the main MSE activities in

Table 1. Sectoral Distribution of Small Rural and Urban Enterprises.

Sector	Rural			Urban	
	1986	1991	1993	1991	1993
	(Helmsing, 1991) (excl. small towns)	(Daniels, 1994) (incl. small towns)		(Daniels, 1994)	
Flour milling	0.7	+1.0	−0.4	0.0	+0.2
Beer brewing	6.3	+8.2	−2.9	0.0	+0.1
Tailoring and dressmaking	13.9	−5.8	−3.2	14.9	−11.8
Knitting	10.4	−9.2	−7.3	18.2	−15.1
Crocheting	6.9	+7.5	+12.4	16.4	+19.5
Shoe works and repairing	2.4	−1.0	+1.1	0.9	−0.1
Grass and cane	11.1	+20.0	−16.4	1.0	−0.6
Woodcarving	5.8	−5.1	−4.6	1.0	−0.6
Carpentry	2.1	+2.4	+2.6	1.7	−1.0
Pottery	6.7	−2.5	+3.6	–	–
Brick making	1.7	+2.6	−1.9	0.0	+0.1
Tinsmithing	1.7	−1.3	−1.2	0.3	−0.2
Welding and weld works	5.9	−0.6	+2.4	1.4	−1.1
Other manufacturing	4.9	+6.7	+7.4	10.7	−8.5
Total manufacturing	82.0	−73.9	−67.4	65.7	−58.5
Construction	7.6	−5.5	−3.8	1.4	−1.1
Trade	8.2	+18.1	+25.5	28.6	+35.6
Services	2.1	+2.8	+3.3	4.3	+4.8
Total	100	100	100	100	100
Total sample size	288	1815	–	3760	–
Estimated enterprises (th)		598	686	238	256
Growth in enterprises			7.1%		3.6%

Note: The 1991 and 1993 data are drawn from the GEMINI studies (Daniels, 1994) and the 1986 data from Helmsing (1991). All three data sets are based on household interviews in a random selection of rural areas in the country. Signs between the columns for different years show the direction of change during the period.

Table 2. Main Sectoral Distribution of MSEs.

Sector	1986	1991	1993	1998
	(Helmsing, 1991)	(Daniels, 1994)		(McPherson, 2000)
Food and beverages	7.0	+7.5	−4.9	+5.3
Textiles	31.2	+34.3	−32.8	−20.1
Wood and wood products	19.0	+21.1	−18.1	−9.4
Chemicals		0.2	0.2	+0.4
Non metallic minerals	8.4	−3.9	+4.1	−1.3
Fabricated metals	7.6	−2.3	+2.9	−2.6
Other manufacturing	4.9	−2.4	−1.9	+3.3
Total manufacturing	82.0	−71.6	−65.0	−42.4
Construction	7.6	−4.3	−3.1	−1.0
Trade	8.2	+21.1	+28.2	+45.2
Retail trade		20.4	+27.5	+44.6
Restaurants, hotels, bars		0.6	+0.7	−0.6
Services	2.1	+2.9	+3.5	+4.0
Transport		0.1	+0.2	+0.6
Total	100	100	100	100
Estimated enterprises (th)		868	942	860
Growth in enterprises			8.5%	−8.7%

Note: The 1991 and 1993 data are drawn from the GEMINI studies (Daniels, 1994) and the 1986 data from Helmsing (1991). All three data sets are based on household interviews in a random selection of rural areas in the country. Signs between the columns for different years show the direction of change during the period.

Zimbabwe, with the inclusion of statistics for 1998. This makes it possible to assess the impact of the post-crisis period, 1993–1998.

The heterogeneity of the MSE sector in Zimbabwe makes it very difficult to assess the impact of the SAP on this sector. The ways in which structural change in this period (1991–1993) might have affected the shape and size of the MSE sector include the following:

- Given the slow (and sometimes negative) growth in real gross domestic product and the high rates of population growth (2.5% per year), real per capita income fell over this period. The 1995 Poverty Assessment Study Survey reports that real wages and the incidence of poverty increased over the SAP period. Still, the effects of decreased consumer income on the MSE sector are not completely clear. If the products of the MSE sector are normal goods, then the lower purchasing power of consumers might be expected to translate into a decreased demand for such products (Theory II). It may be the case, however, that many products produced by the

MSE sector are inferior goods. That is, as purchasing power declines, demand for these products actually increases, as consumers substitute away from higher-priced goods produced by the formal sector or imported and towards MSE-produced goods (Theory I). For example, as real incomes fall, Zimbabweans might be expected to buy more second-hand or MSE-produced clothing rather than that sold by the formal sector.

- The liberalisation of Zimbabwe's trade regime is likely to have affected her MSE sector, though ambiguously. A reduction in trade barriers is likely to lead to lower import prices and a greater availability of imports. This could have a negative effect on MSEs in import-competing sectors; but this could have a positive effect on MSEs that use imported inputs. Since MSEs generally produce simple consumer goods for the domestic market, they are much less likely to be hurt by import competition than are larger formal sector firms.
- The liberalisation of the exchange rate led to a substantial weakening of the Zimbabwe dollar. One effect is that imported goods will become relatively more expensive and, as a result, one might expect a substitution toward MSE-produced goods. But, where imports (especially inputs) are complementary to the production processes of MSE products, the weaker Zimbabwe dollar will have a negative effect on the MSE sector.
- The liberalisation in agriculture described above might also reasonably be expected to have affected the MSE sector. For example, if the returns to farming rose as a result of structural adjustment, then some Zimbabweans who were engaged in MSE activity might have switched to agriculture, resulting in a decrease in the size of the rural MSE labor force. In addition, any increase in the returns to farming could have led to an increased demand for rural MSE products (Theory II) (see McPherson, 2000).

Unfortunately, similar data are not available for the urban MSEs in 1986, but only for the years 1991 and 1993. These data are also shown in Table 1. They show that the urban MSEs only make up 30% of the total. These will be analysed in more detail below.

A comparison of the pattern of change in the main sectors shows that the direction of change is the same in the three periods, i.e. a relative contraction of manufacturing and construction and an expansion of trade and services. This speaks in favour of a structural theory of type III or IV. However, the speed of change seems to be faster during the crisis period, which proponents of the labour supply theory, might see as indicating some degree of support for Theory I.

If we look in more detail at the sub-sectors within the manufacturing sector, the upper part of Table 1 shows that the small manufacturing activities are highly concentrated in a few sub-sectors: beer brewing (8.2% in 1991), dressmaking and tailoring (5.8%), knitting (9.2%), crocheting (7.5%), grass and cane products (20.0%) and wood carving (5.1%). In total, these six sub-sectors comprise at least 50% of all MSEs.

Although manufacturing activities, as a percentage of all rural non-farm activities, declined in both periods, this pattern does not hold for all sub-sectors. Only tailoring and dressmaking, knitting, wood carving, and tin smithing fell during both periods, dropping from 32% to 16% of all non-farm activities. In particular, tailoring and dressmaking, which dominate the group of sub-sectors, have decreased rapidly in both relative and absolute terms during both periods. On the other hand, knitting and woodcarving have decreased more moderately and have arguably experienced a small absolute increase especially during the first period. Because these sub-sectors often produce relatively high-quality products and also have access to tourist and export markets. Thus, they are able to withstand more severe competition from formal industry and imports than the tailoring sub-sector.

The fact that tailoring and dressmaking should be hit by the long-run structural decline depicted in Theory IV (i.e. scale economies) corresponds to our expectations because the sub-sector appears to have contracted even more rapidly before rather than after the implementation of structural adjustment programmes.

The sub-sectors crocheting, carpentry and other manufacturing have grown in relative terms in both periods, from 13% in 1986 to 22% in 1993, thus corresponding to Theory III (as a result of monetisation and commercialisation). The fact that 'other manufacturing' has grown in both periods corresponds well with our expectations of a gradual diversification of the economy as part of the structural transformation of the economy. It is more surprising to find crocheting here, which is the most important sub-sector in the group. Crocheting grew especially rapidly during the second period, probably because it has been used for bargaining in the informal import trade from Botswana and South Africa, which has increased rapidly after the initiation of the structural adjustment programme (Brand et al., 1995).

Food processing, grass and cane products and brick making expanded their share of production during the upturn and contracted during the downturn. This could be an indication of a cyclical market orientation as per Theory II (output demand). However, for both food processing and grass and cane products, the contraction during the drought period was likely to be a consequence of the lack of raw materials rather than the paucity of the market.

Finally, pottery, welding and shoe making and repairing contracted during the upturn and expanded during the downturn. They thus seem to follow the labour supply theory of type I. This is, however, not very logical as neither welding nor pottery can be said to be easy entry sectors. Both require considerable technical knowledge and, in the case of welding, relatively large investments. Shoe repairing could better be considered an easy entry sector, but it only grew very slowly during the crisis period.

For the MSEs in the urban areas, we only have data for the crisis period 1991–1993 (see Table 1). These data show that the urban areas make up less than 30% of all the MSEs, which is still an over-representation relative to the total population, of which only 25% is urban.

The number of small urban enterprises grew by only 3.6% per year during the period (the number of people working in the small urban enterprises appear to have increased even less) (Daniels, 1994). This is, however, less than half of the growth in the number of small rural enterprises (7.1%), and probably also less than the increase in the urban population during the period. This does not appear to support the hypothesis that increased urban labour supply during the crisis should have led to a growth in the number of MSEs (Theory I).

Although there has been a tendency to contraction, especially in the public formal sector in many African countries (as a result of the structural adjustment), this has seldom led to a large absolute decline in the formal urban employment. *Therefore, the number of formal employees actually retrenched is small relative to the national labour market.* Unemployment is, of course, more significant for the urban labour market but, even here, the numbers are so small that only empirical studies based on very large samples will be able to register the decline. Studies of MSEs after structural adjustment, therefore, do not generally show retrenched employees among the small-scale entrepreneurs (see, e.g. Brand et al., 1995). The large number of urban youth and rural migrants entering the urban labour market every year, whether there is a crisis or not, is much more critical to urban unemployment. Moreover, falling real wages in the formal sector is likely to be a much more important reason for employees or their wives to start an MSE than retrenchment. That fall in real wages is not just a result of structural adjustment but is a consequence of processes that started much earlier.

The data in Table 1 on the sectoral distribution of the urban MSEs show that they are much more concentrated in a few sectors than are the rural MSEs. The urban MSEs are especially concentrated in petty trade, which comprised 28.6% of all the urban MSEs in 1991, growing to 35.6% in 1993.

The manufacturing sector – tailoring and dressmaking, knitting and crocheting – which together accounted for 49.5% of all the MSEs in 1991, fell to 46.4 % in 1993. Of the four sub-sectors, only tailoring and knitting were scaled down, while both crocheting and dressmaking increased rapidly. Thus, in the urban areas, there has been a concentration of MSEs in low-income, easy-access sectors during the crisis, which might speak in favour of the labour supply theory. However, the dominance of these sectors, even before the crisis, indicates that this growth (in the low-income sector) has not been specific to the crisis period. Rather, it is a continuation of more long-run processes of urban migration and the increasing participation of women in the urban labour market, which has taken place since independence in 1990 (see, e.g. Brand et al., 1995). And even in this case, we must note that 'easy entry' into a sector of typically masculine work will not attract female workers, and the other way around. When construction contracts and pottery expands, assuming that the former is male-dominated and the second is female-intensive, we are unlikely to see a flow of construction workers into pottery – even if we define entry to be 'easy' for particular sectors. It is with these problems in mind that Daniels (1994) concludes that enterprises in high-profit sectors tend to behave as expected by the output-demand theory, while enterprises in low-profit sectors rather follow the labour supply theory.

We can conclude, from the data for 1998 (Table 2) representing the post-crisis period, that SAP have not led to many significant changes in the structure of the MNE sector in Zimbabwe. Apart from food and beverages, chemicals and other manufacturing, showing positive changes from negative ones during the crisis period, for all other sectors the direction of change has remained the same for both periods. In the post-crisis period, the total number of MSEs fell by 8.7%. The fall was entirely a rural phenomenon; during the post-crisis period, the numbers of urban MSEs rose substantially. As a result, the distributional structure of MSEs has been altered such that, in 1991, 29.3% of all MSEs were located in urban areas but, by 1998, 38.5% of MSEs had become located in urban areas. This may be the result of the liberalisation in agriculture and the increased returns to farming.

4. DIFFERENCES IN THE STRUCTURE OF THE MSE SECTOR IN AFRICA

A fundamental point suggested by the preceding analysis is that observed changes are likely to result from long-run structural changes rather than short-run cycles and measures. Therefore, discussion must also focus on the nature of long-run structural changes. In a literature survey on macro analyses of micro enterprises in developing countries, Liedholm and Mead (1993) came to the conclusion that macro-level empirical evidence indicates that, as aggregate per capita income increases, there is a systematic pattern of evolution of small- and medium-sized enterprises towards larger firms based in larger localities, producing more modern products.

However, critics of this view argue that analyses of MSE development must take account of differences in their efficiency, the type of influence MSEs exercise in society, linkages between small and large enterprises, the changing roles of women entrepreneurs, differences in the level of education in the labour force and other socio-economic differences.

Comparison of the size and sectoral composition of the MSE sectors in Zimbabwe, Kenya and Botswana (see Table 3), make it possible to consider socio-economic differences within an African context. To illustrate the survival of MSEs and the complex nature of this analysis, the table shows that the size of the MSE sector is twice as large in Zimbabwe as in Kenya even though per capita income is twice as high in Zimbabwe. This is also surprising because Kenya is known as having a policy, which has been favourable to the MSE sector, while Zimbabwe's policies have clearly favoured large industry.

A closer look at Table 3 reveals that the difference between Zimbabwe and Kenya is almost entirely due to a very large number of clothing enterprises and grass and cane weavers in Zimbabwe. If they are left out of the distribution, the number of enterprises per 1,000 inhabitants is very close to that in Kenya. From a sectoral perspective, this very large MSE clothing sector in Zimbabwe is difficult to explain, as Zimbabwe has a much larger and more efficient large-scale clothing industry than Kenya and a clothing retail sector which is dominated by large retail chains.

The existence of so many small clothing enterprises in Zimbabwe means that two thirds of all the MSEs are manufacturing enterprises against only one third in Kenya. Correspondingly, retail trade makes up two thirds of the MSEs in Kenya but only one third in Zimbabwe. However, in absolute terms, the number of enterprises per 1,000 inhabitants within the sector is of approximately the same size in the two countries. Given the importance of large retail chains in Zimbabwe, this can only be explained by the larger per capita income in Zimbabwe. Presumably, this leaves a market for the small retailer in spite of competition from the chain stores.

As a result of the large number of small clothing enterprises, a much larger share of the MSEs is owned by women in Zimbabwe than in Kenya. This could be a result of the higher per capita income and a more monetised Zimbabwean economy, which encourages more women to earn cash

Table 3. The Structure of MSEs in Africa: Kenya, Zimbabwe and Botswana.

	Kenya (1995) (Daniels et al., 1995)		Zimbabwe (1993) (Daniels, 1994)		Botswana (1992) (Daniels & Fisseha, 1992)	
	Urban	Rural	Urban	Rural	Urban	Rural
Food, beverages and tobacco	5.7	8.7	0.3	6.6	9.1	16.7
Textile and clothing	4.2	7.1	50.8	26.0	6.0	10.0
Wood, grass and cane	3.5	8.2	2.3	24.0	0.8	1.4
Non-metallic minerals	0.1	14.2	0.7	5.7	1.9	1.1
Metals	1.6	—	1.3	3.6	0.6	0.7
Other manufacturing	0.4	—	1.0	0.8	1.6	0.8
Manufacture (without repairs)	15.5	38.3	56.3	66.7	20.0	30.7
Construction	0.4	0.5	1.1	3.8	0.2	0.0
Wholesale	1.4	—	0.1	0.0	0.1	0.7
Retail	63.4	51.4	35.0	25.5	51.4	46.8
Hotels, restaurants, bars	10.0	4.9	0.5	0.7	15.0	19.3
Services (incl. repairs)	9.4	4.9	7.3	4.2	13.6	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
No. of enterprises/1,000 inhabitants	49	30	93	84	30	20
Manufacturing enterprises/1,000 inhabitants	8	11	53	56	11	9
Retail enterprises/1,000 inhabitants	31	15	33	21	15	9
Pct. enterprises run by women	43%		71%		76%	
Average no. working per enterprise	1.89	1.58	1.57	1.67	1.74	1.88
Enterprises distributed by employment size (%)						
1 person	57		78		66	
2–5 persons	42		19		29	
6–50 persons	1		3		5	
Total	100		100		100	

incomes. However, the large number of small clothing enterprises is not a result of the structural adjustment policies and the drought, because their number was even larger in 1991 than in 1993.

Although the average size of the MSEs is about the same in Zimbabwe and Kenya, the many small clothing enterprises mean that the share of one-person enterprises is much larger in Zimbabwe (78%) than in Kenya (57%), and the share of enterprises with two to five persons correspondingly smaller (19% as against 42%). On the other hand, there are also more of the largest groups of MSEs (6–50 persons working) in Zimbabwe (3%) than in Kenya (1%). Surprisingly, the existence of a large number of small clothing enterprises in Zimbabwe also means that the small urban enterprises in Zimbabwe are smaller than the rural ones. This is contrary to Kenya and also to our theoretical expectations, because market access tends to be better in urban than in rural areas. Thus, for Kenya, Hosier (1987) has shown that, while rural enterprises primarily produce-to-order, more urban enterprises produce in larger batches for the market.

In Table 3, we also compare Zimbabwe with Botswana, the latter having a per capita income almost three times that of the former. The Botswana data show that the size of the MSE sector is much smaller than in both Kenya and Zimbabwe. Thus, although the share of women-owned enterprises is larger than in Zimbabwe, the number of women entrepreneurs per 1,000 inhabitants is much smaller, and the pressure on women to earn a cash income appears to be less. Furthermore, women are not as concentrated in the clothing sector as in Zimbabwe, but appear to be more widely spread over different sectors. Probably, due to the large share of women entrepreneurs, there are more one-person enterprises (66%) in Botswana than in Kenya, but not as many as in Zimbabwe. On the other hand, the number of enterprises in the largest group of MSEs is larger (7%) than in both Kenya and Zimbabwe, which still means however that, in absolute terms, there are fewer of these medium sized enterprises per 1,000 inhabitants than in both Kenya and Zimbabwe.

Are these findings an indication that the share of the largest group of MSEs increases with per capita income as both the economic theories and the 'aggregate empirical evidence' indicate? This is not the case when we look at the absolute number of enterprises per 1,000 inhabitants. Besides, the share of one-person enterprises appears to depend primarily on the structure of labour markets within different social contexts, for example, the ease with which women can enter the non-agricultural labour market or the structure of the educational system. Thus, change is likely to occur in the long-run rather than short-run.

5. CONCLUSIONS

These results indicate that there is a great diversity in the development of MSEs, by sector. But the results also indicate that the development of MSEs is linked primarily to long-run structural processes, such as urbanisation and commercialisation in the rural areas. This contradicts the current policy debate, which tends to discuss MSE development in a context of relative short-term events such as structural adjustment, droughts and cycles in the formal economy. Clearly, such events have an impact on the MSEs, but the impact is likely to differ from activity to activity, and the MSE sector as a whole is likely to increase whether there is a crisis or not, although it may not be the same sub-sectors which are growing in different periods.

Clearly, when comparing the MSE sectors in Zimbabwe, Kenya and Botswana, the MSE sector cannot be explained by simple one-dimensional models, but must be linked to the development of both the formal urban economy and the rural agricultural economy, and to the development of both labour markets and the structure of the demand for MSE products.

NOTES

1. For our purposes, an MSE (usually in the informal economy) may be defined as a business activity that employs 50 or fewer workers and markets at least 50% of its output.
2. This is perhaps the reason why many MSEs specialise in retail trade.

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RISK BEHAVIOUR AND GROUP FORMATION IN MICRO-CREDIT GROUPS IN ERITREA

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ABSTRACT

This paper aims to provide new insights into the empirical relevance of the homogeneous matching hypothesis for micro-credit groups in Eritrea. Our main results strongly indicate that groups are formed heterogeneously. Most importantly, we do not find support for the matching frictions hypothesis. Even if we control matching frictions, credit groups in Eritrea do not seem to consist of borrowers of similar risk types.

1. INTRODUCTION

The performance of micro-finance institutions is constantly being debated quite extensively in the literature (for a fairly recent survey, see Morduch, 1999). The debate has focused on the (unconventional) methods that micro-finance institutions use to improve borrowers' payback behaviour. The theoretical literature, especially, deals with the implications of group-lending practices with jointly liable borrowers (see, e.g. Ghatak & Guinnane, 1999).[1] A joint liability contract specifies that the entire group is liable for loans that

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are given to individual group members. A well-known example is the Grameen Bank's group-lending programme. It has been emphasised that group lending with joint liability may lead to 'peer-monitoring or peer-pressure' among group members, which reduces problems of 'moral hazard' and 'enforcement' (Besley & Coate, 1995; Stiglitz, 1990). A reason is that a high joint liability component in the debt contract provides incentives to borrowers to choose a safe investment project.

A recent group of theoretical papers has emphasised that joint liability induces group members to self-select each other (e.g. Ghatak, 2000). These papers argue that the optimal outcome is one in which all borrowers with the same probability of success group together (homogeneous matching). It has also been argued that the optimality of homogeneous matching only holds in a frictionless world (Sadoulet & Carpenter, 2001 and references therein). However, the real world is characterised by frictions due to, e.g. imperfect information, the unavailability of partners with the same risk characteristics, the inability to enforce contracts and the inability to fully screen and monitor group members. The advocates of the matching frictions theory argue that heterogeneous matching might take place, but that the heterogeneity is entirely due to so-called 'matching frictions'. In other words, the matching frictions theory suggests that there will be homogeneous matching if one controls matching frictions. If there are matching frictions leading to some heterogeneity, the matching is still 'essentially homogeneous'; heterogeneity is simply due to frictions and therefore generates deviations from optimality. Yet, empirical evidence on the homogeneous matching hypothesis, in general, and the matching frictions theory, in particular, is lacking. One of the few exceptions is Sadoulet and Carpenter (2001) for micro-credit groups in Guatemala.

This paper takes up the challenge by aiming to examine the empirical relevance of the homogeneous matching hypothesis for micro-credit groups in Eritrea. We conducted a survey (personal interviews) in 2001 among members and group leaders of borrowers who accessed loans from two micro-credit programmes in Eritrea.[2] The data are collected using random sample selection mechanisms in areas where the micro-credit programmes are active. We interviewed around 350 group members. Out of these 350 group members, 102 are group leaders.

The survey includes questions related to the group formation process and provides information that can be used to test the matching frictions hypothesis.

The paper is organised as follows. Section 2 provides information on micro-credit groups in Eritrea. Section 3 surveys the group formation and the homogeneous matching literature that is most closely related to our paper. In Section 4, we explain the methodology we use to test the matching frictions hypothesis. In Section 5, we explain how we measure risk, a variable needed to test homogeneous matching. Section 6 presents two groups of independent variables that are assumed to affect risk behaviour. In this section we also apply factor analysis to regroup these variables into a smaller number of factors. In Section 7, we estimate risk behaviour. The results of this equation are used in Section 8 to test whether homogeneous matching holds if matching frictions are accounted for. Finally, Section 9 concludes.

2. ORGANISATIONAL PROFILE OF GROUP-LENDING PROGRAMMES IN ERITREA

2.1. General Information

In Eritrea, there are two micro-finance institutions. The first one is the Saving and Micro-Credit Programme (SMCP), which has been operating as a component of the Eritrean community development fund (ECDF) since July 1996. The other one is the Southern Zone Saving and Credit Scheme (SZSCS) that has been launched by the Agency for Co-operation and Research in Development (ACORD) in 1994. While the immediate objective of both programmes is to provide access to credit and saving to people who are outside the orbit of the formal banking network, their long-term objective is to strengthen their institutional setting and establish the legal, regulatory and judicial framework for the micro-finance sector of Eritrea.

The government of Eritrea, the World Bank (IDA) and loans and grants from donors are the main sources of funds for SMCP. The SZSCS is financed by ACORD. ACORD is primarily funded by NGOs from the UK and other parts of Europe.

2.2. Details of the Loan Contracts

The two micro-finance institutions in Eritrea use the principle of joint liability. Since there are substantial differences in how micro-finance institutions employ the concept of joint liability, it is useful to provide some details of the type of loan contracts that are used. It is also relevant to describe how these institutions provide incentives to improve payback behaviour.

The two micro-credit programmes in Eritrea distribute loans on the basis of standard group-lending mechanisms. In the case of SMCP, a promoter visits a certain village or rural town and organises a meeting to inform the inhabitants of the advantages and benefits of the programme and to advise them on how to form a village bank (VB). If they agree and form an autonomously functioning VB, containing 35–105 members, they will elect three people to run the VB. This administrative body is called a Saving and Credit committee. The village (Kebabi) administrator acts as a chairperson while the other two people are responsible for accounts and record keeping. The members of the VB receive further training. Based on this training they are guided to organise themselves into solidarity groups, with three to seven members.

In the case of SZSCS, a promoter of the programme comes to a certain village and explains to the residents how the scheme works. If the people agree to organise themselves they receive further training to form – as with SMCP above – solidarity groups consisting of three to seven people. These solidarity groups will then organise themselves into an assembly called a Credit and Saving Group (CSG). This CSG then elects five persons from a village or town Credit and Saving Committee (CSC) to run the CSG. The CSG of the SZSCS is somewhat comparable to the VB of the SMCP. The main difference is that, in the case of a VB, the promoter of the micro-credit programme has partly delegated the decision on distributing loans to the VB, whereas the CSG only screens and monitors borrowers.

All possible borrowers have the freedom to choose their fellow group members. However, they are advised to form a group with people they know and trust. Moreover, members of the same family are not allowed to be members of the same group and all members in a group have to live in the same village.

Group members from both programmes become eligible for loans only after having successfully accumulated a certain amount of mandatory savings within a period of 3 months. This amounts to 10% of the requested loan amount for borrowers from ECDF and 5% of the requested loan amount for borrowers from SZSCS.

Before a group member can get a loan, the other members of the group need to agree with the loan request. If they do so, the group forwards the request to the village committee. In the case of SMCP, all loan applications are processed in the VB before they are forwarded to the regional SMCP credit officer for final decisions and payments. However, repeated loans are processed during VB monthly meetings and loans are granted on the spot. In the case of SZSCS (ACORD) loan applications forwarded by borrowing groups are screened and approved by the village CSC . Once approved, the credit officer (an employee of the SZSCS) will forward the loan, after further evaluation, to the borrowing group during one of the monthly group meetings.

Borrowers of both programmes also need to provide information on the purpose of the loan. If a group finds out that the loan is used for other purposes, the borrower will be forced to pay back the loan immediately. Groups have their own rules in enforcing the pay back of the loans. In extreme cases, they can take the borrower to the village administrator and court of law to get the money back. If a borrower uses the loan for other purposes, because of social problems, and if group members are convinced that they can pay back the loan, the group can decide to let them continue with the new project.

All loan contracts take place between the programme and individual group members. However, the other group members need to attend the meeting where the contract will be signed and need to co-sign the contract. So, the monthly instalments and repayment period are agreed upon simultaneously.

Since all members of a group co-sign the debt contracts of the individual borrowers, each member of a group is liable for the repayment of the loan. If a borrower fails to repay the monthly payments, the other group members are obliged to pay for the borrower. If the group fails to cover the unpaid sum of one of the group members, the entire group will be denied any further loans from the programme. Moreover, they are not allowed to start a new loan cycle by joining other groups in any of the two programmes, or to begin a new group.

Loans to be forwarded to borrowers are arranged in a progressive manner. In both programmes there are seven loan cycles, but the maximum loan sizes differ. Table 1 presents information on the maximum amount that can be borrowed during the different loan cycles.

Thus, the loans forwarded to borrowers from SMCP range between 1,000 and 10,000 Nakfas, although individuals are allowed to withdraw less if they want to. Nafka is the Eritrean Currency. The official exchange rate is US$ 1 = 14 Nakfas. Loans from SZSCS range between 1000 and 8000 Nakfas. It should be noted that group members of a certain group need not be in the same loan cycle. If a member has the ability to pay the loan faster than the others, he or she can apply for a new loan if the other group members are willing to guarantee this loan. A borrower from the SMCP could even be

Table 1. Maximum Loan Sizes in the Different Loan Cycles.

	SZSCS		SMCP	
	Loan Size	Maturity	Loan Size	Maturity
1	1,000	3–24 months	1,000-	3–24 months
2	2,000	3–24 months	2,000	3–24 months
3	3,000	3–24 months	3,000	3–24 months
4	4,500	3–24 months	5,000	3–24 months
5	6,000	3–24 months	7,000	3–24 months
6	7,000	3–24 months	8,500	3–24 months
7	8,000	3–24 months	10,000	3–24 months

promoted to an individual loan programme, after he or she has finished the seven loan cycles successfully. This possibility, however, did not yet exist when the survey took place. Borrowers from SZSCS do not have the possibility of getting individual loans within the programme. Graduates from this programme get a promotion certificate and are expected to find other sources of credit from the financial market. For both programmes, the maturity period is determined based on a mutual understanding between the loan officer and the borrower. It ranges between 3 and 24 months. SMCP charges a 16% interest rate, while the interest rate for borrowings from SZSCS is 14%. In both cases, this is above the interest rate as charged by commercial banks in Eritrea. The interest rates these banks charge range between 9% and 12%.

3. OTHER LITERATURE ON GROUP FORMATION AND HOMOGENEOUS MATCHING

Most of the matching literature draws heavily from the work of Becker (1993), who has worked extensively on marriage matching theory. Ghatak (1999) presents a simple model that explains why self-selection of groups will lead to homogeneous matching. Here, we explain the main insights.

The main reason why the theoretical literature argues that borrowers with equal risk profiles will form groups is that the value of having a safe partner is positive for all individuals and increasing in the own probability of success. This implies that the gain for a risky borrower in joining a group with a safe borrower is always lower than the loss for a safe borrower in forming a group with a risky borrower. Hence, a risky borrower cannot cross-subsidise a safe borrower in order to be accepted as a partner, leading to groups containing partners of equal risk.

One of the most sophisticated theoretical models on the homogeneous matching hypothesis was provided by Ghatak (2000). He shows that if lenders are able to offer a continuum of debt contracts, containing different values for the interest rate and the joint liability component, incentive compatible separating equilibria may result. The safe types prefer a combination of a high joint liability component and a low lending rate, whereas the opposite will hold for a risky borrower. In this way, a lender may obtain information on the type of the borrower.

Laffont (2000) shows the role of group lending in differentiating between borrowers of different types (adverse selection). He states that group-lending contracts offer a subtle method of discrimination between borrowers. When collusion between borrowers under complete information is allowed, group lending improves discrimination between entrepreneurs of different types. So, similar types match together.

Sadoulet (1999) presents a model that challenges the commonly assumed homogeneous matching hypothesis. In his model, group membership is endogenous and group performance depends on both members' types and on the distribution of those types. According to Sadoulet, group members choose partners in a context of missing insurance markets. The point he wants to make is that if insurance markets are missing, homogeneity is not optimal anymore. Heterogeneity emerges as a constrained first-best choice. Sadoulet suggests that members set up insurance arrangements within their group in which partners will cover each other's loans in case of project failure. The reason for insurance is that borrowers live and work in risky environments and hence need insurance. If a member who is able to insure a partner in need refuses to pay for the latter, he will lose access to future loans from the programme because of the joint liability principle. The insurance arrangement is taken to be an important part of the group formation process. To this end, Sadoulet's model suggests a non-monotonic matching pattern in which safer borrowers will always form groups heterogeneously with partners riskier than themselves. Middle-type borrowers match either heterogeneously with safer borrowers or homogeneously with borrowers of their type, depending on whether these are available. Finally, the riskier borrowers match homogeneously. Note that the models by Ghatak (1999) and Sadoulet (1999) are similar. Ghatak obtains homogeneous matching as a result since his model is static, whereas Sadoulet's model results in heterogeneous matching since it is dynamic. Moreover, in the model by Ghatak, the benefit of homogeneous matching is that it improves repayment rates and, thus, leads to lower interest rates. The problem is that the decrease in the interest rate cannot compensate the safe borrowers for having to cover the risky borrowers' loans when they fail. So, safe and risky borrowers will not form groups. In the model by Sadoulet the benefit is not lower interest rates, but access to future loans, which has more direct value.

Armendariz de Aghion and Gollier (2000) state that, in urban economies with heterogeneous, anonymous and relatively mobile borrowers, random (rather than assortative) matching is incentive compatible for all types of borrowers. A particular feature of their paper is that they assume that borrowers do not know each other. They show that cross-subsidisation among members provides a kind of a collateral that reduces the negative externalities from risky to safe borrowers. The main implication of their work is that, as we move away from village economies by allowing imperfect information, assortative matching no longer leads to an equilibrium, and yet group lending can improve efficiency and enhance welfare.

There are few empirical studies available that have rigorously tested the homogeneous matching hypothesis. Most empirical studies simply assume that homogeneous matching takes place. A few studies, however, do provide some insights. For instance, Van Tassel (2000), for groups belonging to BancoSol, Bolivia, found that groups match heterogeneously in unobservable business characteristics.

The only empirical paper available that has rigorously tried to investigate the matching of group members is the one by Sadoulet and Carpenter (2001). For credit groups in Guatemala they estimated the relationship between risk and the level of risk heterogeneity in the individual groups, explicitly accounting for the endogeneity of group formation and for borrowers' choice of project risk. Their results show that borrowers in Guatemala group heterogeneously and that the heterogeneity cannot be explained by matching frictions. In line with an earlier theoretical paper by Sadoulet (1999), they suggest that borrowers might want to form heterogeneous groups in order to set up insurance arrangements.

4. METHODOLOGY: THE ROLE OF MATCHING FRICTIONS

We follow the methodology set out by Sadoulet and Carpenter (2001). The reader is referred to their paper for a detailed explanation of the methodology. The main problem we have to deal with is as follows. In a frictionless world, the assortative matching theory implies that all borrowers will choose their first-best risk level, and will match together with partners with the same (first-best) risk level. However, if there are matching frictions, borrowers may be forced to match with partners of a different risk level, even if they prefer to match with borrowers of the same risk type.

The matching frictions theory states that homogeneous matching only holds in a frictionless world and that all heterogeneity comes from matching frictions. This implies that there should be no statistically significant relationship between first-best risk (risk in a frictionless world) and heterogeneity. In order to test this theory, we need indicators for first-best risk and matching frictions. The problem is that these variables are not observable. Sadoulet and Carpenter (2001) solve this problem as follows. If there are matching frictions, the level of risk heterogeneity of borrower $i(h_i)$ depends on his or her first-best risk choice (r_i^*) and on matching frictions (f_i):[3]

$$h_i = H(r_i^*, f_i) \tag{1}$$

Since, with matching frictions, borrowers may not be able to match with their preferred partners, they may decide to adjust their own risk choice. This implies that the risk level a borrower chooses (the observed risk, r_i) is a function of characteristics that affect the first-best risk choice (X_i) and the heterogeneity the borrower is confronted with, i.e.

$$r_i = R(X_i, h_i) \tag{2}$$

If Eq. (1) is substituted in Eq. (2), a reduced form expression for the observed risk level can be obtained:

$$r_i = k(X_i, f_i) \tag{3}$$

The full system of equations (the structural model) can now be specified as

$$h_i = H(r_i^*, f_i) \tag{4}$$

$$r_i = k(X_i, f_i) \tag{5}$$

$$r_i^* = k(X_i, 0) \tag{6}$$

If the matching frictions hypothesis holds, $\partial h_i / \partial r_i^* = 0$. It may be useful to compare this condition with the condition for homogeneous matching in a frictionless world. In a frictionless world, with homogeneous matching, h_i should be zero in all groups. So, heterogeneity between all members within a group and hence group heterogeneity will then be zero. In this situation, the test for homogeneous matching could be based on a measure of group heterogeneity. Simply testing whether this measure is equal to zero would do. However, with matching frictions, h_i does not need to be equal to zero. The correct test is $\partial h_i/\partial r_i^* = 0$, which implies that homogeneous matching cannot be confirmed or rejected by testing whether a measure for group heterogeneity differs from zero. In order to correctly test the matching frictions theory, we need variables for risk and heterogeneity at the individual level. The risk level individual borrowers choose depends on the heterogeneity they are faced with. In the next section we will explain how we measure risk. Section 8 will explain how we measure heterogeneity.

We first need to estimate the actual risk equation, for which we take, for reasons of convenience, a linear specification:

$$r_i = X_i\alpha + f_i\beta + \varepsilon_i \tag{7}$$

From this regression, estimated values for first-best risk and matching frictions can be obtained:

$$\overline{r_i^*} = X_i\overline{\alpha} \tag{8}$$

$$\overline{\beta f_i} = f_i\overline{\beta} \tag{9}$$

These estimated values are then substituted in the equation for heterogeneity:

$$h_i = \alpha + \gamma\overline{r_i^*} + \delta\overline{\beta f_i} + \varepsilon_i \tag{10}$$

Homogeneous matching will be empirically confirmed if $\gamma = 0$. It is expected that $\delta \geq 0$.

5. MEASUREMENT OF RISK

The first step in the analysis is to develop a measure for risk, which is needed to estimate the risk equation (Eq. (7)). Note that in the theoretical models it is assumed that there is only one project available per individual, which implies that projects and borrowers are interchangeable. This also implies that the theoretical measure for risk refers to both the riskiness of the borrower and the project. However, empirically, there is no perfect measure for this theoretical risk concept available. We proxy the theoretical concept of risk by developing a measure for the risk of a borrower's repayment strategy. Even this is not directly measurable and, therefore, has to be proxied by an (admittedly imperfect) indicator. In line with Sadoulet and

Carpenter (2001), we proxy risk (r) by

$$r_i = \frac{P_i - S_i}{P_i} \quad \text{for } P_i \geq S_i$$

and $r_i = 0$ for $P_i < S_i$ where P_i is the loan payment due per month and S_i is the amount the borrower reported having saved 1 week before the due date to cover the loan payments.[4] The risk indicator varies between 0 and 1.

The data needed for our risk measure were obtained by interviewing around 350 group members. These group members borrow from either the SMCP or the SZSCS. We promised the borrowers to make their answers anonymous, so as to give them an incentive to tell the truth. The interviews were conducted by graduate assistants from the University of Asmara.

We consider loan payments due per month, since for the two micro-finance programmes in Eritrea, the instalments that members are supposed to make are monthly. In the questionnaire, we asked the borrowers to specify the agreed install payment per month (P_i). We also asked borrowers to specify the average cumulative savings until 1 week before due date (S_i). Table 2 gives information on the risk measure and the variables used to construct this measure. The table also provides data on the credit amount. The value of loans ranges from 750 Nakfas to 8,500 Nakfas, with mean and median loan size of 3,961 and 3,500 Nakfas. Loan terms vary between 3 months and 24 months. The mean of our risk indicator is about 0.17, with an even lower median (0.09). Of the 351 borrowers, 105 are left censored on the risk measure ($r = 0$), 10 are right censored ($r = 1$) and 236 are

Table 2. Information on Credit and Risk.

	Credit Size	*P*	*S*	*r*
Mean	3,961	422	356	0.17
Median	3,500	380	300	0.09
Maximum	8,500	2,320	2,080	1.00
Minimum	750	71.25	0.00	0.00
Std. Dev.	1,802	315	272	0.213
Skewness	0.468	2.714	2.440	1.967
Kurtosis	2.406	13.008	12.257	7.761
Jarque-Bera	17.97	1895.87	1601.76	557.80
Observations	351	351	351	351

Note: For a list of variables see the appendix. All values (except for r) are in Nakfas. The Jarque-Bera statistic is a test for normality. The statistic has a χ^2 distribution with two degrees of freedom under the null hypothesis of normally distributed errors.

uncensored ($0<r<1$). Since $r=0$ for a relatively high percentage of the group of borrowers, many borrowers show a tendency to save enough to repay the full monthly amount by the third week. Thus, borrowers seem to show a high degree of punctuality and readiness to save ahead of time in order to be sure to get future access to credit from the programme. Note that none of the variables is normally distributed.

It should be noted that a possible caveat of our risk measure is that a person who gets a fixed payment (more than P_i) in the week before the payment can be very safe despite the fact that $S_i=0$. However, we do not think that this will substantially affect our results since this does not seem to happen often in practice. Related to this problem, the validity of our measure may depend on the time profile for the different projects. Our measure may incorrectly give a higher risk ranking to a borrower with a project that yields an uncertain amount of income in the first week as compared to another borrower with a project that yields a certain amount of income in the fourth week. Since it is impossible to obtain detailed information about the time profile of returns for the different projects the loans are used for, we cannot solve this problem. However, given the fact that the bulk of loans by the two programmes in Eritrea are forwarded for the same purposes (trading), so that the time profile of most of the projects the loans are used for are probably similar, we are reasonably convinced by the validity of our risk proxy. Table 3 provides details about the use of the loans.

Almost all borrowers from the two programmes are self-employed. They perform different activities ranging from trading, farming and manufacturing to different kinds of services. Trading is the activity most borrowers carry out, followed by farming and service giving and manufacturing, or a job as daily labourer. Both micro-credit programmes do not allow loans to be used for consumption purposes. The loan has to be invested in income generating activities.

Table 3. Loan Purpose (Number of Individuals; Percentages in Parentheses).

	Trading	Farming	Raw Materials	Equipments
Loans $\leq$ 3000	96 (27.4)	39 (11.1)	19 (5.4)	16 (4.6)
3000 $\leq$ L $\geq$ 6000	86 (24.5)	6 (1.7)	35 (10)	12 (3.4)
6000 $\leq$ L $\geq$ 9000	28 (8)	1 (0.3)	8 (2.3)	5 (1.4)
Total	210	46	62	33

Source: Own survey data.

6. VARIABLES PROXYING FOR FIRST-BEST RISK AND MATCHING FRICTIONS

The next step in the analysis is to determine which variables possibly affect risk, which of those variables are related to first-best risk and which of them are related to matching frictions. Hence, referring to Eq. (7) above, we need to determine a vector of variables X (first-best) and f (matching frictions).

6.1. Matching Frictions (f)

Sadoulet and Carpenter (2001) argue that variables proxying for matching frictions include indicators of the degree of asymmetric information among different members of a group, proxies for the ability to monitor and screen the activities of the different members in a group, and variables on the available borrowing options. From our data set we select the following list of variables related to monitoring, screening and the possibility to obtain credit:

1. *BORN*: a dummy variable with a 1 if the borrower is born in the village, 0 otherwise.
2. *KNOW*: a dummy variable with a 1 if the borrower knew the members well before meeting them in the group, 0 otherwise.
3. *INTEG*: a dummy variable with a 1 if the borrower knew about the behavioural integrity of all current group members before the formation of the group, 0 otherwise.
4. *ACTIV*: a dummy variable with a 1 if the borrower knows what the (daily) economic activities of the other group members are, 0 otherwise.
5. *PURP*: a dummy variable with a 1 if the borrower knows for what purpose the other group members acquired their last loans.
6. *SEL*: a dummy variable with a 1 if the borrower approximately knows the weekly sales of the other group members, 0 otherwise.
7. *NUMBER*: the number of members of the group.
8. *LDIST*: the logarithm of the average distance of the business of the borrower from that of the other group members.
9. *VISIT:* a dummy variable with a 1 if the members visit each other regularly, 0 otherwise.
10. *PROBLEM:* a dummy with a 1 if the borrower has had problems in repaying a debt before, 0 otherwise.
11. *OTHER*: a dummy with a 1 if the borrower has other sources of credit, 0 otherwise.

12. *ACORD:* a dummy variable with a 1 if the group belongs to the SZSCS (ACORD) system, 0 otherwise.
13. *CHANGE*: a dummy variable with a 1 if the borrower has participated before in another group, 0 otherwise.

From this list of variables, *BORN*, *KNOW, INTEG, ACTIV, PURP* and *SEL* primarily refer to social ties and the amount of information members have about each other. Some of these variables deal, in particular, with the information available before forming the group (especially *KNOW* and *INTEG*, and to some extent *BORN*); others refer to information that became available after the group was formed (*ACTIV, PURP* and *SEL*). An increase in value of one of these indicators implies more information about each other and probably stronger social ties. *NUMBER, LDIST* and *VISIT* have to do with the (possibility of) monitoring and screening each other's activities. More visits among members, and a lower distance between members probably increase screening possibilities. More group members tend to increase monitoring efforts, but there is also more scope for free riding. *PROBLEM* and *OTHER* refer to possibilities to obtain credit from other sources. *OTHER* directly measures whether a borrower has been able to raise funds from sources other than the micro-finance institution. *PROBLEM* measures repayment problems in the past and may give an indication of future possibilities to raise credit. *ACORD* and *CHANGE* are not directly related to the issues mentioned so far, but, as will become clear later, they have been included since they are highly correlated with one of the other indicators from this list.

6.2. First-Best Risk (X)

We assume that *first-best* risk can be picked up by variables that are directly related to the socio-economic situation of the borrower. We consider the following variables:

14. *LINC:* the logarithm of total monthly income.
15. *AGE*: the age of a borrower.
16. *GENDER:* a dummy with a 1 for a male, and a 0 for a woman.
17. *ILLIT:* a dummy with a 1 if the borrower is illiterate, 0 otherwise.
18. *PRIM*: a dummy with a 1 if the borrower has primary education, 0 otherwise.
19. *SEC*: a dummy with a 1 if the borrower has secondary education, 0 otherwise.

20. *LEADER*: a dummy with a 1 if the borrower is a group leader, 0 otherwise.
21. *MUSLIM*: a dummy with a 1 if the borrower is a Muslim, 0 otherwise.

Table 4 provides information on the 0/1 dummies. The table shows that about half of the borrowers still live in the village where they were born. A substantial number of the borrowers knew each other before forming the group. Also, most borrowers have some knowledge about the activities of the other members of the group. Nevertheless, there is only a small fraction of the total group of borrowers that knows the approximate weekly sales of other borrowers. About 28% of the borrowers admitted to having had repayment problems. Only 18 borrowers reported that they have other sources of credit, in addition to the micro-credits. Moreover, almost nobody ever applied for a bank credit (only 14 borrowers did). For six of them, the bank refused a loan (the latter information is not given in the table). The total sample consists of 351 borrowers, of which 167 are borrowers from SZSCS and 184 from SMCP. In Eritrea there are six zones. The data come from four zones. In two zones Eritrea only recently started to set up micro-finance groups. The SZSCS only operates in the southern zone, the SMCP all over the country.

Table 4. Variables Explaining Risk: 0/1 dummies.

	No. of Observations with 1	Total No. of Observations
BORN	179	351
KNOW	287	351
INTEG	290	351
ACTIV	307	351
PURP	333	351
SEL	19	351
VISIT	265	351
PROBLEM	60	351
OTHER	18	351
ACORD	167	351
CHANGE	35	351
ILLIT	111	351
PRIM	128	351
SEC	19	351
LEADER	102	351
MUSLIM	70	351
GENDER	155	351

Note: See Table 2.

Table 5. Other Variables Explaining Risk.

	INC	AGE	DIST	NUMBER
Mean	1,017	46	499	4
Median	1,000	45	200	4
Maximum	13,000	77	5,000	8
Minimum	300	18	5	3
Std. Dev.	752	11.67	863	1.32
Skewness	11.661	0.002	3.52	0.66
Kurtosis	185.24	2.65	17.01	2.80
Jarque-Bera	493,661	1.76	3,595	23.87
Observations	351	351	351	325

Note: See Table 2.

The majority of the respondents are illiterate or have only reading and writing abilities: 32% of the respondents are illiterate and 36% have only primary school education. Secondary graduates include only 5% of the data. About 20% of the respondents are Muslim, the rest are Christian. There are 155 women and 196 men in the data set. Table 5 provides data on the remaining independent variables.

The table shows that the average borrower is 46 years old, with an average monthly income (*INC*) of 1,017 Nakfas. Trading is the main occupation of the majority of the borrowers (63%), followed by farming (17%). The remainder is distributed between service providers, daily labourers and others. Often borrowers have different occupations at the same time, for instance, food vending and a traditional restaurant. The borrowers sell articles ranging from food items to clothing and provide services such as the provision of hot meals, pubs, local beverages and teashops (the latter information is not in the table). The number of members per group varies between three andeight, with an average offour. In the median group, 60% are women. The average distance between group members' businesses is about 500 metres.

6.3. Regrouping of the Variables

The concepts matching frictions and first-best risk are latent variables, which are not directly observable. Above, we have selected a group of variables that are assumed to be related to matching frictions and a group of variables that are assumed to be related to first-best risk. In order to better account for the high collinearity between some of the variables within the two groups and in order to test whether we can reduce the number of independent variables by constructing a smaller number of new composite variables, we performed a multiple factor analysis (MFA).

We started by applying a factor analysis on the indicators of the group of variables related to matching frictions. The analysis suggests that 11 indicators in this group can be decomposed into three underlying factors. The two remaining indicators (*PROBLEM* and *OTHER*) are left out of this analysis since they have very low factor loadings, even if more underlying factors are allowed for. The factor loadings of the analysis are given in Table 6.

The first factor mainly has to do with *KNOW* and *INTEG*, suggesting that the underlying factor in this case relates to information members have about each other before forming a group. *ACORD* and *NUMBER* mainly determine the second factor. *NUMBER* has a negative factor loading, which suggests that, with respect to our sample, the average number of members in credit groups from the ACORD (SCSZS) system is lower than that from the

Table 6. Factor Loadings for Factor Analysis on Matching Frictions Variables.

	FACTOR1	*FACTOR2*	*FACTOR3*
ACORD	–0.146	0.916	0.129
BORN	0.275	–0.227	–0.021
CHANGE	0.018	0.236	–0.019
KNOW	0.923	0.038	0.208
INTEG	0.935	0.050	0.202
LDIST	–0.176		–0.025
ACTIV	0.226	–0.093	0.376
PURP	0.058	0.120	0.733
SEL	0.102	0.185	0.048
VISIT	0.152	0.323	0.306
NUMBER	0.077	–0.632	0.019

Note: Chi-square statistic = 24.7; Df = 25; p-value = 0.479; CUMVAR = 0.394. Factor loadings smaller than 0.01 are not reported. Df denotes the degrees of freedom. CUMVAR gives the cumulative variance explained by the factors taken into account. The factor analysis is done on 323 observations (the common sample of all indicators. Observations refer to groups of both micro-finance institutions). The Chi-square statistic is a test of the hypothesis that three factors are sufficient versus the alternative that more are required. p-Value is the probability of being wrong when the null hypothesis is rejected (the plausibility of the null hypothesis. So, the smaller the p-value, the less plausible is the null hypothesis). See the appendix for a list of variables.

SMCP micro-finance system. A closer look at the data set confirms this: the average number of members in credit groups from the SMCP is 5.2, whereas it equals 3.6 for the ACORD (SCSZS) system. The positive factor loading on *VISIT* suggests that members of credit groups from the ACORD system visit each other more regularly than those of the SMCP system. The third factor mainly has to do with *PURP* and to a lower extent with *ACTIV*. This gives the impression that, in this case, the underlying factor relates to information members have about each other's businesses, after the group has been formed.

In the remainder of the analysis we will use the three factors, instead of the 11 original indicators. We interpret *FACTOR1* and *FACTOR3* as factors that primarily have to do with the asymmetry of information among group members. *FACTOR1* picks up information before forming the group, *FACTOR3* picks up information after the group has been formed. *FACTOR2* primarily relates to being a member of a credit group within the ACORD micro-finance system and the number of members within a group. The latter variable is important for risk taking since it gives information on a possible peer monitoring effort. Armendariz de Aghion (1999, proposition 3, p. 95) states that

> A larger group size tends to increase peer monitoring effort, due to a joint-responsibility, a cost-sharing, and a commitment effect. However… a larger group size (also) increases the scope for free riding in debt-repayment decisions.[5]

We also tried a factor analysis on the indicators for first-best risk. However, here the factor analysis showed that it is not possible to combine the indicators into a smaller group of underlying factors. The number of factors that has to be taken into account to accept the null hypothesis of enough factors is almost equal to the original number of indicators. Therefore, we decided to proceed with the individual first-best indicators in the remainder of the analysis.

7. ESTIMATING RISK

The next step in the analysis is to examine the possible empirical relevance of our matching frictions and first-best risk variables for explaining risk of a borrower's liquidity strategy. In other words, the next step is the estimation of Eq. (7).

The dependent variable is the proxy for risk, *r*, which we have constructed. The independent variables are the eight first-best risk indicators, the three factors related to matching frictions and the remaining two variables *PROBLEM* and *OTHER,* which are also related to matching frictions. To examine non-linear effects we also tried quadratic terms, but, except for the quadratic term of *LINC* (*LINC2*), none of them appeared to be significant and hence were left out of the analysis.

The constructed dependent variable is censored between 0 and 1. Therefore, we estimate with the TOBIT estimation technique with left and right censoring (using NORMAL distribution of error terms). We also present ordinary least squares (OLS) estimates to test for differences in outcome due to different estimation techniques. The estimation results are presented in Table 7.

Columns (1A) and (1B) show that *LINC, LINC2, LEADER, SEC, PROBLEM* and *FACTOR2* significantly affect risk behaviour. Since *LINC* has a significantly negative coefficient and *LINC2* a significantly positive coefficient, there seems to be a non-linear relationship between the income of a borrower and his or her risk behaviour. For low income levels, an increase in income lowers risk, whereas it increases risk after a certain threshold level of income has been passed. Positive significant coefficients for *LEADER, SEC* and *PROBLEM* suggest that a group leader takes more risks than a normal group member, that members who are more educated take more risks and that members who have had payment problems in the past also take more risks. The negative coefficient for *ACORD* implies that borrowers in a borrowing group belonging to the ACORD system take fewer risks. The underlying reason probably is that the number of members in credit groups belonging to the ACORD system is lower. Larger groups may lead to more risk taking of the individual members, possibly due to a better scope for free riding. These results hold for both the OLS and TOBIT estimates.

In columns 2A and 2B the regressions are repeated by ignoring the insignificant terms. These regressions confirm the results suggested by columns 1A and 1B. Finally, we re-estimate the equations by replacing *PROBLEM* by *APROBCRED* (columns 3A and 3B). *APROBCRED* measures the amount of money that was involved when the borrower had problems repaying the debt, as a percentage of the size of the loan in the previous loan cycle. This indicator serves as an alternative indicator for *PROBLEM*. The results of these regressions again confirm the basic message of columns 1A and 1B.

Since *FACTOR2* mainly has to do with three indicators, *ACORD, VISIT* and *NUMBER,* we also perform OLS and TOBIT regressions in which *FACTOR2* is replaced by one of these individual indicators. The regression

Table 7. Estimating Risk.

	1A	1B	2A	2B	3A	3B
	Method					
	OLS	**TOBIT**	**OLS**	**TOBIT**	**OLS**	**TOBIT**
LINC	–0.866	–1.224	–0.880	–1.260	–0.487	–0.790
	(–2.93)	(–3.48)	(–3.05)	(–3.63)	(–2.19)	(–2.77)
LINC2	0.055	0.078	0.056	0.080	0.029	0.048
	(2.73)	(3.31)	(2.86)	(3.48)	(1.93)	(2.51_
AGE	0.0002	0.0003				
	(0.22)	(0.21)				
GENDER	–0.016	–0.029				
	(–0.63)	(–0.84)				
ILLIT	–0.029	–0.037				
	(–0.96)	(–0.91)				
PRIM	0.004	0.0020				
	(0.16)	(0.06)				
SEC	0.111	0.149	0.116	0.157	0.116	0.148
	(2.40)	(2.39)	(2.78)	(2.72)	(2.85)	(2.59)
LEADER	0.0585	0.073	0.060	0.074	0.042	0.049
	(2.70)	(2.46)	(3.00)	(2.62)	(2.25)	(1.91)
MOSLIM	0.012	0.019				
	(0.40)	(0.47)				
PROBLEM	0.320	0.386	0.321	0.386		
	(8.35)	(8.38)	(8.53)	(8.47)		
APROBCRED					0.399	0.540
					(6.72)	(7.61)
OTHER	0.0028	–0.0049				
	(0.06)	(–0.08)				
FACTOR1	–0.00076	0.0078				
	(–0.07)	(0.50)				
FACTOR2	–0.022	–0.049	–0.022	–0.050	–0.016	–0.037
	(–2.07)	(–3.16)	(–2.13)	(–3.25)	(–1.73)	(–2.74)
FACTOR3	–0.006	–0.011				
	(–0.47)	(–0.68)				
CONSTANT	3.443	4.734	3.480	4.846	2.092	3.188
	(3.18)	(3.64)	(3.28)	(3.78)	(2.54)	(3.03)
Adj. R^2	0.39	0.40	0.40	0.41	0.49	0.53

Note: The number of observations is 323 for all regressions. *t*-Values (*z*-values for TOBIT) based on White Heteroskedasticity-Consistent Standard Errors (for the OLS regressions) and QML (Huber/White) standard errors between parantheses. The TOBIT estimates are done with left (0) and right (1) censoring; there are 94 left censured observations and 10 right censured observations. See the appendix for a list of variables.

results show that each of these individual terms, with the exception of the OLS estimate for *NUMBER*, is significant. Being a borrower from a credit group associated with the ACORD system has a negative effect on risk taking. The same holds for more visits among members of a credit group. An increase in the number of members of a credit group enhances the risk-taking behaviour of an individual borrower. The results are presented in Table 8.

We are now able to come up with estimates of $\overline{r_i^*} = X_i\bar{\alpha}$ and $\overline{\beta f}_i = f_i\beta$ (Eqs. (8) and (9), Section 4). For this we use the estimation results of column 2B (the TOBIT estimates) presented in Table 7. As we have explained before, we argue that the variables that are related to the socio-economic situation (i.e. *LINC, LINC2, SEC* and *LEADER*) determine the risk choice in a frictionless world. The other variables (*PROBLEM* and *FACTOR2)* are primarily related to matching frictions. By using the estimated

Table 8. Estimating Risk, Replacing *FACTOR2* by *ACCORD, VISIT* and *NUMBER*.

	1A	1B	2A	2B	3A	3B
	Method					
	OLS	TOBIT	OLS	TOBIT	OLS	TOBIT
LINC	–0.833	–1.179	–0.800	–1.074	–0.840	–1.166
	(–2.95)	(–3.49)	(–2.87)	(–3.25)	(–2.89)	(–3.35)
LINC2	0.053	0.076	0.051	0.068	0.053	0.074
	(2.77)	(3.35)	(2.68)	(3.07)	(2.69)	(3.18)
SEC	0.085	0.114	0.078	0.092	0.109	0.139
	(2.25)	(2.04)	(2.12)	(1.70)	(2.64)	(2.47)
LEADER	0.060	0.075	0.057	0.071	0.060	0.074
	(3.10)	(2.74)	(3.02)	(2.65)	(3.00)	(2.64)
PROBLEM	0.324	0.392	0.316	0.373	0.318	0.379
	(8.74)	(8.73)	(8.66)	(8.54)	(8.50)	(8.39)
ACORD	–0.042	–0.097				
	(–2.31)	(–3.48)				
VISIT			–0.049	–0.076		
			(–2.37)	(–2.79)		
NUMBER					0.010	0.023
					(1.43)	(2.40)
CONSTANT	3.310	4.578	3.224	4.246	3.301	4.422
	(3.21)	(3.68)	(3.17)	(3.48)	(3.08)	(3.43)
Adj. R^2	0.39	0.41	0.39	0.41	0.39	0.41

Note: See note for Table 7. See the appendix for a list of variables.

coefficient of column 2B (Table 7) we can now come up with estimates of $\overline{r_i^*}$, which we name *FIRSTBEST,* and $\overline{\beta f_i}$, which we name *FRICTION*.[6]

8. HETEROGENEITY

The final step in the analysis is to estimate the heterogeneity equation (Eq. (10), Section 4). For this we first need to develop a measure of risk heterogeneity.

8.1. The Measure for Risk Heterogeneity

In line with Sadoulet and Carpenter (2001) we measure risk heterogeneity (h_i) as

$$h_i = \left[\sum_{r_j \in G_i} \frac{(r_i - r_j)^2}{(N_i - 1)} \right]^{0.5} sign(r_i - \overline{r_i})$$

where $\overline{r_i}$ is the mean risk in i's group G_i.

This proxy measures the average Euclidean distance between the risk of borrowers and all their group partners. Note that our measure for heterogeneity is individual rather than group specific, as it should be (see explanation in Section 4). Moreover, the heterogeneity proxy gives higher degrees of heterogeneity for borrowers with a risk level that is further away from the mean risk level in the group. This is also in line with theory. We sign the average Euclidean distance in order to allow for possible differences in behaviour for the relative safe and relative risky borrowers in a group (in line with theories that examine group formation in the context of missing insurance markets; see Section 3). However, we also used a measure for heterogeneity that is not adjusted for having a risk above or below the mean risk. Qualitatively, this led to the same results. For lack of space, we have not presented these results. Table 9 gives the descriptive statistics of h.

It appears that heterogeneity in almost all cases differs from zero. This seems to imply that we have to reject the hypothesis of homogeneous matching, since with homogeneous matching the risk heterogeneity within groups should be equal to zero. However, it may be the case that this heterogeneity is caused by matching frictions, an issue we will examine by estimating Eq. (7).

Table 9. Heterogeneity.

	h
Mean	–0.005
Median	–2.78E–17
Maximum	1.00
Minimum	–1.00
Std. Dev.	0.265
Skewness	0.115
Kurtosis	5.227
Jarque-Bera	72.65

Note: See the appendix for a list of variables.

Table 10. Estimating Heterogeneity.

	1	2
	METHOD	
	TOBIT	OLS
FIRSTBEST ($\bar{r}_i^*$)	0.663	0.660
	(3.20)	(3.19)
FRICTION ($\overline{\beta f}_i$)	0.623	0.620
	(5.54)	(5.52)
CONSTANT	3.129	3.115
	(3.13)	(3.13)
Adj. R^2	0.15	0.16

Note: The number of observations is 323 for all regressions. t-Values (z-values) for OLS (for TOBIT) between parantheses (based on White Heteroskedasticity-Consistent Standard Errors and Covariances and Huber/White robust standard errors & covariances, respectively). In Eq. (1) there is one right and one left censored observation. See the appendix for a list of variables.

8.2. Estimation Results

The estimates of the heterogeneity equation are presented in Table 10.[7] Again we use the OLS as well as the TOBIT estimation technique. The dependent variable in the regressions is our proxy for heterogeneity (h). It appears that the coefficient for *FIRSTBEST* is significantly different from zero at the 99% level, strongly suggesting that homogeneous matching will not take place, even if the estimates are controlled for matching frictions.

A possible caveat of our analysis might be that we have not included all relevant variables in the equation for risk (Eq. (7)) and that this affects our estimates of Eq. (10). Possibly, there are some relevant matching frictions, or first-best variables missing. This is, e.g. suggested by the fact that there are only a few variables for matching frictions significant in Eq. (7). This may then lead to omitted variable bias. The problem with omitted variable bias is that it may lead to a correlation between the disturbance term and one of the right-hand side variables. This may bias the estimates of the coefficient and standard error of X_i and f_i in Eq. (7), and consequently affect our estimates of the heterogeneity equation. However, note that we are not directly interested in the parameters in Eq. (7). We only use the fitted variables for first-best risk and matching frictions. It is easy to show that the predicted values are consistent estimators, so that we can be reasonably convinced that our result with respect to *FIRSTBEST,* and hence our conclusion that homogeneous matching does not hold, is not affected by omitted variable bias because of a mis-specification of the risk equation. Our approach of obtaining *FIRSTBEST* and *FRICTION* is somewhat comparable to an instrumental variable (IV) technique. As is well known IV estimation is designed to overcome problems caused by correlation between the disturbance term and the right-hand side variables.

9. CONCLUSIONS

We conducted a survey in 2001 among members and group leaders of borrowers who accessed loans from two micro-credit programmes in Eritrea. Using the results from this survey, this paper aims to provide new insights on the empirical relevance of the homogeneous matching hypothesis for micro-credit groups in Eritrea. A clearer insight into how groups are formed and whether these groups are homogeneous is extremely important for our understanding of the working of micro-credit programmes. The result of our analysis can be used as input, or as an intermediate result, for a comparative analysis of repayment performance of joint liability schemes versus individual liability debt contracts.

An important part of the methodology to test for homogeneous matching consists of estimating risk behaviour of borrowers from micro-credit institutions. Before summarising these results it should be noted that these results cannot be generalised since the behaviour of borrowers with certain characteristics may differ from those who borrow or do not borrow from a micro-finance institution. This is because of a possible selection bias due to the fact that micro-finance institutions are targeted at a particular part of the population (the poor).

The estimates with respect to risk behaviour suggest that among the borrowers from the micro-finance programmes in Eritrea, there is a non-linear relationship between income and risk taking. Below a certain threshold level of income, an increase in income will lead to less risk taking, whereas an increase in income will increase risk taking above a certain level of income. We also find that group leaders take more risks than normal group members, that better educated borrowers take more risks and that borrowers who have had payment problems in the past will take greater risks. Moreover, we find some evidence that borrowers in larger groups will take more risks than borrowers in smaller groups.

Concerning the homogeneous matching hypothesis, our results strongly indicate that groups are formed heterogeneously. More importantly, we do not find support for the matching frictions hypothesis, in the sense that even if we control matching frictions, credit groups in Eritrea do not seem to consist of borrowers of the similar risk type. The implication of this finding for repayment behaviour is not clear. However, our result seems to be bad news for those who argue that group lending may reduce problems of adverse selection. In some theoretical papers, it has been argued that incentive-compatible separating equilibria will result if a lender offers different types of debt contracts, with varying components for joint liability. By choosing a particular debt contract, the borrower will signal its type and hence the asymmetric information and, consequently, the adverse selection problem will be solved. However, this result is based on the homogeneous matching hypothesis.

Of course, some reservations with respect to our main conclusions can be made. For instance, the classification of variables into a group that primarily deals with matching frictions and a group of variables dealing with first-best risk determinants may be criticised. In addition, our variables *FIRST-BEST* and *FRICTION* are constructed variables and, therefore, are measured with error. This may bias the estimates of the coefficients. Moreover, the measure of risk we use may not be the most accurate measure for risk taking. There may be other measures of risk that are better proxies. It may then be the case that using another measure for risk will lead to homogeneous matching, instead of the heterogeneous matching we found by using our measure for risk. More research on these issues is needed. Nevertheless, given the data we have, and taking into account all possible drawbacks of the methodology used, we think that our analysis, at the least, suggests that the assumption commonly held on homogeneous matching cannot be confirmed in the case of Eritrea. If one accepts that groups are formed heterogeneously, an important issue is then to examine why this is so.

A possible reason brought forward in some recent papers is the insurance that risky and safe borrowers may provide. The models behind the homogeneous matching hypothesis assume that borrowers are risk neutral and that project returns do not co-vary. This implies that in these models there is no possibility of gaining from economies of risk pooling. However, if borrowers are risk averse and project returns are not independent, then a borrower may gain by grouping with another borrower if the project returns of the two borrowers are negatively correlated. This may then imply that heterogeneous matching is the optimal outcome.

NOTES

1. See Armendariz de Aghion and Morduch (2000) for micro-finance practices beyond group lending.
2. Detailed information on the questionnaire can be obtained on request.
3. In fact f refers to a matrix of variables determining the friction level f_i
4. Note that Sadoulet and Carpenter use the sum of expected sales in the last 3 days before the due date as the scaling factor, instead of P_i. Our questionnaire also contains a question on the expected sales in the last days (week in our case) before the due date. However, since the answers to this question were totally unreliable we decided to scale by P_i .
5. Note that in Armendariz de Aghion (1999) groups are exogenously given. In practice, there is a trade-off between group size (monitoring effort) and benefits of size (diversifation, easier to cover one defaulting partner). Group size is thus endogenous. We ignore this problem in our analysis.
6. We assume that the conditional mean ($E[y_i]$) of the TOBIT regression equation $y_i = \beta x_i + \varepsilon_i$ equals $K_i\ x_i$. If all independent variables are taken into account, this forecasts the so-called expected *latent variable.*
7. It should be noted that the variables *FIRSTBEST* and *FRICTIONS* are measured with errors. OLS (and TOBIT) estimates of the heterogeneity equation may therefore be biased. A possible solution, used by Sadoulet and Carpenter (2001) is to estimate the heterogeneity equation with instrumental variables. However, due to a lack of candidates for instruments in our sample, we decided to rely on the OLS estimates.

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APPENDIX: LIST OF VARIABLES

ACTIV: a dummy variable with a 1 if the borrower knows what the (daily) economic activities of the other group members are, 0 otherwise.

ACORD: a dummy variable with a 1 if the group belongs to the SZSCS *(ACORD)* system, 0 otherwise.

AGE: the age of a borrower.

BORN: a dummy variable with a 1 if the borrower is born in the village, 0 otherwise.

CHANGE: a dummy variable with a 1 if the borrower has participated before in another group, 0 otherwise.

DIST: the average distance (in metres) of the business of the borrower from that of the other group members.
h: the measure for risk heterogeneity. Measured as

$$h_i = \left[\sum_{r_j \in G_i} \frac{(r_i - r_j)^2}{(N_i - 1)} \right]^{0.5} sign(r_i - \overline{r_i})$$

GENDER: a dummy with a 1 for a male and a 0 for a woman.
ILLIT: a dummy with a 1 if the borrower is illiterate, 0 otherwise.
INTEG: a dummy variable with a 1 if the borrower knew about the behavioural integrity of all current group members before the formation of the group, 0 otherwise.
LDIST: the logarithm of the average distance of the business of the borrower from that of the other group members.
KNOW: a dummy variable with a 1 if the borrower knew the members well before meeting them in the group, 0 otherwise.
LEADER: a dummy with a 1 if the borrower is a group leader, 0 otherwise.
MUSLIM: a dummy with a 1 if the borrower is a Muslim, 0 otherwise.
LINC: the logarithm of total monthly income.
NUMBER: the number of members in the group.
OTHER: a dummy with a 1 if the borrower has other sources of credit, 0 otherwise.
P : loan payment due per month.
PRIM: a dummy with a 1 if the borrower has primary education, 0 otherwise.
PROBLEM: a dummy with a 1 if the borrower has had problems in repaying debt before, 0 otherwise.
PURP: a dummy variable with a 1 if the borrower knows for what purpose the other group members acquired their last loans.
r: the risk measure, calculated as $r_i = \frac{P_i - S_i}{P_i}$ for $P_i \geq S_i$ and $r_i = 0$ for $P_i < S_i$.
S: the amount the borrower reported having saved 1 week before the due data.
SEC: a dummy with a 1 if the borrower has secondary education, 0 otherwise.
SEL: a dummy variable with a 1 if the borrower approximately knows the weekly sales of the other group members, 0 otherwise.

VISIT: a dummy variable with a 1 if the members visit each other regularly, 0 otherwise.

Source: Unless stated otherwise, all variables are obtained via a survey (personal interviews) in 2001 among members and groupleaders of credit groups in Eritrea. The survey was done in four of the six zones of Eritrea and contain credit information from the two micro-finance institutions in Eritrea (the SMCP and the SZCS).

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IMPACT OF INVESTMENT IN INFORMATION TECHNOLOGY ON BANK PRODUCTIVITY AND PROFITABILITY: EVIDENCE FROM JORDAN

Ahmad Mashal

ABSTRACT

There has been much debate on whether or not investment in information technology (IT) yields improvements in productivity and business profitability. Recent studies on banks have shown that there are substantial high returns to increases in investment in IT labor while investment in IT capital may have no real benefits. This study investigates the effect of IT investment on productivity and profitability using data for 1985–2004 for Arab Bank, which is one of the leading Jordanian banks. The results indicate that there are substantial returns to investment in IT capital, and that there should be an incentive for bank mangers to shift emphasis in IT investment from labor to capital.

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1. INTRODUCTION

There is much debate on whether or not the investment in information technology (IT) provides improvements in productivity and business profitability. Scholars and policymakers have contributed differing insights into the issue, which has led to the coining of the term "IT productivity paradox." Morrison and Berndt (1990) conclude that additional IT investments contributed negatively to productivity. They argue that "estimated marginal benefits of investment in IT are less than the estimated marginal costs." For example, for each additional dollar spent on IT, the marginal increase in measured output was only 60 cents.

This paper considers the effects of IT on productivity and profitability in one of the leading Jordanian banks. For this study, data on IT spending were collected through bank annual reports and fieldwork conducted as part of a major study of the bank.

2. PREVIOUS RESEARCH

Several studies over the years have been conducted at both the industry and firm levels to examine the impact of IT on productivity. Some studies have drawn on statistical correlation between IT spending and performance measures such as profitability or stock value.

Loveman (1994) concludes that for the manufacturing firms included in his study there is no significant contribution to output from IT expenditure. Parsons, Gotlieb, and Denny (1993) conclude from their estimation of data from five Canadian banks using a translog production function that while there is a 17–23% increase in productivity with the use of computer, the returns are very modest compared to the levels of investment in IT. Dos Santos, Petters, and Maur (1993) and Strassman (1990) point out that there is insignificant correlation between IT spending and profitability measures. On the other hand, Lichtenberg (1995) and Hitt and Brynjolfsson (1996) (having worked with firm-level data) have found significant contributions from IT toward productivity. Lichtenberg (1995) concludes that there are substantial excess returns to investment in computer capital and that one information systems (IS) employee is equivalent to six non-IS employees in terms of marginal productivity. While Hitt and Brynjolfsson (1996) conclude that computers contribute significantly to firm-level output, computer capital contributes an 81% marginal increase in output and non-IT capital contributes only 6%. These figures show that IS labor is more than twice as paradoxical as non-IS labor. Nicolas (2003) states that IT capital accounts for 23–39% of the growth of labor productivity over 1989–1998. There seems general agreement that a large part of the increase in U.S. labor productivity that occurred in the second half of the 1990s can be accounted for by IT investment (Bassanini et al., 2000). Triplett and Bosworth(2000), Gordon (2000), Jorgenson and Stiroh (2000), and Oliner and Sichel (2002) confirm that investment in IT in turn was driven by the rapid rate of decline of computer prices in the same period (see also Tevlin & Whelan 2000). The fall in computer prices has been mainly due to rapid and accelerated technical progress in semiconductors (Jorgenson, 2001; Jorgenson & Stiroh, 2000; Oliner & Sichel, 2000).

Most studies relating to the contribution of IT toward firm-level productivity have been restricted to the manufacturing industry, possibly owing both to lack of data at the firm level in the service industry and perhaps, more significantly, the difficulty of unambiguously identifying the "output" of a service industry. The later problem is particularly persistent in the banking industry, which is the focus of this study.

The paradox of IT impact on productivity and profitability can be partially interpreted as a result of insufficient and incomplete use of IT elements – that is, IT capital and IS labor. In addition, database analysis, whether on the short run or on the long run and whether on firm or industry levels, have also contributed to the variation in the conclusions of the studies mentioned above. Yet none of those typical studies, to the best of our knowledge, was conducted in developing countries. This gives our study further justification.

One theory of production economics indicates that on the long run the average total cost has an inverse relation with technological progress, which implies a positive relation between productivity and technology. However, the impact of technological progress on productivity can be fully realized in developed countries and to a lesser extent in developing countries. That would implicitly assume an optimum utilization of available resources, including technology adoption in the production processes, which is highly likely to take place in developed countries and much less in developing countries. However, this is not always the case, as noted above.

3. RESEARCH PROBLEM AND OBJECTIVES

Inefficient and incomplete use of IS labor and IT capital available at the banking firms of Jordan may have contributed to the widening of the gap between the interest paid and interest received by those firms. Such a phenomenon can be a good justification for exploring the impact of IT capital and IS labor on productivity and profitability in the case under consideration. In addition, the financial services industry has been and will be a major user of IT and, significantly, it is an industry that can easily take advantage of IT.

Due to the impact of IT on the efficiency, security, and risks of the financial system, this paper focuses on the following objectives of efficiency indexes:

(a) Determining the measurements of productivity and profitability for a bank.
(b) Exploring the nature of the relationship between IT investment and IS labor expenses as well as the level of productivity and profitability in Arab Bank.
(c) Examining the contribution of IT capital and IS labor expenses toward productivity and profitability in Arab Bank.

4. ARAB BANK PROFILE

Arab Bank Plc. is owned by approximately 3,300 shareholders from all Arab countries. It was established in 1930 with a paid-up capital equal to US$ 75,000. By the end of December 2004, the Group's equity was more than US$ 3,250 million, and with total assets equal to US$ 27.3 billion.

Currently, Arab Bank Group has a worldwide and diversified network of more than 400 branches. Arab Bank Plc. is one of the principal financial institutions in the Arab world and ranks among the leading international banks in terms of equity, earnings, and assets. It is engaged in providing a wide variety of financial services to individuals, corporate and institutional customers, government agencies, and other international financial institutions. These services include retail banking, private banking, trade financing, merchant banking, commercial real estate lending, and international banking.

Arab Bank Group employs a prudent asset management policy that is centered on selecting a prime loan portfolio and, at the same time, maintaining high liquidity. On December 31, 2004, the liquidity ratio (cash and quasi-cash to total assets) amounted to 53%.

By the end of December 2004, Arab Bank Group's equity amounted to 12% of total assets. The capital adequacy ratio for the Group, measured according to the Basle committee rule, was around 21%. Moreover, the total equity corresponded to more than 28% of the loan portfolio, placing the bank in a very sound financial position.

Most of the Group's external sources of funds are composed of stable customer deposits, which give the Group ample room to manage its assets efficiently and reflect customers' longstanding confidence and loyalty. Total deposits at the end of December 2004 reached US$ 19.3 billion.

In the past 30 years, Arab Bank has established a major in-house automation department that has introduced a range of new systems, including one-stop teller service, automated teller machines, automated letters of credit, transfers and drafts issuance, decentralized payments of incoming transfers at any branch, advanced foreign exchange dealing system, inter-branch banking allowing a customer to cash a check at any branch, a point of sale system, corporate and home banking via computer links, a phone banking service, a global high-speed data communication network, optics-based electronic filing and signature verification systems, a global communications network, membership in several international inter-bank payment systems, and a globally coordinated money market management system that brings together the bank's dealing rooms in Amman, London, Singapore, New York, Manama, Paris, and Sydney.

5. METHODOLOGY

5.1. The Model

In the absence of measures of actual benefits associated with IT, it is not possible to perform cost–benefit analyses of IT investment; thus, production functions that relate IT spending to overall productivity or output measures are seen as the best alternative (Parsons et al., 1993). Production function techniques have been shown to be valid and quite successful through hundreds of empirical studies. The chosen form of production function must meet with the conditions required by economic theory, such as monotonicity and quasi-concavity. The Cobb–Douglas function satisfies such conditions and has been used for about a 100 years, and used by most of the previously mentioned studies. Thus, our study models banks as operating according to this form, as shown below:

$$Log\ Q = B_0 + B_1 \log\ C + B_2 Log\ K + B_3\ Log\ S + B_4\ Log\ L + u \qquad (1)$$

where Q is the output of the firm, C is the IT capital, K is the non-IT capital, S is IS labor expenses, L is non-IS labor expenses, and B_1, B_2, B_3, and B_4 are the associated output elasticities. Different issues may be addressed with production function approaches, such as the impact of IT on productivity and profitability.

5.2. Hypotheses

The following hypotheses will be tested:

(a) Whether or not there is a significant relationship between IT on the one hand and productivity and profitability on the other.
(b) Whether or not IT investment makes a positive contribution to the productivity of banks.
(c) Whether or not IT investment makes a positive contribution to the profitability of banks.

To undertake analysis of the impact of IT on productivity and profitability, we employ the Cobb–Douglas production function as discussed above. The earlier hypotheses become:

H_1a. $B_1 > 0$, $B_3 > 0$, versus the null hypotheses that $B_1 = B_3 = 0$
The marginal product of IT capital and IS labor is positive, implying that investment in IT improves productivity or profitability.

H_1b. B_1 (output/IT capital) – cost of IT capital > 0
B_3 (output/IT labor) – cost of IT labor > 0
H_1b allows us to verify that the impact of IT investment is not just positive, but that it pays more than what we spend on it. This is a stronger test than H_1a, which only tests for the gross returns, since we want to estimate whether there are net returns (net returns = gross returns – cost) associated with IT.

To undertake analysis of the output of banks for a production function analysis, studies of productivity in the banking industry struggle with the issue of what constitutes the "output" of a bank. The various approaches researchers have chosen to evaluate the output of banks may be classified into three broad categories: the assets approach, the user-cost approach, and the value-added approach (Berger & Humphrey, 1992).

In this study, we use two measures of output for productivity and two for profitability. For the productivity analysis, we first use the sum of total loans and total deposits for output. Then, we repeat the analysis with net income of the bank as the output measure. For the profitability analysis, we employ two measures that banks commonly use as indicators of profitability: return on assets (ROA) and return on equity (ROE).

5.3. Data and Measurement

The data for this study were obtained from the Arab Bank annual reports during the period 1985–2004 and from fieldwork conducted as part of a major study of the bank. This project collected extensive data relating to operations management, human resources management, work practices, and a detailed survey of technology. We have designed questionnaires for the ''most informed respondent'' (Huber & Power, 1985) in the bank in a number of areas as mentioned above.

6. RESULTS

In this study, we tested the hypotheses mentioned before by using two measures of output for productivity and two for profitability.

6.1. Productivity Contribution of IT

As can be seen from the summary statistics in Table 1, the bank in our case has an average of \$14499.979 million in terms of loans and deposits and \$101.5466 million in terms of generated revenues. Table 1 also shows the average investment in IT and non-IT capital and labor.

We first consider a test of hypothesis, when *Output* = *Loans and Deposits*. Table 2 shows the statistical estimates of loans and deposits production function.

H_1a. $B_1 > 0$, $B_2 > 0$

We see that the coefficients associated with IT capital and IS labor are positive.

Table 1. Mean Values of the Dependent and Independent Variables.

Dependent Variable: Output Measures			
Avg. loans and deposits	Avg. revenues (net income)	Avg. ROA	Avg. ROE
\$14499.979 M	\$101.5466 M	1.21%	1.607%
Independent Variables (Inputs)			
Avg. IT capital	Avg. IS labor	Avg. non-IT capital	Avg. non-IS labor
\$14.985	\$87.15143 M	\$68.46 M	\$15.0914 M

Table 2. Regression Results When Output is Measured as Total Loans Plus Total Deposits.

	Parameter	Coefficient	*t*-Statistics	*t*-Statistic: Significance	Ratio to Output	Marginal Product
B_1	IT capital	6022	0.915	62%	0.001033	401.868
B_3	Non-IT capital	1531.884	0.603	54%	0.0047	22.3766
B_2	IS labor expenses	4004.695	1.027	68%	0.006	45.949
B_4	Non-IS labor expenses	−5504.586	−1.77	74%	0.00104	−364.749
	$R^2 = 0.96$					

However, a fairly good significance associated with both coefficients (B_1, B_2) implies that there are fairly low probabilities (38% and 32%, respectively) that both coefficients are zero. Thus, we are able to establish evidence to support Hypothesis H1a for IT capital and IS labor (i.e., that IT capital and IS labor produce positive returns in productivities). It is interesting to note that the coefficient of non-IS labor is definitely negative, implying that IS labor has relatively better return than in non-IS labor.

However, the results show that we cannot reject H1a for IT capital and IS labor, and since the marginal product of IT capital ($401.868) is greater than that of IS labor ($45.949), we can safely conclude that IT capital is associated with a higher increase in the output of the bank than that of with IS labor.

H_1b. From Table 2, we see that the marginal product for IT capital is very high ($401.868). Since every dollar of IT capital costs a dollar, the excess returns from IT capital can be computed to be ($401.686 – 1), or $400.868. Thus, H_1b cannot be rejected for IT capital.

We restricted our discussion on IT capital because IS labor is associated with negative marginal product as can be seen in Table 3.

For a test of hypothesis (when Output = Net Income), we consider the following:

H_1a. We see that the coefficients associated with both types of labor expenses (IS and non-IS labor) are negative, while these associated with IT capital variables are positive. This is perhaps reflective of the banking industry where the emphasis on computers implies that IT capital is a

Table 3. Regression Results When Output is Measured as Net Income of the Bank.

	Parameter	Coefficient	*t*-Statistics	*t*-Statistic: Significance	Ratio to Output	Marginal Product
B_1	IT capital	108.595	1.755	90%	0.14756	7.25
B_3	Non-IT capital	4.97	0.208	18%	0.6747	0.073
B_2	IS labor expenses	−1.492	−0.04	4%	0.858	−0.0172
B_4	Non-IS labor expenses	−65.324	−1.486	84%	0.1486	−4.3285
	$R^2 = 0.90$					

more worthwhile investment than that in IS labor. Given that the results imply negative productivity with investment in labor, we are forced to reject H_1a, and conclude that IS labor investment influences productivity negatively. H_1a again cannot be rejected for IT capital since the marginal product of IT capital is $7.25. Thus, IT capital, when analyzed with net income of the bank as the output measure, is associated with increase in the output of the bank.

H_1b. The rejection of hypothesis H1a for IS labor means that we can reject the stronger hypothesis H_1b for IS labor (there can be no "excess benefits" given that there are no benefits with IS-labor investment). For IT capital, we see that the marginal product is $7.25, i.e., with every dollar invested in IT capital, we see an increase in the output "net income" of $7.25. The excess returns from IT capital is $17.25 – 1 or $ 6.25; thus, H_1b cannot be rejected for IT capital.

6.2. Issues of multicollinearity

In the estimation of a Cobb–Douglas production function, it is usual to expect relatively high correlation between independent variables. In our case, there is the likelihood of high correlation between IT capital and IS labor investments. As Kennedy (1985) notes, "the existence of multicollinearity in a data set does not necessarily mean that the coefficient estimates in which the researcher is interested have unacceptably high variances. The classical example of this is the estimating of the Cobb–Douglas production function: The input of capital and labor are highly collinear, but none the less, good estimates are obtained." The t-statistics we obtain for IS labor imply that IS labor is not a significant variable in the regression, with its estimated coefficient tending to zero. That this result is not due to collinearity problems, but a result of the estimation, is borne out by the low correlation between IT capital and IS labor investments over the period of our data ($r = 0.273$).

In terms of the question of profitability contribution of IT capital and IS labor, we employ two measures that banks commonly use as indictors of profitability: ROA and ROE. To use the definition provided in the annual reports of the bank, ROA is "net income as a percentage of total assets, indicating how well the bank has used its assets," while ROE is "net income as a percentage of total share holders' equity … measuring how well a bank's equity has been employed." The key findings from the estimation are reported in Tables 4 and 5.

In general, we find that the t-statistics and marginal product from the analysis of the profitability measures are very low. The easy availability of IT to all banks implies that IT investments do not provide any competitive advantage. In other words, since there is no "barrier to entry" in terms of IT in the retail banking industry, a bank investing in IT does not stand to gain additional market share as a result of its investment. In fact, by not investing

Table 4. Regression Results when Output is Measured as Return on Assets.

Parameter	Coefficient	t-Statistics	t-Statistic: Significance	Marginal Product
B_1 IT capital	0.743	3.075	99%	0.04958
B_3 Non-IT capital	−0.07185	−0.77	55%	−0.001049
B_2 IS labor expenses	−0.321	−2.242	94%	−0.003683
B_4 Non-IS labor expenses	0.158	0.922	43%	0.010469
$R^2 = 0.65$				

Table 5. Regression Results When Output is Measured as Return on Equity.

Parameter	Coefficient	t-Statistics	t-Statistic: Significance	Marginal Product
B_1 IT capital	−14.422	−0.987	66%	−0.962
B_3 Non-IT capital	3.640	0.645	47%	0.05317
B_2 IS labor expenses	6.248	0.722	52%	0.0717
B_4 Non-IS labor expenses	0.446	0.043	4%	0.0295
$R^2 = 0.40$				

in IT and by foregoing the gains provided by it, a firm may, on the other hand, lose market share (Clemons, 1991). Thus, in this competitive environment of retail banking, neither IT capital nor IS labor investments should make significant impacts on the firm's profitability. The results bear the following conclusion out: IT investments have insignificant effect on bank profitability.

6.3. Discussion of Econometric Results

We see that IS labor makes zero, and even perhaps slightly negative, contribution to productivity. This result is in conformity with those obtained from previous studies in the manufacturing sector (Hitt & Brynjolfsson, 1996; Lichtenberg, 1995), and seems significantly different from those obtained in Parsons et al. (1993) and Prasad and Harker (1997). IT capital presents a different picture. Both with total loans and deposits and with net income as output measures, we see that IT capital contributes significantly to output. Its marginal product is at least 10 times as much as that of non-IT capital in both cases (loans and deposits and net income). It is interesting to compare the marginal product of IT capital as opposed to IS labor. It is worth noting that while IT capital contributes significantly to productivity increases, IS labor does not. Thus, these results state that while the bank in our study may have overinvested in IS labor (over staffed) with unqualified employees, there is significant benefit in rational hiring and increasing investment in IT capital.

7. CONCLUSION AND RECOMMENDATIONS

This paper shows the importance of IT capital in the overall productivity and profitability of the case under consideration, the Arab Bank. Also, it shows the insignificant impact of IS labor on the productivity and profitability of the bank. This can be explained by the ratio of investment in IS labor to IT capital (15.8%, Table 1), which implies that the bank has overinvested in IS labor and greatly underinvested in IT capital and this is in contrast with that of Prasad and Harker (1997), but it coincides with some other previously mentioned studies.

Despite this, it will be a long time before economists can make an objective assessment of the impact of IT on both the stability and efficiency of the financial system.

It is necessary to explore the above conclusion by looking at the bank's management practices in IS and IT capital to be able to answer the question of whether or not the increase in IT capital would contribute positively to the productivity and profitability of the bank.

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THE RESPONSE OF FINANCIAL SAVINGS TO FINANCIAL SECTOR LIBERALIZATION

Thomas Bwire and Caleb Tamwesigire

ABSTRACT

This paper investigates the response of financial savings to financial sector liberalization in Uganda during the period 1971–2000. A generic savings model is estimated using modern econometric techniques. The results suggest that financial liberalization, aimed at removing financial repression and achieving real positive deposit rates, is a necessary but not a sufficient condition for stimulating financial savings. These results imply that financial liberalization must be supplemented with other policies aimed at removing some structural bottlenecks that characterize Uganda's financial system. The results have great relevance to the formulation and conduct of monetary policy in Uganda.

1. INTRODUCTION

Financial liberalization in Uganda was implemented as part of broad-based structural adjustment programs (SAPs). In the financial sector, SAPs were specifically involved deregulating the determination of interest rates to improve financial intermediation and the mobilization of financial resources.

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The theoretical underpinning of the financial liberalization experiments implemented in Uganda and other developing countries since the early 1980s is the McKinnon–Shaw thesis, which posits a significant positive correlation between the real interest rate and savings (see McKinnon, 1973; Shaw, 1973).

Unfortunately, the nature of interest rate elasticity of savings in developing countries is still mixed and lacks a basis for comparing the results obtained. While there are empirical studies that have established a significant positive relationship between savings and real interest rate (Azam, 1996; Ostry & Reinhart, 1995), many of the remaining studies have concluded that the real interest rate has very little or no effect on the savings behavior in developing countries (among others, see, Adekanye et al., 1992; Clarke, 1996; Leita & Makonnen, 1986; Oshikoya, 1992; Warman & Thirlwall, 1994).

With particular reference to Uganda, evidence from the few studies on the savings–interest rate relationship has reported inconclusive results (see Ddumba & Obwona, 1996; Hisali, 1998). It may well be the case that, in addition to financial liberalization, there are other structural factors that are important for stimulating savings in Uganda, in which case it may be argued that financial liberalization is a necessary but not a sufficient condition for stimulating savings.

Moreover, economic theory is not unequivocal about the impact of financial liberalization on savings. In fact, positive real interest rates have two competing effects on private savings. They have a substitution effect in which savings increase as consumption is postponed and a wealth effect is created, in which savers increase current consumption at the expense of savings. Therefore, whereas the McKinnon (1973) and Shaw (1973) doctrines postulate that under conditions of financial repression the substitution effect dominates the wealth effect and also predicts a shift in the composition of wealth from non-financial to financial assets – thereby enhancing financial intermediation – the impact of a rise in real interest rate on private savings is ambiguous and can only be established empirically.

Furthermore, there are some arguments in the literature that support the notion of low interest rates, especially below the equilibrium level. The argument is that low interest rate would encourage investment and reallocate financial resources to preferred sectors. Giovannini (1983) argues that authorities keep low interest rates to make cheaper the financing of the budget deficit. As Fry (1993) puts it, financial restriction encourages financial instruments and institutions from which the government can expropriate seigniorage and discourage others.

In addition, neo-structuralists including Taylor (1983) and Van Wijnbergen (1983) argue that if informal and/or curb markets are prevalent, an increase in the real interest rate will not raise the rate of savings where the portfolio reallocation is away from the informal sector. This is because, much as a rise in deposit rates causes a shift from curb market deposits to the formal financial sector deposits, funds that are moved out of the informal market into the domestic banking system are subjected to reserve requirements that may cause a decline in the total supply of credit in the economy. Hence, as argued by Murinde (1996) and Green and Murinde (1998), a rise in real interest rates in the curb market may lead to a fall in savings in the formal sector.

Overall, therefore, financial liberalization appears to be a necessary but not sufficient condition for stimulating savings. Moreover, in theory, it is not altogether clear that positive real interest rates stimulate savings unconditionally. It is necessary to conduct empirical tests of the relationship between financial liberalization and savings.

This paper aims to empirically investigate the impact of financial liberalization on savings and to study the relative impact of other additional factors that directly affect savings in Uganda.

In what follows, the remainder of the paper is structured in three sections. Section 2 presents the econometric methodology, including the model, the estimation and testing procedure, and data and measurement. The empirical results are presented in Section 3. The conclusions and policy recommendations of the study are reported in Section 4.

2. ECONOMETRIC METHODOLODY

2.1. The Model

We specify an eclectic model that is inspired by Giovannini (1985), Fry (1988), Khan and Aftab (1994), among others. The model predicts that nominal financial savings (proxied by the total of time and savings deposits of commercial banks[1]) are determined by the financial intermediation ratio (proxied by the ratio of M2 to GDP), population per bank branch (proxied by the ratio of total population to commercial bank branches),[2] bank credit to the private sector ratio (measured by ratio of credit flow to private sector to GDP), nominal per capita income (measured as ratio of nominal GDP to total population), the nominal deposit rate (r) and expected inflation rate (measured using CPI), such that:

$$P_t^e = \left(\frac{CPI_t - CPI_{t-1}}{CPI_{t-1}}\right)100 \tag{1}$$

where CPI_t = consumer price index in period t and CPI_{t-1} = consumer price index for the previous period (t – 1).

Since Uganda began meaningful financial sector liberalization programs only in 1987, the sample is broken into the pre-ESAP (1971–1987) and the ESAP (1988–2000) periods in an attempt to investigate if there were any structural changes between the two periods. In addition, a dummy, which assumed values of one (1) for ESAP period and zero (0) otherwise and Chow break point test have been used for this structural policy change. Accordingly,

$$S_t = \alpha_0 + \alpha_1 FR_t + \alpha_2 PB_t + \alpha_3 CP_t + \alpha_4 Y_t + \alpha_5 INF_t + \alpha_6 R_t + \alpha_7 D + \varepsilon_t \tag{2}$$

where S_t = nominal financial savings, FR_t = financial intermediation ratio, PB_t = population per bank branch (a measure of financial institutions accessibility, CP_t = bank credit to the private sector as a ratio of GDP (a measure of financial development), Y_t = nominal per capita income (as an activity variable), INF = expected inflation rate, r = the nominal deposit rate, D = dummy variable, and ε_t = i.i.d. $N(0,\sigma^2)$ error term.

2.2. Estimation and Testing Procedures

The first step of the analysis involves pretesting each variable to determine its order of integration, since by definition cointegration necessitates that the variables be integrated of the same order. The augmented Dickey–Fuller (ADF) unit root testing procedure (Dickey & Fuller, 1979) is used to test for the stationarity of the series. This tests the size of the coefficient ψ in the following equation:

$$\Delta y_t = \beta_0 + \lambda t + \psi y_{t-1} + \beta_i \sum_{i=1}^{\ell} \Delta y_{t-i} + \varepsilon_t \tag{3}$$

where t denotes the time trend. Acceptance of the null hypothesis that $|\psi| = 0$ confirms the presence of a non-stationary process.

Assuming that the results in step one indicate that at least one series is integrated of the same order as the dependent variable, step two involves formulation and estimation of the theoretical long-run equilibrium relationship. The concept of cointegration implies that if there is a long-run relationship between two or more non-stationary variables, deviations from long-run relationship are stationary. To test for cointegration among these seven series, a multivariate cointegration technique developed in Johansen (1988)[3] and applied in Johansen and Juslius (1990) is used. Specifically, given an $N \times 1$ vector of variables, X_t, where in this case $X_t = (s,fr,pb,cp,r,y,\text{inf})$, assume at date t, and also, considering a VAR model of order p with Gaussian errors, the dynamics of X_t are presumed to be governed by a pth-order Gaussian vector autoregression:

$$X_t = c + \pi_1 X_{t-1} + \cdots + \pi_p X_{t-p} + \varepsilon_t \tag{4}$$

where $X_t = n \times 1$ vector of variables $(s,fr,pb,cp,r,y,\text{inf})$, $c = n \times 1$ vector of constants or drift terms (7×1 in this case), $\pi_i = n \times n$ matrices of time-invariant coefficients (7×7 in this case), $\forall i = 1,\ldots,p$ $\varepsilon = n \times 1$ vector of i.i.d. errors with a positive covariance matrix.

To distinguish between stationarity by linear combinations and by differencing, Eq. (4) is reparametized to include an error-correction term. Therefore, the system in Eq. (4) can be written in vector error-correction form:

$$\Delta X_t = c + \sum_{i=1}^{p-1} \Gamma_i \Delta X_{t-p} + \Pi X_{t-p} + \varepsilon_t \tag{5}$$

where $\Pi = -I\left(-\sum_{i=1}^{p} \pi_i\right)$, $\Gamma_i = -(\pi_{i+1} + \cdots + \pi_i), \forall_i = 1,\ldots,p-1$, $\Delta =$ the first difference operator, $p =$ optimal lag length, $\varepsilon_t \sim \text{i.i.d.}(0,\delta^2)$ – serially uncorrelated random error term.

Eq. (5) differs from a standard VAR in differences because it includes the error-correction term ΠX_{t-p}. The system represented in Eq. (5) also contains information on both the short- and long-run adjustment to changes in X_t, via the estimation of Γ_i and Π, respectively, and specifically whether the dynamic responses of the variables conform to theory.

Granger representation theorem asserts that if the stochastic matrix Π has reduced rank $r<n$, then there exist $r \times n$ matrices α and β each with rank r such that $\Pi = \alpha\beta'$ where β is the matrix of cointegrating vectors and α the adjustment coefficients. Johansen's method is to estimate the Π matrix in an unrestricted form, and then test whether the restrictions implied by the reduced rank of Π matrix, that is, there are $r \leq (n-1)$ cointegrating vectors present that can be rejected.

2.3. Data and Measurement

Quarterly time series data on the Ugandan macroeconomic variables for the period 1971:I–2000:IV is used in the study. All variables are transformed to natural logarithms before estimation. The data are taken from the *International Finance Statistics* published by the International Monetary Fund. Since the series on income and population were not readily available on quarterly basis, the existing annual data were transformed into quarterly data using the computer method of direct linear interpolation.

3. EMPIRICAL RESULTS

3.1. Univariate Test Results

Descriptive statistics for the data were undertaken and the results of the test are summarized in Table 1(a). This shows that all the variables satisfy the normality test in levels.

Using conventional testing procedures of ADF method the order of integration of the variables (and the degree of differencing required to induce stationarity) was determined. The unit root test results are presented in Table 1(b). The hypothesis of a unit root is not rejected for any of the Ugandan time series. All variables are stationary only for the first difference.

3.2. Cointegration Test Results

After determining the order of integration, we try to establish whether the non-stationary variables are cointegrated. This was because, as pointed out

Table 1 (a). Descriptive Statistics for Variables in Levels.

	CP	*FR*	*INF*	*R*	*S*	*Y*	*PB*
Mean	39.19	11.26	20.98	21.08	43180.25	12359.52	2.817108
Median	32.97	8.57	10.77	14.08	125	2.007159	3.18
Maximum	113.33	30.99	87.63	80.83	287060	437365.6	5.27
Minimum	0.059669	0.010629	0	0.15	10	0.009788	0.99
Std. dev.	27.1758	8.070034	22.61044	18.62	81967	58383.89	1.267842
Skewness	0.9068	0.797171	1.132981	1.247411	1.38208	5.707479	−0.07179
Kurtosis	3.172205	2.698203	3.203772	3.15619	4.647136	3.46632	1.8965
Jarque–Bera	16.59398	13.16503	25.88055	34.786	77.0806	6251.48	6.191258
Probability	0.249	0.1384	0.401	0.421	0.142	0.211	0.45247
Observations	120	120	120		120	120	120

Table 1(b). Testing for Unit Roots.

	ADF Levels		ADF First Difference	
Macro Variables	ADF	Order of Integration	ADF	Order of Integration
LCP	–0.171	I(1)	–6.94*	I(0)
LFR	–1.564	I(1)	–5.65*	I(0)
LINF	–2.910	I(1)	–11.25*	I(0)
LR	–2.509	I(1)	–11.98*	I(0)
LS	–2.031	I(1)	–10.68*	I(0)
LPB	–2.034	I(1)	–8.076*	I(0)
LY	–3.229**	I(1)	–4.93*	I(0)

Notes:
L is logarithm and ADF is Augmented Dickey–Fuller.
MacKinnon (1980) critical values are used for rejection of hypothesis of a unit root.
Critical values for ADF statistics (in levels) are –4.04, –3.4491, and –3.1495 at 1, 5, and 10 percent, respectively.
Critical values for ADF statistics (in first difference) are –4.0387, –3.4484, and –3.1491 at 1, 5, and 10 percent, respectively.
*Significant at the 1 percent level.
**Significant at the 5 percent level.

by Engle and Granger (1987), even though individual time series are non-stationary, linear combinations of them can be, because equilibrium forces tend to keep such series together in the long run. When this happens, the variables are said to be cointegrated and error-correction terms exist to account for short-term deviations from the long-run equilibrium relationship implied by the cointegration.

Results from the cointegration test are presented in Table 2, in which the maximal eigenvalue statistics are reported. The cumulative form of the eigenvalue statistic and/or the trace statistic is not reported. Rather, we compute the trace statistic and only report the number of cointegrating equations.

The eigenvalue statistics reject the null hypothesis that there are zero cointegrating vectors or seven common trends. The test suggests that there are two long-run relationships (see Table 2) among the seven variables (*S*, *CP*, *FR*, *INF*, *R*, *PB*, and *Y*). However, as shown in Table 3, only one long-run savings function has been specified.[4]

Following the results in Table 2, cointegration is accepted and therefore the residual generated from the long-run savings function tabulated in Table 3 if lagged once (ECT_1) can be used as an error-correction term in the dynamic model.

Table 2. Johansen Cointegration Test Results.

Eigenvalue	Likelihood Ratio (LR)	5 Percent Critical Value	Hypothesized Number of Cointegrating Equation(s)
0.400750	184.4063	146.78	None*
0.288612	125.5174	114.90	At most 1**
0.233213	86.35561	87.31	At most 2
0.179621	55.81778	62.99	At most 3
0.124877	33.04908	42.44	At most 4
0.111530	17.70912	25.32	At most 5
0.035106	4.109811	12.25	At most 6

Notes:
LR test indicates two cointegrating equations at 5 percent significance level.
*denotes rejection of the hypothesis at 5 percent significance level.
**denotes rejection of the hypothesis at 1 percent significance level.

Table 3. Estimation Results for the Long-Run Savings Function.

	Parameter Coefficients
C	–2.688798 (0.4332)
LCP	–1.152565 (0.56676)
LFR	–0.351083 (0.045)
LINF	–0.265883 (0.12234)
LPB	0.959197 (0.14369)
LY	–0.398175 (0.04219)
LR	0.024356 (0.03416)

Note: Values in parentheses are t-statistic values.

3.3. Estimation of the Error-Correction Model and Results

Following the Engle and Granger (1987) representation theorem, the third step involved an estimation of the error correction of the relationship and testing the adequacy of the estimated equation. An error-correction model is specified:

$$\Delta LS_t = \delta_0 + \sum_{i=0}^{k} \delta_i \Delta LZ_{t-i} + \sum_{i=1}^{k} \delta_i \Delta LS_{t-i} + \lambda_1 ECT\_1 + \varepsilon_t \tag{6}$$

where Z_t is a vector of cointegrated variables as is defined before and ECT_1 is the error-correction term lagged one period with λ_1 as a measure of the adjustment mechanism.

Eq. (6) represents the initial overparametized error-correction model. Using Hendry's (1986) general-to-specific approach, we proceeded through a simplification process to make the model more interpretable and a certainly more parsimonious characterization of the data. The simplification process, guided by statistical rather than economic reasons, proceeded principally by setting certain parameters starting with those with "t" values between less than one and zero in absolute terms to zero.[5] The model is also assessed in terms of diagnostic tests such as residual autocorrelation, normality, and heteroskedasticity, in addition to information criterion (Adams, 1997).

Using the general-to-specific modeling procedure, the analysis began with three lags[6] for each variable, the dummy variable and the error-correction term, ECT_1. The overparametized model was reduced until a parsimonious one was obtained. The estimation results of the parsimonious model are presented in Table 4.

Comparing the general and the preferred model results, the reduction process eliminated most of the insignificant variables without losing valuable information. Specifically, the Akaike information criterion (AIC) and the Schwarz Bayesian information criterion (SBC) declined, respectively, from –0.13 and 0.58 in the general model to –0.28 and 0.18 in the preferred model. The regression results show that the goodness of fit is satisfactory (adj. R-squared = 0.72), implying that the regressors in the model explain about 72 percent of the variations in financial savings during the 1971–2000 period. Thus, about 28 percent of financial savings remain unexplained. The F-statistic of 5.53, with a probability value of 0.0000, indicates that the overall model is highly significant. This implies a rejection of the null hypothesis that all the right-hand side variables except the constant have zero parameter coefficients.

The Durbin–Watson (DW) statistics does not point to the serious autocorrelation problem. The Jarque–Bera statistic for testing for normality of the residual for the estimated model is 127.96, with a probability value of 0.016. Therefore, the normality assumption is not rejected. The autoregressive conditional heteroskedasticity for stability of the residuals yields an F-statistic of 2.286, with a probability value of 0.133332. This is quite satisfactory in terms of explaining the coefficient stability of the model.

In addition, the Ramsey RESET test for specification error yields an F-statistic of 1.35, with a probability value of 0.249. This suggests that the

Table 4. Estimation Results of the Preferred Model (1972:2–2000:4).

Variable	Coefficient	*t*-Statistic
C	–0.015551	–0.426887
DLS_1	0.344132	3.311146*
DLS_2	0.229637	2.195804**
DLS_3	0.238118	2.779594*
DLCP_2	0.135005	1.271662
DLCP_3	0.155128	1.825316***
DLFR	0.350152	1.653356
DLFR_2	0.612681	2.604638**
DLINF	0.079266	2.139104**
DLPB_1	–0.274757	–1.082468
DLPB_2	0.358054	1.373580
DLPB_3	–0.366465	–1.445569
DLR	0.029367	1.587392
DLR_3	–0.059145	–3.202718*
DLY	0.347881	1.379989
DLY_1	–0.235674	–1.553764
DLY_2	0.467319	1.675562***
D98	0.090537	2.198295**
ECT_1	–0.228010	–2.617762**

Notes:
$R^2 = 0.735089$, adj. $R^2 = 0.7241684$, $F(30, 85) = 5.527104$ (0.000000), DW = 2.150763, SE of regression = 0.195447, and $n = 115$.
Information criteria: AIC = –0.277202 and SBC = 0.176309.
*Significant at the 1 percent level.
**Significant at the 5 percent level.
***Significant at the 10 percent level.

model is not misspecified. Also, the Breusch–Godfrey serial correlation LM test yielded an F-statistic of 1.34, with a probability value of 0.267. This reveals that there is no serial correlation among variables.

The results of the model evaluation reveal that the fundamental statistical requirements have been adequately met; thus, it can be inferred that the empirical results of the model are indeed reliable. The next section discusses the economic interpretation of the empirical results.

At a 1 percent level of significance, the coefficients of the first and third lags of financial saving (S) and the third lag of real deposit rate (R) are significantly different from zero. However, the coefficient for the third lag of real deposit rate (R) is not correctly signed as expected. The coefficients of the second lag of financial savings (S), the second lag of financial intermediation ratio (FR), the first difference of expected inflation rate (INF), the dummy variable (D_{98}), and the lagged error-correction term (*ECT_1*) are significantly different from zero and bear the hypothesized positive signs at the 5 percent level. The coefficients of the third lag of bank credit to the private sector ratio (*CP*) and the second lag of per capita income (*Y*) have the expected positive signs and are weakly significant at the 10 percent level while the coefficients of the first and third lags of population per bank branch (*PB*) are insignificant though correctly signed.

The results show that the error-correction term (*ECT_1*) in the model is of the correct sign and is significant at the 5 percent level. This confirms our earlier results that the specified macroeconomic series are cointegrated. The error-correction term (*ECT_1*) coefficient of –0.228 implies that in each period the level of savings adjust by about 22.8 percent of the gap between the current level and the long-run equilibrium level.

The negative influence of the third lag of the real deposit rate (*R*) on financial savings implies that the wealth effect dominates the substitution effect, whereby an increase in the real deposit interest rate raises the stream of future income and as such encourages current consumption. In the Ugandan context, this could be explained by the fact that Ugandan's saving behavior is not responsive to oscillations in the real deposit rate. This is so because, since the introduction of ESAP, the interest rates on deposits have been rising at least to only slightly negative or modestly positive levels. One can therefore conclude that in Uganda people save for other motives like precautionary, bequest reasons, erection of monuments upon one's death as well as securing of safe custody of their monies rather than the deposit rate incentives. The insignificance of the correctly signed coefficient of the first difference of the real deposit rate (*R*) implies that in the short run, people remain skeptical about the sustainability of the seemingly attractive returns on deposits; moreover, returns to such a portfolio choice are not due in the very short run but rather in the long run.

The coefficient of the second lag of the variable capturing financial intermediation (*FR*) and/or bank loanable funds carry a positive sign and is significant at the 5 percent level. This is an indication of the long-run positive correlation between financial intermediation and financial savings. It is thus a humbling fact that financial savings rate in Uganda depends on the amount of loanable funds available with the commercial banks.

The coefficient of the first difference of inflation rate (*INF*) has a significant positive impact on financial savings. The positive correlation between inflation and financial savings could be a result of the precautionary behavior by savers. This could be attributed to the uncertainty about such shocks like bad weather, business booms, oil crisis, and rumors of war among others. This often translates to instabilities in general price levels and therefore prompts precautionary savings. The precautionary saving, however, does not constitute loanable funds and therefore cannot be depended on for long-term investment.

The dummy (D_{98}), a variable representing the impact of financial liberalization on financial savings mobilization, has a significant and correctly signed coefficient. This implies that the changes brought about by the liberalization of the financial sector had a positive impact on financial savings behavior in Uganda. Moreover, the Chow breakpoint test for testing structural breaks as at 1988 yielded an F-statistic of 1.58, with a probability value of 0.15. This further confirms the same results by rejecting the null hypothesis of stable coefficients and/or equal parameters in the two sub-periods (pre-ESAP and ESAP).

The coefficient of the third lag of bank credit to the private sector ratio (CP) is weakly significant at the 10 percent level and has the a priori expected positive sign. In the long run, bank credit to the private sector has an indirect impact on savings via an improvement in investment and economic growth. Increasing bank credit to the private sector increases investment, thereby increasing the growth rate. This induces savings via the income effect. However, this weak result can be attributed to the high default rate. Among the causes of high default rate include adverse costs or price movements, inadequate funding of the projects, diversion of funds by the proprietor(s), insecurity, weather vagaries, and, perhaps, the still alien idea of banking to many.[7]

Moreover, the coefficient for the second lag of income per capita (Y) is weakly significant at the 10 percent level and has the a priori expected positive sign. This justifies the Keynesian absolute income hypothesis that savings increase with absolute income.

4. CONCLUSION AND POLICY IMPLICATIONS

The econometric results reveal that the major determinants of financial saving behavior in Uganda include past savings behavior, financial intermediation ratio, per capita income, bank credit to the private sector ratio, and expected inflation. Moreover, there is significant evidence that financial sector reforms adopted in the late 1980s have generally had a positive contribution to the mobilization of financial savings.

In terms of policy implications, the findings of the study show that financial conditions do matter in the behavior of savers. Therefore, policies that promote financial development and intermediation should be promoted. Government can, for instance, improve intermediation by reducing taxation on the financial sector and give incentives for its development. An integration of the fragmented financial markets is highly desirable.

The current experiment with financial liberalization and restructuring that are designed to improve the efficiency of financial intermediaries will lead to economic growth only if credit to the productive private sector enterprises increase. This therefore calls for dismantling any impediments to increased availability of credit to the private sector. To the problem of high default rates, commercial courts or tribunals need to be instituted to speedily deal with enforcement of loan contracts. Besides, commercial banks need to have a mechanism of sharing information on defaulters. This will close the information gap problem, as a result of which adverse selection and moral hazard problems have been thriving.

Since the proliferation of bank branches is no panacea to increased savings, convenient opening hours, use of local labor resources, and a familiar language could be a complement to the expansion of commercial bank branches. The easier access thereafter would reduce transaction costs in terms of distance and time. This is likely to reduce the portion of savings that is diverted to non-productive uses and as a result the rate of capital accumulation for a given savings rate is bound to increase.

To the extent that financial sector liberalization enhances financial savings mobilization, then, for financial savings to increase, the government should continue with the financial liberalization policy in general. Emphasis should be put on structural reforms such as promoting a competitive and viable domestic banking system, with an adequate regulatory and supervisory framework. This should be complemented by macroeconomic stability – that is, fiscal deficits, rapidly depreciating exchange rate, and high inflation should be put in check. This calls for appropriate sequencing of the financial reforms. In implementing such reforms, it is wiser to move gradually and to improve economic fundamentals first before complete deregulation.

It is also evident from the study that for financial savings to increase, policies to raise people's income and at the same time promote economic growth would enhance growth of savings. This and the preceding policy measures recommended should, however, be taken as a package, which, if implemented, may enhance the banks' capacity to mobilize financial savings. This will enable Uganda to reduce dependence on external resources and realize development on a sustainable basis.

NOTES

1. The choice of M2 needs to be appreciated from both the narrow financial system and lack of data, especially that of the thrift institutions. The M1 component, that is, CC and DD, are netted out mainly because neither of them earns interest rate in Uganda.
2. Commercial bank branches are considered since commercial banks dominate Uganda's financial system. This is due to their size, local ownership, and extensive branching.
3. The test is preferred because its optimality has been shown by Phillips (1991) in terms of symmetry, unbiasedness, and efficiency properties. A Monte Carlo study by Gonzalo (1994) supports the superior properties of the Johansen technique relative to several other cointegration techniques, the ADF test suggested by Engle and Granger (1987) inclusive.
4. The normalization process was guided partly by economic theory, according to which financial savings is the regressand and all the other variables are regressors, and partly by statistical reasons. The estimated F-statistic of one of the long-run relationships (not tabulated herein) was 64.167 with a probability value of 0.054. The insignificance of this F-statistic implied model misspecification. Thus, by these economic and statistical evidences, the equation was dropped.
5. The overall validity of the reduction sequence is the need to maximize the goodness of fit of the model with the minimum number of variables.
6. The optimal lag length of three (3) was one at which increasing the order of the model by one lag could not be rejected using a likelihood ratio test statistic. The residuals generated herein when subjected to whiteness test (heteroskedasticity, autocorrelation, and normality tests) proved to be white.
7. They see any credit extended to them as a favor and hence chances of default are high.

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THE IMPACT OF ACCESS TO CREDIT ON HOUSEHOLD WELFARE IN RURAL VIETNAM

M. H. Quach and A. W. Mullineux

ABSTRACT

In this paper, we investigate the determinants of household borrowing from the formal financial sector, the determinants of credit rationing by the formal sector and the impact of credit on household welfare in rural Vietnam. We find that education, savings, the area devoted to farming and the availability of formal credit are important determinants of both household borrowing and credit rationing by the formal sector. We also find that credit has a positive (albeit small) effect on household welfare in rural Vietnam. Our findings have policy implications for land and banking sector reform.

1. INTRODUCTION

A considerable amount of research has been devoted to understanding the functioning of credit markets, credit market imperfections and credit rationing (Amano, 1999; Bester, 1985, 1987; de Meza & Webb, 1987; Hellmann & Stiglitz, 2000; Stiglitz & Weiss, 1981; Swank, 1996). Credit

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rationing is broadly regarded as an excess demand for bank loans caused by the asymmetry of information on investment projects between banks and borrowers. Credit rationing occurs if some borrowers have limited access to credit. It thus affects the number of borrowers who receive credit. The other form of rationing occurs when some borrowers are rationed by the amount of credit, i.e., receive less than the amount of credit they demanded.

There has also been a focus on the analysis of rural credit markets (Meyer & Nagarajan, 1992, 2000), which are widely believed to be characterised by high lending transaction costs and lack of collateral when farmers do not own their own land, resulting in high interest rates being charged to borrowers. A combination of the above raises a very interesting research question: How do lenders in rural credit markets select borrowers and how much do they lend?

A number of recent papers have analysed such questions (Kochar, 1997; Pham & Izumita, 2002, Ranjula, 2002; Zeller, 1994). Their approaches and findings vary and differ, largely due to inadequate data. Zeller (1994) sees credit rationing as a function of access to the market conditional on the demand function of borrowers and finds that both formal and informal lenders[1] ration loan supply. They look at total household wealth and the leverage ratio of households. Pham and Izumita (2002) assume an excess demand for credit in the rural markets and thus see credit rationing as a function of access to the market or external credit rationing. They find that reputation, the dependence ratio and the amount of credit demanded are determinants of credit rationing. Their results imply that poorer households are more likely to be rationed.

Another question that one may also pose is, What determines the amount of credit that a household receives? Theoretically, the demand and supply of credit determine the amount of credit, and thus the demand and supply functions need to be separately identified (Pitt & Khandker, 1996; Yadav, Otsuka, & David, 1992). The problem of simultaneous functions leaves the construction of variables a critical issue for the consistent estimate of the household credit functions. Various approaches have been proposed to resolve this issue. For example, based on household and province attributes, Pham and Izumita (2002) construct variables that proxy for both demand and supply. They find that farming area and the total value of livestock are decisive determinants of household borrowing from the formal sector. Others, such as Pitt and Khandker (1996), Khandker (2003) and Khandker and Faruqee (2003), consider household characteristics (such as age and education), village fixed effects (such as prices of selected products) and the competition characteristics (such as characteristics of competitor villages) as the factors of household borrowing and find education and land owned are the core factors.

Another voluminous strand of literature on the rural credit market attempts to measure the impact of credit on household welfare.[2] Most of this research supports the idea that credit contributes positively to household welfare through improving household production or smoothing consumption over time. The literature also shows that most credit programs do not serve the poorest households, but when the poorest households are served they can definitely benefit through increased income and reduced vulnerability to "shocks" (Morduch & Haley, 2002).

In the context of rural Vietnam, there has been relatively little work (Pham & Izumita, 2002) on the three issues above: determinants of household credit access; determinants of household borrowing; and the impact of credit on household welfare.

This paper contributes to the literature by providing an empirical analysis of the rural credit market in Vietnam. The paper concentrates on formal credit,[3] as this plays a dominant role in Vietnam (Dao, 2002). The purpose of this paper is to analyse (i) the determinants of formal credit access in rural Vietnam; (ii) why and how formal lenders ration credit; and (iii) how access to credit contributes to household welfare. The rest of this paper is organised as follows. In the next section, we briefly describe the credit market in rural Vietnam. Next, we present the econometric model and the hypotheses. Section 4 discusses the characteristics of the household survey data that has been used in this paper. The results of the estimation and testing are presented in Section 5, along with an analysis of the results. The final section concludes with a summary of the findings and draws a policy conclusion.

2. THE RURAL CREDIT MARKET

The rural credit market in Vietnam has been well described in recent papers.[4] Briefly, the rural credit market in Vietnam is categorised into three core sectors: formal, semi-formal and informal. In the formal sector, key providers of microfinance services are the Vietnam Bank for Agriculture and Rural development (VBARD), the Vietnam Bank for the Poor (VBP – now known as Social Policy Bank), the People Credit Funds (PCFs) and the Rural Shareholding Banks (RSHBs). The semi-formal sector is dominated by National Programs, Microfinance Programs of Mass Organisations (such as the Women's Union or Farmer's Union), and Savings & Credit Schemes supported by NGOs and donors. These formal and semi-formal schemes however, were either unable to meet the huge demand for financial services or they could not reach the poor. In such cases, the poor have to rely on the informal credit schemes, which consist mainly of credit extended by families, friends, traders, ROSCAs and private moneylenders.

Typically, formal and semi-formal financial sectors in Vietnam provide credit to rural households for the specific purposes of rural development and/or poverty reduction at cheaper interest rates. Thus, these sectors basically employ their own criteria in selecting and screening borrowers who are eligible to receive loans from them. For this reason, we include the semi-formal sector in the formal sector in our study of credit exclusion.

There has been an increasing role of formal credit in the rural credit market. At the end of 1998, formal credit accounted for only 49%, but by the end of 2001, this figure was 70.2% of borrowing households in rural areas (Dao, 2002). In the formal sector, VBARD plays an important role. In 1998, it accounted for 68% of borrowing households and 75% of the outstanding loans in the formal sector (Dao, 2002). The network of VBARD branches reaches to village level using the model of village banking and/or mobile banking. The monthly interest rate charged in the formal sector is, on average, relatively low, at 1.26%, compared with the 3.95% charged in the informal sector (McCarty, 2001). The average loan size from the formal sector is higher at VND 3.2 million, compared with VND 1.7 million in the formal sector (Dao, 2002; McCarty, 2001). However, VBARD usually grants approximately 50% of the actual loan amount requested by a low-income household, and the most decisive criterion for lending is the list of assets of the potential borrower. The most commonly accepted form of asset/collateral is the Land Use Certificate (LUC).[5] If a household has not been provided with the LUC, certification by local authorities that the land is free from disputes can be used as a loan guarantee (Dao, 2002).

The rural credit market is segmented. Following government policy, formal financial institutions offer loans only for the purpose of production (Dao, 2002). In 1998, loans for production capital accounted for about 63.7% of all the loans taken from all sources (McCarty, 2001). Borrowers must present a business proposal when applying for a loan. Furthermore, although the government requires no collateral for loans of up to VND 10 million (equivalent to USD 600), households in general are required to provide their LUCs as collateral in order to a secure a loan (Dao, 2002). Business plans and LUCs are therefore important criteria for the screening of applicants (Mishkin, 2001, chap. 8, pp. 187–198) by formal lenders. The reasons for borrowing from the informal sector are various, of which smoothing consumption (Morduch & Haley, 2002; Rutherford, 1998) is important. A survey in 2001 conducted by the Microfinance Resource Center at the National Economics University revealed that almost 99% of interviewed households took loans from the informal sector at higher interest rates as a result of restricted access to the formal sector (Dao, 2001).[6] Because rural households in Vietnam traditionally dislike being indebted to individuals, informal borrowing can be viewed either as distress borrowing or the second choice. Households may however borrow from relatives or friends at very low interest rates, but they are not normally in the form of contracts and are therefore temporary.

The government policy framework regarding the rural credit market is also a big concern (Dao, 2002). First, although the interest rate has been liberalised gradually, the low basic interest rates have discouraged formal institutions from extending to more rural households due to high transaction costs that create financial repression (McKinnon, 1973; Shaw, 1973). Second, the issuance of LUCs has been slow and has not yet been completed in many provinces. This reduces the probability of access of rural households to formal credit. Furthermore, an effective use of LUCs as collateral requires a market for transferring LUCs, which does not exist. Third, the policy of expanding lending to rural households and the use of the group lending method[7] with support from social organizations (such as the Farmer's Union or the Women's Union) has been causing a danger of delinquency. Households are formed and certified by social organisations in order to get loans, and they may get higher loans in the next cycle if they do not default, i.e., a rotational system of lending. As a result, many households borrow from the informal sector (short-term loans from money lenders, friends and relatives), repay the formal loans and then get higher formal loans to pay back their informal lenders. Thus, a feature of the rural credit market in Vietnam is the dominance of formal credit. This is different from many other developing countries mainly because of the widespread network of VBARD branches and the supporting policy of the government to extend credit to rural households. This, together with low interest rates, explains why formal credit is preferred by rural households in Vietnam and the fact that households borrow from the informal sector simply because they lack access to the formal sector.

3. THE MODEL

Consider three sets of agents in the rural credit market: households (potential borrowers), formal lenders (such as VBARD) and informal lenders (such as money lenders, relatives, friends and ROSCAs). Of the households, there are borrowing and non-borrowing households. Households may borrow from formal lenders, informal lenders or both in order to finance their economic activities.[8] Households have a demand for credit and apply for loans. The demand for credit depends on household attributes and the village characteristics in which homeowners are living. Lenders then screen the applications and decide to whom they will offer loans and how much to offer (as the interest rate is fixed). As credit rationing is typical in credit markets (Stiglitz & Weiss, 1981), especially under financial repression, some applicants receive loans, others are rejected and yet others receive smaller loans than they desire. There are thus three major questions that need to be answered: (i) What are the determinants of the credit supply to households? (ii) What are the determinants of credit rationing in the rural credit market? (iii) How much does credit contribute to household welfare?

3.1. The Determinants of Credit

If we consider only households with loans as those that have a demand for credit, it may lead to a sample selection bias because it is possible that households without loans may have a demand for credit but be excluded. However, we ignore the problem that some households receive less credit than they demanded at the pre-set interest rate, i.e., they were also rationed but not in the form of exclusion. In other words, to control for sample selection bias, we adopt the financial exclusion form of credit rationing. Furthermore, the amount of credit supplied to a household that a researcher can observe is the result of the interaction between demand and supply. The difficulty is that the factors that are likely to affect household demand for credit are also likely to affect the supply of credit. For example, ownership of farming land may positively affect household demand for credit, while it may also positively affect the supply of credit if the lenders regard it to be collateral in rural market (e.g., in the case of VBARD). This implies that credit supply and demand curves cannot be easily identified. Thus, the determinants of a credit model, rather than demand and supply separately, are estimated as follows using Tobit regression:

$$y = y_i^* = \begin{cases} f(x_i, z_i) & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \tag{1}$$

where y_i represents the amount of credit that one household receives from source *i,* which equals $f(\boldsymbol{x}_i)$ if a household has loans and 0 otherwise ($i =$ source of credit such as formal, informal or total credit); $\boldsymbol{x}_i$ is a vector of explanatory variables that reflect household and local market characteristics; and z_i is a vector of *additional* explanatory variables proxied for the supply side of credit. Household characteristics include natural attributes (e.g., gender and age) and capital assets (e.g., length of education, land ownership and savings). Location characteristics represent distance-comparative-effects and consist of socio-economic factors such as prices of selected common goods and services (e.g., rice, pork and sewing) and the mean of local household characteristics (e.g., average of education years in commune).

The supply of credit depends on the terms of loan contracts, the availability of credit and the competition for loans among borrowers. Given an excess demand for formal credit, as a result of financial repression, and the lack of liquid collateral, we propose that what could actually determine the supply of credit is the availability of credit. We consider the availability of credit at three levels: province, commune and village. Availability of credit from source *i* is proxied by the total credit from source *i*. How lenders allocate credit depends on the competition between households at the commune and village levels (Khandker & Faruqee, 2003). Competition is dependent on household and local characteristics, which are included in $\boldsymbol{x}_i$ and the number of potential borrowers (proxied by the number of households in the commune). Moreover, as various sources of credit are substitutes and demand for one source of credit (such as informal credit) may depend on the supply of another source (such as formal credit), we also include the variable proxy for the supply of credit from a substitute source in z_i. Thus, z_i includes variables that proxy for the availability of credit, the number of competitors and the supply of credit from a substitute source.

3.2. Determinants of Credit Rationing

Eq. (1) is used to explain factors that affect the amount of credit supplied to a household. It does not specify why some households receive loans while the others are excluded or receive less than the amount demanded. In other words, we may see credit rationing in the rural market, but how do lenders ration credit? Clearly, borrowing is a function of demand for credit and thereby access to the market. What a researcher can observe as the outcome of this process is the amount of credit supplied and the outcome of applications. As the decision to offer loans is conditional on the decision to apply for loans, it is necessary to separate these two stages: first households decide whether to apply for loans and then lenders decide whether to offer or reject the applications. We employ the Heckman approach (see Heckman, 1976, 1979, 1980, Heckman, & Ashenfelter, 1974), in which the probability of a household receiving a loan depends first on it has a demand for credit and then on whether its application is accepted by the lender (see similar framework, for example, Zeller, 1994). The first-stage model takes the form below:

$$\boldsymbol{P}(\boldsymbol{y}_i) = \boldsymbol{f}(\boldsymbol{x}_i) \tag{2}$$

where $\boldsymbol{y}_i$ equals 1 if a household has demand for credit from source i, and 0 otherwise; $\boldsymbol{x}_i$ is a vector of explanatory variables that are similar to $\boldsymbol{x}_i$ in Eq. (1), and then

$$\boldsymbol{P}(\boldsymbol{y}_i) = \boldsymbol{f}(\boldsymbol{x}_i, z_i, \xi_i) \tag{3}$$

where $\boldsymbol{y}_i$ equals 1 if a household receives loans from source i; $\boldsymbol{x}_i$ and $\boldsymbol{z}_i$ are vectors of explanatory variables. ξ_i is the Mill's ratio (see Greene, 2003; Wooldridge, 2003 for details) computed from Eq. (2), which controls the sample selection bias. Vector $\boldsymbol{x}_i$ in Eq. (3) represents the household and local characteristics that the lender may use to screen applicants such as age, education, savings and land use. Vector z_i again represents the supply side of credit, which includes proxy variables for the availability of credit and competition between communes (e.g., poverty incidence in the commune and province and average education standards in the commune).

3.3. The Impact of Credit on Household Welfare

The purpose of this subsection is to estimate the effect of household credit (borrowings) on household welfare. Since household welfare (e.g., expenditure) is positively affected by factors that also affect household credit, a simple regression of a welfare equation conditional on household credit may generate biased results. Pitt and Khandker (1996) outline three possible sources of endogeneity of household credit. First, it is possible that credit is not randomly allocated. Lenders (especially formal lenders) may allocate credit based on local socio-economic conditions (e.g., poverty incidence). Second, even if the allocation of credit is random, it is possible that unobservable local attributes may well affect both household demand for credit and household welfare. Third, unmeasured household attributes may affect both household demand for credit and household welfare. For example, households with more effort and dedication may demand more credit and thus create higher quality welfare. Recent studies have proposed different techniques but the same approach to this problem (e.g., Khandker & Faruqee, 2003; Pham & Izumita, 2002; Pitt & Khandker, 1996). The prevalent approach uses instrumental variables to control the endogeneity of credit in the first stage and then corrects it for the household welfare equation in the second stage. We adopt the econometric framework proposed in Pitt and Khandker (1996) and Khandker and Faruqee (2003). Consider the reduced form of the household welfare equation, as follows:

$$\boldsymbol{y}_i = \boldsymbol{f}(\boldsymbol{C}_i, \boldsymbol{x}_i, \boldsymbol{u}_i^Y) \tag{4}$$

where the subscript indicates household i; $\boldsymbol{y}_i$ indicates the outcome of interest (e.g., per capita expenditure); C is the amount of credit borrowed; $\boldsymbol{x}_i$ is a vector of observable factors affecting household welfare; and $\boldsymbol{u}^Y$ is a vector of unobservable factors of welfare. Vector $\boldsymbol{x}_i$ includes household and location characteristics (e.g., age, gender, savings and prices of selected goods and services). As $\boldsymbol{u}^Y$ is unobservable, it is possible that household credit may serve as an indicator of these unobservable variables, and thus it causes biased results in the estimation of Eq. (4).

To offer a solution for endogenous credit, we first estimate the determinants of household credit, which include instrumental variables that will not be included in Eq. (4) but can be used to predict the amount of household credit that does not depend on household characteristics. Appropriate instrumental variables should not be correlated with household welfare but must be closely correlated with the amount of credit borrowed. In Eq. (1), there are two sets of variables, of which we can see the availability of credit may well serve as instruments. It is safe to assume that the availability of credit at the commune and village levels does affect the total household borrowing but it does not affect the welfare at the household level. Thus the first stage equation is similar to Eq. (1). However, we use the total household borrowings as a dependent variable, rather than borrowing from one specific source. The reason for using the total credit is that if we use one source of credit, it is possible that another source of credit, rather than the controlled source, affects the household welfare. The predicted values are then used instead of actual values in the second stage (i.e., Eq. (4)) to correct for selection bias. The alternative option is to insert both the actual values and the predicted residuals computed from first stage into the second stage equation. The coefficient of the predicted residual in the second stage equation then indicates whether or not the endogeneity of credit is significant.

4. DATA AND MEASUREMENT

The data are drawn from the Vietnam Living Standards Survey – VLSS 1997/1998. The survey was conducted in 1997/1998 by the General Statistical Office. The survey was funded by the UNDP and the Swedish International Development Authority (SIDA). The survey is a part of the Living Standards Measurement Study (LSMS) household surveys conducted in a number of developing countries with technical assistance from the World Bank. The survey covers a sample of 5,999 households, 194 communes and 388 villages. The proportion of rural households is 71.2% (4,269 households), and there are 38.9% of rural households borrowing from all sources. However, after adjusting for data omission, we have selected a sample of 4,101 rural households, of which there are 2,108 borrowing households. Of the borrowing households, 1,246 households borrow from formal sources; 1,213 households borrow from informal sources, resulting in a number of 351 households having loans from both sources. The informal sources of credit include money lenders, relatives and friends, ROSCAs and other individuals. If we exclude all households with zero-interest rate loans from informal sources (most of them have loans from friends and relatives), the sample of borrowing households reduces to 1,645 households. Table 1 gives a brief description of the sample, and Table 2 provides a statistical description of the key variables. Further analysis of variables is undertaken in the following sections.

5. THE RESULTS

5.1. Determinants of Formal Credit

We conducted two separate tests to estimate the determinants of household formal credit allocation. The first test (Test 1.1) is based on the whole sample of rural households with 4,101 observations, of which 1,246 households have formal loans. The second (Test 1.2), which looks at those who receive formal credit, uses the sample of borrowing households with 2,108 observations. The dependent variable is the log of household formal credit extended by time of interview.[9] The explanatory variables include household and location characteristics, the availability of credit and the variables that proxy for competition at the commune and village levels. We also use the proxy variable for the availability of informal credit at the village level for the reason that this source of credit may affect household demand for

Table 1. Summary of Borrowing Households.

	Households	Percentage	Average Loan Size (VND1,000)	Monthly Interest Rate
Borrowing households	2,108			
Formal source	1,246	100%	3,209	1.26%
Private banks and cooperatives		4.4%	2,230	1.59%
Government banks		82.2%	3,512	1.27%
Government programs and others		13.4%	1,547	0.87%
Informal source	1,213	100%	1,752	3.95%
Money lenders		19%	2,141	4.56%
Relatives		48%	1,861	2.63%
ROSCAs and other individuals		33%	1,366	3.69%
Non-borrowing households	1,993			
Total	4,101			

formal credit, as explained in Section 3. Table 3 presents the Tobit regression of the household borrowing equation (Eq. (1)).

At the 95% confidence level, we find that the age of the head of the household (AGE98) is positively and significantly related to the amount of formal credit supplied to households. The significance of the squared age indicates that middle-aged households receive the largest amount of formal credit. The amount of credit is therefore a nonlinear function of the age of the head of household. Education of households (EDUCYR98) is significant, implying that more educated households receive more formal credit. Farm households (FARM98) are seen to receive more credit, indicating that in rural Vietnam, farm households are the preferred clients. Formal credit extension is also dependent on the size of the household (HHSIZE), possibly implying that households with more members either demand more credit or formal lenders provide more credit to them because of their high earning capacity.

The total farming area of households (LGLAND980) is seen as an indicator of both collateral and the size of farm production and is positively

Table 2. Statistics of Key Variables.

Variables	Explanation of Variables	Non-Borrowing HHs		All HHs		Borrowing HHs		Formal Borrowing	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
AGE98	Age group of household head	4.543402	1.504427	4.284565	1.412567	4.039848	1.272664	4.084270	1.217065
AGE98*AGE98	Age squared	22.90467	14.51875	20.35235	13.19449	17.93928	11.29129	18.16132	10.80074
EDUCYR98	Education years of household head	6.150861	4.228838	6.492725	4.050438	6.815939	3.847384	6.857945	3.794083
FARM98	Dummy: Farm households = 1	0.753638	0.431000	0.758839	0.427840	0.763757	0.424874	0.795345	0.403611
GENDER98	Dummy: Male = 1	0.746613	0.435060	0.782004	0.412935	0.815465	0.388012	0.826645	0.378706
HHSIZE	Households size	4.511791	2.025933	4.849549	1.937950	5.168880	1.793819	5.344302	1.835241
LGLAND980	Log of farming area owned	6.435767	3.261838	6.683171	3.157325	6.917079	3.037519	7.064593	3.059102
LGFISA980	Log of financial savings (saving books, deposits .etc)	5.083349	2.323899	4.820754	2.385538	4.572486	2.416824	4.718702	2.456173
LGNFSA980	Log of non-financial savings (savings in kinds)	3.981200	3.834011	3.432162	3.758125	2.913075	3.609820	3.192871	3.668047
LGDETE98	Log of price of detergent in commune (VND 1,000/kg)	1.939069	0.328720	1.940150	0.327640	1.941172	0.326690	1.938566	0.327976
LGFSOU98	Log of price of fish source in commune (VND 1,000/bot)	1.542432	0.395370	1.509139	0.407122	1.477662	0.415575	1.444695	0.432034
LGNOO98	Log of price of noodle in commune (VND1,000/pack)	0.105278	0.119876	0.109959	0.125294	0.114385	0.130083	0.115257	0.137191
LGPORK98	Log of price of pork in commune (VND1,000/kg)	2.998697	0.167860	3.003199	0.168737	3.007455	0.169491	3.026338	0.171293
LGRICE98	Log of price of rice in commune (VND 1,000/kg)	1.235146	0.128080	1.234837	0.127256	1.234545	0.126501	1.233832	0.129430
LGSEW98	Log of price of sewing (VND 1,000/trouser)	2.675130	0.330479	2.694550	0.343081	2.712911	0.353682	2.759295	0.338541
EDUYR98C	Mean of education year in commune	6.442730	2.042569	6.493202	1.951857	6.540920	1.861263	6.412705	1.844661
LGLAN98C	Mean of log of farming area in commune	8.038560	0.583207	8.080288	0.598650	8.119739	0.610412	8.170626	0.608952
RCPIGS98	Price index by region	0.977015	0.045514	0.979988	0.046528	0.982798	0.047306	0.988350	0.045113
LGVIIN980	Log of total informal credit in village	8.218244	2.804840	8.556792	2.597069	8.876870	2.340075	8.414376	2.840987
NOHHS98	Number of households in commune	667.3593	427.3440	654.3011	424.3382	641.9554	421.2058	596.4518	393.1924
LGPRFO980	Log of total formal credit at province level	14.60518	1.758588	14.80475	1.664795	14.99344	1.547901	15.22616	0.959694
LOGCFO980	Log of total formal credit at commune level	9.414417	2.432611	9.728391	2.208659	10.02524	1.927795	10.56044	0.906908
LGVIFO980	Log of total formal credit at village level	8.258445	2.986495	8.756093	2.640434	9.226593	2.162982	9.907602	0.983726
Observations	Number of households	1,993		4,101		2,108		1,246	

Table 3. Results from Tobit Regression: Determinants of Formal Credit..

	Test 1.1		Test 1.2	
	Coefficient	*z*-Statistic	Coefficient	*z*-Statistic
AGE98	3.758498	4.829326*	2.196420	3.872094*
AGE98*AGE98	–0.456323	–5.265458*	–0.214564	–3.333159*
EDUCYR98	0.185905	3.453552*	0.148874	3.690984*
FARM98	0.730163	1.612231	0.714636	2.130596*
GENDER98	0.476951	1.058321	0.314248	0.930317
HHSIZE	0.616284	6.420827*	0.222580	3.107933*
LGLAND980	0.465386	7.175849*	0.241026	5.013996*
LGFISA980	–0.165587	–2.211143*	0.135384	2.503009*
LGNFSA980	–0.261559	–5.118806*	0.042807	1.115107
LGDETE98	0.508889	0.954907	0.382457	0.969152
LGFSOU98	–1.488011	–3.492921*	–0.351738	–1.137395
LGNOO98	2.226429	1.672403**	0.622205	0.636572
LGPORK98	–0.996639	–0.658557	0.754390	0.667149
LGRICE98	–3.169625	–2.175630*	–2.563133	–2.367508*
LGSEW98	1.991168	2.920890*	0.618908	1.263769
EDUYR98C	–0.192808	–1.480780	–0.166986	–1.731353**
LGLAN98C	–0.747076	–2.058645*	–0.706285	–2.671740*
RCPIGS98	–2.380690	–0.505146	–5.937609	–1.725125**
LGVIIN980	–0.111652	–1.697568**	–0.420104	–8.006437*
NOHHS98	–0.000263	–0.552376	–0.000449	–1.278521
LGPRFO980	–0.052588	–0.231004	–0.388116	–2.359462*
LOGCFO980	0.728956	1.867763*	0.571618	1.984287*
LGVIFO980	2.872957	9.253923*	1.964455	8.633500*
C	–37.16056	–5.882620*	–10.25352	–2.220564*
Log likelihood	–5598.107		–4424.520	
Adjusted R-squared	0.196636		0.270345	
Total observations	4,101		2,108	
Positive observations	1,246		1,246	

*Significant at 5% level.
**Significant at 10% level.

and significantly related to the formal credit extended. This indicates that households owning more farm land demand more credit and formal lenders in fact offer more credit to those households.

Household financial and non-financial savings (LGFISA980 and LGNFSA980) are significantly related to formal credit, but with negative signs in the first test and positive signs in the second test. It is possible that households with high savings demand less credit and thus they receive less. But it is also possible that (in the second test) when we use as control only those households who are clearly revealed to be demanding credit, the positive signs of financial savings indicate that households with more financial savings are seen to be more creditworthy by formal lenders and thus receive more credit.

We find that the availability of formal credit at the commune level (LOGCFO980) and at the village level (LGVIFO980) is positively and significantly related to the formal credit extended to households. However, at the province level (LGPRFO980), the availability of credit is found to be negatively and significantly related in the second test. This implies that the availability of formal credit is an important determinant of the amount of formal credit that one household may receive, but either there is an inequality in allocation of formal credit between communes or there are too many communes within a province. Specifically, some communes may receive less credit than the others in the same province, and thus households living in these communes may receive less credit compared with other households living in other provinces. The availability of informal credit at the village level (LGVIIN980) is negatively and significantly related to household formal credit at the 90% confidence level in the first test and at the 95% level in the second test, implying that where there is an excess demand for formal credit, i.e., the formal sector does not meet the demand of credit by households, there exists a market for informal credit.

Of the proxy variables for location (fixed) effects, we find that the mean of education in the commune (EDUYR98C), the mean of farming area in the commune (LGLAN98C) and the price index of the province (RCPIGS98) are negatively and significantly related to household formal credit, especially in the second test. A possible explanation of this result is that because households in "better" communes often demand more credit, the amount of formal credit that any one household receives is less (but the number of households receiving credit might be higher). This may imply the fact that there is rationing in the amount of credit as well as financial exclusion.

In short, we have found that total farming area, financial and non-financial savings and availability of formal credit are significant determinants of household formal credit. Households owning more farming land demand more credit, and formal lenders are more likely to offer larger amounts of credit since LUCs can be used as collateral in rural Vietnam. Households with higher savings may demand less credit. However, if they have more savings and do have a need for credit, they may receive more generous formal credit allocation. The availability of formal credit at the village and commune levels is important to the amount of formal credit that one household receives. The results also show that there is an inequality in allocation of credit within a province or across communes within a province.

5.2. Determinants of Credit Rationing by the Formal Sector

In this section, we test two forms of credit rationing: credit exclusion and rationing of amounts of credit. In the first stage of testing, we use Eq. (2) and conduct tests on whether households demand formal credit. We use the sample of 4,101 households, of which 2,108 households request both formal and informal loans. Given that formal credit is a cheaper source and that it dominates the rural credit market in rural Vietnam as discussed above, we assume that if households request loans, they first seek formal loans and thus the dependent variable equals 1 for those who have either formal or informal loans. However, for a more reasonable assumption, households with zero-interest informal loans are excluded in the second test for the reason that non-zero interest borrowers are most likely to demand loans from the cheaper (rather than interest charging informal lenders) formal sector. There are 1,645 households with non-zero interest loans. Thus, the two alternative tests are presented in Table 4a, namely (2.1) and (2.2), respectively.

In the second stage, we use Eq. (3) and conduct the tests on how formal lenders decide to offer loans. The sample we use for these tests is those households who have loans, i.e., 2,108 and 1,645 households, respectively. There are two possibilities: (i) credit exclusion if a household does not receive any formal loans and (ii) rationing in the amount of credit if a household has both formal and informal loans.

For the test of credit exclusion, if households have formal loans (1,246 households), the dependent variable takes a value of 1, and otherwise 0. The inverse Mill's ratios, which are computed from the first stage, are included as explanatory variables in the second stage. Table 4b represents the second stage tests, Test 3.1 and Test 3.2. The significance of the Mill's ratios and high percentages of correct prediction (71.96% and 78.12%) indicate that the two-stage regressions are more appropriate.

For the test of rationing in amounts of credit, two types of tests were conducted: (i) If households have informal loans (1,213 and 750 households for the first and second samples, respectively), the dependent variable takes the value of 1, otherwise 0. The purpose of these tests is to see why households are either being excluded or rationed in amount of credit.

Table 4a. Results from Probit Regression: Probability of Applying for Formal Credit.

Variable	Test 2.1		Test 2.2	
	Coefficient	*z*-Statistic	Coefficient	*z*-Statistic
AGE98	0.166910	1.847101**	0.404057	4.265932*
AGE98*AGE98	–0.031483	–3.183275*	–0.054266	–5.170551*
EDUCYR98	0.010287	1.553428	0.010036	1.491136
FARM98	–0.061831	–1.130932	0.067442	1.202834
GENDER98	0.035150	0.649202	0.020321	0.364873
HHSIZE	0.096402	8.065885*	0.091849	7.588738*
LGLAND980	0.024723	3.170051*	0.014459	1.818839**
LGFISA980	–0.049451	–5.241171*	–0.032069	–3.388112*
LGNFSA980	–0.052710	–8.623011*	–0.048846	–7.782064*
LGDETE98	0.056098	0.882392	0.037159	0.573068
LGFSOU98	–0.279683	–5.383893*	–0.312052	–5.939800*
LGNOO98	0.467778	2.768203*	0.308479	1.820298**
LGPORK98	0.241978	1.389808	0.503740	2.853129*
LGRICE98	–0.392533	–2.223284*	–0.750968	–4.203524*
LGSEW98	0.462954	5.742108*	0.526625	6.459547*
EDUYR98C	0.050313	3.379183*	0.051269	3.390795*
LGLAN98C	0.113579	2.501985*	0.194549	4.240019*
RCPIGS98	–0.075613	–0.133571	1.203721	2.119201*
C	–2.701407	–3.646798*	–5.985611	–7.964278*
Log likelihood	–2609.430		–2526.231	
R-squared	0.081505		0.085321	
LR statistic	463.1079		471.2892	
Probability(LR stat)	0.000000		0.000000	
Total observations	4,101		4,101	
Dependent variable = 1	2,108		1,645	
Percentage correct prediction	63.35		64.81	

*Significant at 5% level.
**Significant at 10% level.

Table 5a presents the test results (Test 3.3 and Test 3.4 for samples 1 and 2, respectively), and the significance of the Mill's ratios indicates that the two-stage regressions are appropriate. (ii) If households have both formal and informal loans (351 households for both samples), the dependent variable takes the value of 1, otherwise 0. The purpose of this test is to see why households are being rationed in amount of credit. Table 5b shows the results (Test 3.5 and Test 3.6). The Mill's ratios are not significant in this test, and thus, the two-stage regression is not necessary.

Table 4b. Results from Probit Regression: Probability of Being Granted Credit.

Variable	Test 3.1		Test 3.2	
	Coefficient	*z*-Statistic	Coefficient	*z*-Statistic
AGE98	0.407103	2.809102*	0.106084	3.322559*
AGE98*AGE98	–0.032640	–1.914274**		
EDUCYR98	0.030897	3.025259*	0.041918	3.416101*
FARM98	0.259537	3.145633*	0.144148	1.476160
GENDER98	0.005030	0.060198	0.032832	0.339170
LGFISA980	0.046000	3.105118*	0.029831	1.808339**
LGNFSA980	0.029256	2.663487*	0.050780	4.029634*
EDUYR98C	–0.052447	–2.231807*	–0.045546	–1.641288
LGLAN98C	–0.234607	–3.469965*	–0.393176	–4.731628*
PORU98	–0.000670	–0.267192	–0.000686	–0.233648
NOHHS98	–0.000263	–3.230685*	–0.000290	–3.033580*
NOFPOR98	–0.000159	–1.073828	–0.000515	–2.950293*
LGPRO980	0.055014	4.108307*	0.057827	3.756366*
LGPRFO980	–0.128837	–3.329671*	–0.180923	–3.506067*
LOGCFO980	0.160149	2.407301*	0.007671	0.095329
LGVIFO980	0.371513	6.937432*	0.347980	5.416588*
MILLS (1 and 2)	–0.822340	–3.867150*	–0.735897	–3.894671*
C	–1.958554	–2.049839*	3.075123	2.701524*
Log likelihood	–1155.080		–792.9777	
R-squared	0.189976		0.129876	
LR statistic	541.8052		236.7214	
Probability (LR stat)	0.000000		0.000000	
Total observations	2,108		1,645	
Dependent variable = 1	1,246		1,246	
Percentage correct prediction	71.96		78.12	

*Significant at 5% level.
**Significant at 10% level.

5.3. Who Receives Formal Credit or Who is Excluded?

As shown in Table 4b, of the household attributes, we find that the age of the head of the household (AGE98) is positively and significantly related to the probability of applying for formal loans and the probability of being offered them. Education (EDUYR98) is not significantly related to the probability of applying but is significantly related to the probability of being offered credit, implying that formal lenders screen applications by using education levels. More interestingly, household savings (LGFISA980,

Table 5a. Probability of Being Excluded from the Formal Sector.

Variable	Test 3.3		Test 3.4	
	Coefficient	*z*-Statistic	Coefficient	*z*-Statistic
AGE98	–0.172633	–1.217220	–0.047822	–1.654851***
AGE98*AGE98	0.010842	0.651303		
EDUCYR98	–0.025805	–2.627402*	–0.025915	–2.392328**
FARM98	–0.223021	–2.764176*	–0.132880	–1.493275
GENDER98	0.011265	0.138057	–0.018445	–0.209019
LGFISA980	–0.066026	–4.600638*	–0.059837	–4.065854*
LGNFSA980	–0.036795	–3.501435*	–0.051019	–4.566935
EDUYR98C	0.022214	1.010183	0.010843	0.447920
LGLAN98C	0.136742	2.134553**	0.199247	2.720781*
PORU98	0.003735	1.582073	0.004931	1.909509***
NOHHS98	0.000436	5.354588*	0.000493	5.462981*
NOFPOR98	0.000135	0.938981	0.000374	2.364500**
LGPRO980	–0.033255	–2.593995*	–0.024726	–1.781610***
LGPRFO980	0.211338	5.691731*	0.301982	6.379988*
LOGCFO980	–0.228339	–3.597153*	–0.149362	–2.041934**
LGVIFO980	–0.219530	–4.569855*	–0.137358	–2.508216**
MILLS (1 and 2)	0.653818	3.248622*	0.554439	3.278574*
C	0.700191	0.816742	–3.538992	–3.387448*
Log likelihood	–1251.282		–1034.956	
R-squared	0.129286		0.087202	
LR statistic	371.5890		197.7450	
Probability (LR stat)	0.000000		0.000000	
Total observations	2,108		1,645	
Dependent variable = 1	1,246		750	

*Significant at 1% level.
**Significant at 5% level.
***Significant at 10% level.

LGNFSA980) reduce the probability of applying for credit but increase the probability of being offered it. This indicates that if households have savings, they are less likely to demand loans, but if they apply, they are more likely to be successful. In other words, banks are most willing to lend to those that least need to borrow. The productivity of farming land (LGPRO980), which is a proxy for the value of collateral, is also found to be positively and significantly related to the probability of being offered a loan.

As a proxy for competition among households within one location, the number of households in a commune (NOHHS98) reduces the probability

Table 5b. Probability of Being Rationed in Amount of Credit.

Variable	Test 3.5		Test 3.6	
	Coefficient	*z*-Statistic	Coefficient	*z*-Statistic
AGE98	0.381049	2.386669**	0.049810	1.589881
AGE98*AGE98	–0.037446	–2.080031**		
EDUCYR98	0.007475	0.666501	0.009271	0.789857
FARM98	0.004259	0.046046	–0.026075	–0.266399
GENDER98	0.025261	0.277560	0.005615	0.058386
LGFISA980	–0.043559	–2.987450*	–0.051701	–3.337208*
LGNFSA980	–0.020256	–1.882536***	–0.017048	–1.492603
EDUYR98C	–0.006331	–0.249587	–0.014025	–0.528158
LGLAN98C	–0.076753	–1.116748	–0.129386	–1.801081**
PORU98	0.004244	1.567901	0.004838	1.712917
NOHHS98	0.000264	2.940412*	0.000332	3.457073*
NOFPOR98	9.84E–05	0.584729	–8.28E–07	–0.004688
LGPRO980	0.034881	2.372414**	0.033052	2.161167**
LGPRFO980	0.136843	3.011024*	0.181051	3.590752*
LOGCFO980	–0.088627	–1.179738	–0.197566	–2.461886**
LGVIFO980	0.254907	3.913084*	0.241596	3.472660*
C	–5.175718	–5.462623*	–3.274568	–3.466064*
Log likelihood	–894.8133		–822.5585	
R-squared	0.057343		0.035411	
LR statistic	108.8660		60.39470	
Probability (LR stat)	7.77E–16		2.16E–07	
Total observations	2,108		1,645	
Dependent variable = 1	351		351	

*Significant at 1% level.
**Significant at 5% level.
***Significant at 10% level.

of receiving formal loans. This may be because there are more applicants for loans from large communes and thus the probability of success for each applicant is less. Similarly, the number of poor households in a commune (NOFPOR98) is negatively significant in the second sample (Test 3.2). This implies either that more applicants reduce the probability of success or that formal lenders may be discouraged from offering loans where there are more poor households. The mean of productivity of the farming area in a commune (LGPRO98C) reduces the probability of being offered credit. The possible reason is that in communes with high productivity, there are more households applying for loans and thus the probability of success for each household is low. This might imply a quota system of credit allocation by the formal lenders.

Availability of credit at the province, commune and village levels is found to be significantly related to the probability that one household is offered a loan. At the province level (LGPR980) it is found to be negatively significant, but at the commune level (LOGCFO980) and the village level (LGVIFO980) it is positively related. The different signs at different levels are not surprising as they imply inequalities in the distribution of formal credit between communes and villages within a province. However, the implication is that if formal credit is more available at the village and commune levels, an applicant household has a greater probability of receiving loans.

The results thus show that the age of the household head, education, savings, availability of credit and competition among households are the determinants of credit rationing in the rural credit market. Household savings may increase the probability of being offered loans as savings are seen either as collateral or as an indicator of household wealth. The availability of credit at the village and commune levels also increases the probability of being offered it as the gap narrows between demand and supply. However, the number of households and the number of poor households in the commune are variables that reduce the probability of being offered loans from formal lenders.

5.4. Who Faces Credit Rationing?

The above results have shown why some households receive loans from the formal sector while others do not. As an attribute of the Probit model, the results also indicate (with adverse signs of the coefficients) that households that do not receive any formal loans are those that are completely excluded from the formal sector. Looking further at those that are excluded from the formal sector, we conducted further tests to see why they are excluded and determine the difference, if any, between completely excluded and partly excluded households.

As shown in Table 5a, most of the key coefficients are with the adverse signs, compared with those resulting from the tests of households that have loans from the formal sector. This strengthens the above findings and once again indicates that the level of household education, the level of household savings and the availability of formal credit at the commune and village levels reduces the probability of being excluded.

However, when we look at those who are being rationed in amount of credit, i.e., those who receive loans from both formal and informal sectors, the results are interesting. As seen in Table 5b, clear evidence is not found of the effect of age and education levels of the household head on the probability of being rationed in amount of credit. The number of households in a commune increases the probability of being rationed in amount of credit from the formal sector at the 1% level of significance in both samples, indicating that there may be a quota system of credit allocation.

The level of financial savings is found to be negatively and significantly related to the probability of being rationed in amount of credit at the 99% level of confidence, again indicating that household savings reduce the probability of being excluded and being rationed in the amount of credit. The level of non-financial savings is negatively and significantly related to the probability of being partly excluded at the 95% level of confidence and for the second sample only.

Surprisingly, at the 99% level of confidence, the availability of formal credit at the province and village levels is positively and significantly related to the probability of being rationed in the amount of credit from formal credit for both samples, while the availability of formal credit at the commune level is negative and significantly related to the probability of being partly excluded at 5% significance for the second sample. The positive effect of the availability of credit at the village level indicates that demanding households may have a high probability of getting formal loans in the village where formal credit is available, but the amount of the loan is insufficient, and thus they have to borrow from the informal sector. This seems to prove the case of VBARD, which usually grants 50% of the loan amount requested and meets only 14% of the effective demand[10] for loans from the low income households in rural Vietnam (Dao, 2002).

The result thus suggests that the key reason why households are being rationed in the amount of credit is the quota system of credit allocation by formal lenders (mainly VBARD). It also indicates that savings are important factors influencing the amount of credit being granted in rural Vietnam.

5.5. The Impact of Credit on the Welfare of Households

The first stage regression uses Eq. (1). We use the sample of 4,101 households, of which 2,108 households have loans. The dependent variable is the log of total household borrowings, including formal and informal loans.

Table 6a. Results from Tobit Regression: Determinants of Household Borrowings.

Variable	Coefficient	z-Statistic
AGE98	1.349238	2.743424*
AGE98*AGE98	–0.222313	–4.091714*
EDUCYR98	0.074426	2.079463*
FARM98	–0.218607	–0.737600
GENDER98	0.308263	1.041345
HHSIZE	0.523353	8.092091*
LGLAND980	0.231562	5.406392*
LGFISA980	–0.216638	–4.325020*
LGNFSA980	–0.313294	–9.322477*
LGDETE98	–0.110967	–0.319148
LGFSOU98	–1.196459	–4.213158*
LGNOO98	2.887991	3.191280*
LGPORK98	0.798256	0.815365
LGRICE98	–1.209699	–1.243912
LGSEW98	2.166007	4.950512*
EDUYR98C	0.017579	0.209168
LGLAN98C	–0.248341	–1.000495
RCPIGS98	5.121724	1.625574
LGVIIN980	0.391335	8.247937*
NOHHS98	0.000433	1.435173
LGPRFO980	0.292953	3.189332*
LOGCFO980	–0.231167	–2.201784*
LGVIFO980	0.667861	7.758944*
C	–22.05987	–5.381328*
Log likelihood	–8284.762	
Adjusted R-squared	0.140771	
Total observations	4,101	
Positive observations	2,108	

*Significant at 5% level.

Explanatory variables include all variables that have been used in Section 3.1. The test results are presented in Table 6a.

Basically, there are no differences in the effects of household and location attributes on total borrowings, as compared with borrowing from formal sources of credit (see Tables 6a and 3). However, for the variables reflecting the availability of formal credit, there are some points to note: (i) availability of formal credit at the province level is found to be positively and significantly related to household borrowings, while it is found to be negatively and significantly related to formal credit and (ii) availability of formal credit at the commune level is found to be negatively and significantly related to household borrowings but positively and significantly related to formal credit. This possibly implies that where formal credit supply is restricted, households may borrow more from informal lenders.

In the second stage, Eq. (4) is employed. We use the sample of 4,109 households with three dependent variables in logarithmic form as proxies for household welfare: per capita expenditure, per capita food expenditure and per capita non-food expenditure. The explanatory variables, among others, include the log of total household borrowings and the predicted residuals computed from the first stage. The results are presented in Table 6b. The significance of predicted residuals to dependent variables indicates that the two-stage regressions are more appropriate.

The results show that household borrowing is indeed statistically and significantly related to household welfare. At the 95% confidence level, a 10% increase in total borrowings results in a 0.5% increase in per capita expenditure, 0.3% in per capita food expenditure and 1.1% in per capita non-food expenditure. This result confirms the hypothesis that access to credit increases household welfare and reconfirms findings from recent studies (Khandker, 2003; Khandker & Faruqee, 2003; Pitt & Khandker, 1996). However, the effect is found to be small, and it may raise the issue of cost-effectiveness in providing financial services to rural areas.

6. CONCLUSION

In this paper, an analysis of the rural credit market in Vietnam and its impact on household welfare has been attempted. Unlike many other countries, the formal sector has dominated the rural credit market in Vietnam, and so the results may potentially differ in the case of Vietnam. The market share of the formal sector has actually increased from 49% in 1998 to more than 70% in mid-2001. A study by Dao (2001) indicates that if households demand credit, they first apply for loans from the formal sector (e.g., government banks), largely because interest rates are subsidised and thus lower than in the informal sector. However, for many reasons, households choose to borrow from the informal sector at much higher interest rates. They are either those who are completely excluded from the formal sector or those being rationed in the amount of credit. A number of households borrow from their relatives and friends at zero-interest rates, but these households have been excluded from the analysis of credit rationing by formal lenders.

Table 6b. Results from Second Stage Least Squares: Impacts of Credit on Household Welfare..

Variable	Per-Capita Expenditure		Per-Capita Food Expenditure		Per-Capita Non-Food Expenditure	
	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
AGE98	0.177633	7.306821*	0.141211	6.645651*	0.236982	6.203212*
AGE98*AGE98	–0.011968	–4.495937*	–0.010793	–4.638587*	–0.013962	–3.337507*
EDUCYR98	0.021521	11.73443*	0.011561	7.211788*	0.035329	12.25802*
FARM98	–0.023968	–1.597689	–0.024622	–1.877764**	–0.021334	–0.904948
GENDER98	0.001698	0.114598	0.042384	3.272195*	–0.057059	–2.450155*
HHSIZE	–0.102083	–27.05984*	–0.095099	–28.84122*	–0.115973	–19.56257*
LGLAND980	–0.011821	–5.475450*	–0.005308	–2.813256*	–0.019447	–5.732373*
LGFISA980	0.058729	22.25537*	0.041436	17.96455*	0.086300	20.81076*
LGNFSA980	0.045339	23.76919*	0.025533	15.31461*	0.077134	25.73254*
LGDETE98	0.005053	0.288457	0.025555	1.668933**	–0.032365	–1.175645
LGFSOU98	0.063933	4.294735*	0.048672	3.740697*	0.093392	3.992248*
LGNOO98	0.081608	1.738382**	0.101111	2.464200*	–0.042754	–0.579544
LGPORK98	0.406621	8.407764*	0.296651	7.017768*	0.520518	6.848926*
LGRICE98	0.210225	4.321962*	0.247643	5.824863*	0.204924	2.680927*
LGSEW98	0.070426	2.987775*	0.007520	0.365022	0.162953	4.399208*
EDUYR98C	0.011397	2.747349*	0.010979	3.027804*	0.020441	3.135507*
LGLAN98C	0.058936	4.704746*	0.065031	5.939285*	0.063567	3.229086*
RCPIGS98	–1.925638	–12.36355*	–1.486674	–10.92062*	–2.830734	–11.56548*
WTTOCREDIT	0.058897	10.76278*	0.031550	6.596244*	0.114328	13.29480*
RESIDTOBIT1	–0.051599	–9.149071*	–0.029587	–6.002171*	–0.098780	–11.14564*
C	6.471063	31.34931*	6.224408	34.49953*	5.165934	15.92564*
F-statistic	184.2145		128.1238		162.6414	
Prob(*F*-statistic)	0.000000		0.000000		0.000000	
Adjusted *R*-squared	0.471941		0.382760		0.440870	
Total observations	4,101		4,101		4,101	

*Significant at 5% level.
**Significant at 10% level.

For those who receive loans from formal sources, the amount of credit that they may receive is affected by various factors, of which education, household savings, the availability of credit and the area devoted to farming are important. Apart from the availability of credit, education, household savings and farming area all represent the wealth of households. The results thus indicate that formal lenders tend to provide more credit to households that are better off. Similarly, we found that households with higher educational standards, higher savings and higher productivity of land are more likely to receive loans. This again strengthens the hypothesis that formal credit is for wealthier rural households and that formal lenders are most willing to grant loans to those who are better off. Interestingly, we have found that for households who are being rationed in the amount of credit, the quota system in credit allocation is the key factor and this seems to prove the case of VBARD.

This analysis has also demonstrated that credit has a positive effect on household welfare as represented by per capita expenditure (food/non-food). Although the effect is small, it does contribute to the notion that access to credit may be an essential tool for poverty reduction in rural areas. It also raises the issue of the cost-effectiveness of this approach to poverty reduction. It may be that a policy better aimed at the poor is required.

Since the government of Vietnam is committed to providing credit to rural households as a key component of its strategy for rural development and poverty reduction (Dao, 2002), the policy implications drawn from the findings in this paper are as follows: First, given the effect of farming area and its productivity on household formal credit, land reforms should be accelerated. Many provinces have not yet finished the issuance of LUCs (Dao, 2002) and thus rural households may find it hard to gain access to formal credit as LUCs can be used as collateral. Second, the importance of the availability of credit at the village and commune levels indicates that the government should encourage the expansion of bank branch networks. Although interest rates in the banking sector are gradually being liberalised, the requirement to charge centrally determined interest rates plus a small margin (0.3% and 0.5% per month for short-term and medium-/long-term loans, respectively (Dao, 2002)), remains a constraint on banks' ability to cover lending costs and to develop lending at risk-premium based rates. Thus, a further liberalisation of interest rates could create more incentives for banks (VBARD, VBP) and induce more efficient lending. Third, better-off households seem to benefit more from formal credit. In order to ensure that poorer households gain access to formal credit, the applicant-screening process should not be based on criteria representing a household's wealth.

More emphasis should, for example, be placed on business plans, pre- and post-loan training and group borrowing. Last but not least, using local information obtained from NGOs and other social organisations could be a good policy, but it may raise the danger of delinquency because the rotating system of lending employed by these organisations may hide the nature of repayment.

NOTES

1. According to the CGAP, formal providers are sometimes defined as those that are subject not only to general laws but also to specific banking regulation and supervision (development banks, savings and postal banks, commercial banks, and non-bank financial intermediaries). Formal providers may also be any registered legal organisations offering any kind of financial services. Semi-formal providers are registered entities subject to general and commercial laws but are not usually under bank regulation and supervision (financial NGOs, credit unions and cooperatives). Informal providers are non-registered groups such as rotating savings and credit associations (ROSCAs) and self-help groups.
2. See for examples Khandker (1998), , Remenyi and Quinones (2000), Wright (2000), Khandker (2001), Coleman (2002), Pham and Izumita (2002), Khandker and Faruqee (2003), Quach, Mullineux, and Murinde (2003), etc.
3. We include the semi-formal sector in formal sector, and thus the formal sector includes banks, credit and savings institutions, microfinance programs by NGOs, national programs, etc. The informal sector includes loans from relatives, friends, revolving credit associations, etc.
4. See for examples McCarty (2001), Quach (2002), Dao (2002), Pham and Izumita (2002), and Quach et al. (2003).
5. An LUC allows households to manage and use their farming land for farm production and it can be transferred. It is not a certificate of possession.
6. M. H. Quach participated in this survey as a team leader, conducting household interviews and processing data in 15 selected provinces across the country from May to July 2001.
7. It is described as a small group of people, each of whom borrows money from a bank. The bank does not require collateral because the borrowers are relatively poor and do not own much property. Instead, the bank requires group members to be jointly liable for each other's loans – that is, if a member defaults on a loan, the rest of the group is liable for the remainder of the loan. If the group does not honour this joint obligation, then the entire group is cut off from future access to credit.
8. We imply both production and consumption. However, we assume that formal credit is mainly for the purpose of small business and farm production.
9. Including outstanding loans and loans already paid within 12 months.
10. Calculated as the ratio of (total low-income households receiving loans $\times$ amount of loan granted) over (total low income households $\times$ amount of loan requested) (Dao, 2002).

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THEME 3: CORPORATE FINANCING AND FINANCIAL MARKETS

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THE IMPLICATIONS OF THE 'ONE SIZE FITS ALL' MICROFINANCE LENDING MODEL ON ENTERPRISE FORMATION AND GROWTH: AN ANALYSIS OF THE LIQUIDITY PROBLEMS OF MICROENTERPRISES

Patrick Ryan

ABSTRACT

Despite the apparent recent success of microfinance institutions in emerging economies, certain categories of micro and small enterprises are still unable to gain adequate access to credit. The evidence from a study of microenterprises in Uganda, suggests that the inflexible nature of financial product design is inappropriate for certain categories of enterprises because it does not address their complex liquidity problems. Entrepreneurs who do not have an existing enterprise or other sources of income, encounter significant liquidity problems when trying to establish a new enterprise or expand an existing one. Financial services should be more appropriately tailored to cashflow requirements of the enterprise.

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1. INTRODUCTION

The contention of this paper is that despite the apparent success of microfinance institutions (MFIs) and the efforts of earlier supply-led policies and financial liberalisation, the conundrum of how to provide the diverse and complex Micro and Small Enterprise (MSE) sector with sustained access to appropriate credit facilities remains. It argues that there are still important 'gaps' in the credit market and that certain types of enterprises and categories of entrepreneurs are still unable to gain adequate access to credit, even from the new generation of MFIs that have emerged during the past 20 years.

One factor that may explain why attempts to improve access to credit have met with limited success is the failure to understand fully the nature of liquidity problems facing MSEs. This has contributed to the failure to design effective programmes and products within an appropriate institutional framework that meet these liquidity needs. The purpose of this paper is to explore the nature of liquidity problems facing MSEs in order to develop our understanding of the complex cashflow problems they face. This analysis will be used to determine the extent to which these problems and needs are adequately catered for by the range of financial services available to entrepreneurs from MFIs.

2. MICRO AND SMALL ENTERPRISE IN AFRICA

The importance of the MSE sector to the economic and social development of Africa is well recognised.[1] A study of five sub-Saharan countries estimated that MSEs employed 22 per cent of the adult working population, compared to 15 per cent in the formal sector (Daniels, 1994; Daniels & Fisseha, 1992; Daniels and Ngwira, 1992; Fisseha, 1991; McPherson, 1995). A nationwide survey of Kenya in 1995 found that 33 per cent of all working people were employed in the MSE sector, which also contributed 13 per cent to Gross Domestic Product (Daniels, 1999).

This important contribution to informal employment explains why MSE promotion has become a prominent component of development policy in Africa. Other reasons include its potential contribution to providing a seedbed for industrialisation, economic growth and entrepreneurship development (Grosh & Somolekae, 1996; McPherson, 1996; Mead, 1994; Levy, 1991). More recently, its potential in supporting poverty-focused development strategies has been recognised (Department for International Development [DFID], 2000).

However, despite numerous policy initiatives, the growth of the sector in Africa has been disappointing.[2] In a study of Botswana, Kenya, Malawi, Swaziland and Zimbabwe, Mead (1994) found that most firms started with one to four employees and never expanded, and that less than 1 per cent grew to above 10 employees. A study of 116 firms in Nigeria over a 30-year period found that only two of the 21 firms that originally had fewer than 10 employees graduated above that number (Kilby, 1993). The absence of a significant graduation has led to a situation where there are numerous MSEs and a few medium to large firms in Africa, a phenomenon often referred to as the 'missing middle' (World Bank, 1989).

A number of factors have contributed to the failure of larger enterprises to emerge from the MSE sector. These include poor infrastructure, weak entrepreneurial and management skills and inadequate access to machinery and materials (Levy, 1991; Schmitz, 1992; Steel & Webster, 1991). It is generally recognised that inadequate access to credit and other financial services from formal financial institutions is a constraint on the expansion of the MSE sector. Formal financial institutions find lending to MSEs risky, costly and unprofitable (Nikoi, 1995). As a result, MSEs still rely heavily on the family and informal moneylenders for sources of finance (Buckley, 1997).

Attempts to address this problem have passed through several recognisable stages. The emphasis on the state-led expansion of subsidised credit during the 1960s and 1970s was followed by financial liberalisation and the withdrawal of the state in the 1980s (Aryeetey & Nissanke, 1998; Steel, Aryeetey, Hettige, & Nissanke, 1997). During the 1990s, there was rapid expansion of the microfinance movement, based on the group lending methodology. This approach appeared to address many of the problems of supply-led lending to MSE associated with high transaction costs, risk, low repayment rates and poor targeting and sustainability. For many, the 'new world of microfinance' had the potential to provide access to credit to the poor on a massive scale, doing to finance what the green revolution had done to agriculture (Otero & Rhyne, 1992). It should be noted, however, that this methodology, based on group lending and peer pressure, is clearly less appropriate for larger and more formal small and medium enterprise lending and agriculture, which were areas targeted by subsidised credit and financial liberalisation.

Despite the apparent recent success of MFIs, there remain important 'gaps' in the credit market, and certain types of enterprises and categories of entrepreneurs are still unable to gain adequate access to credit facilities, even from the new generation of MFIs. This view is supported by evidence that many MFIs are experiencing significant drop-out rates and the exclusion and self-exclusion of elements of the target population. Drop-out rates of between 11 and 15 per cent were reported in surveys of BRAC membership in Bangladesh (Evans, Adams, Mohammed, & Norris, 1999; Wright, 2000). Similar problems relating to drop-outs were reported in a study of the Kenya Rural Enterprise Programme (K-REP) (Bird & Ryan, 1998). A study of access to credit conducted by Hashemi (1997) in an area where the Grameen Bank and BRAC were active found that only 57 per cent of eligible households had joined a group.

One of the causes of exclusion and high drop-out rates is risk aversion relating to fears about being unable to repay the loan resulting in the loss of family possessions. There are also issues around an unwillingness or inability to attend weekly meetings, a reluctance to guarantee other peoples' loans and the rejection of the 'poorest of the poor' by wealthier group members (Evans et al., 1999; Hashemi, 1997; Wright, 2000).

Other evidence suggests that the inflexible nature of product design, more specifically the rigidly enforced 'one-size fits all' loan terms and conditions offered by many MFIs, is also an important factor affecting participation and drop-out rates (Wright, 2000). The methodology of many MFIs depends upon offering a few highly standardised products to a membership governed by a rigid set of rules and regulations. This includes weekly meetings, compulsory weekly savings, limits on loan size, weekly repayments and no grace periods. The benefits of this methodology are clear for MFIs in that it facilitates the provision of savings and credit services to a target group in a manner approaching cost recovery and sustainability. However, it is becoming increasingly clear that the inflexibility of the 'one size fits all' methodology employed by many MFIs is inappropriate for many potential beneficiaries (Meyer, 2002). In particular, as the subsequent analysis will show, it does not address the liquidity needs of certain types of MSEs, particularly during the start-up and expansion stage.

3. BACKGROUND TO THE STUDY

The study focuses on several members of a group of entrepreneurs in the Jinja District of Uganda who are engaged in the production of Waragi, a crude spirit made from molasses. The entrepreneurs are also members of the Foundation for International Community Banking (FINCA), a non-profit-making MFI.[3] The study analyses enterprise profitability and liquidity in order to ascertain whether FINCA's savings and lending criteria, including the requirements and constraints of group membership, are adequate to meet the specific financing needs and business cycle of this activity.

The process of producing Waragi has two main stages. Firstly, a mixture of molasses and water is fermented for 3 days to produce a beer-like substance. The Waragi spirit is then distilled from the alcohol by boiling for approximately three hours.[4] Sales are made to individual customers who pay in cash, or to local trade stores, bars and restaurants in larger quantities on a credit sales basis. One of the main attractions of the activity is that it has the potential to provide a regular flow of cash income in a region where the main source of income is the seasonal production of smallholder coffee and cotton.

FINCA is one of the few sources of non-family group finance for entrepreneurs in the district. Each group normally consists of between 30 and 40 women who are required to meet weekly. Groups are required to establish an executive committee of at least six members and adhere to written by-laws. In order to qualify for membership, a woman must have an on-going business from which she earns money on a daily, or at least a weekly basis. The other group members must guarantee loans to individuals and they should not currently be borrowing from any other organisation (FINCA, 2001).

The most common types of enterprise financed by FINCA are retail stores and traders who are mainly engaged in the processing and sale of charcoal, tomatoes, bread, groundnuts and fish. Finance is also provided for other business activities including restaurants, kiosks, tailoring, poultry, grain milling, hair salons, handicrafts, brick-making and brewing. Credit is designed to build capital and to sustain the growth of the business rather than to establish new business (FINCA, 2001). The analysis presented in this paper will demonstrate why MFI services, contrary to common perception, are generally not appropriate for use in starting new businesses. K-REP, for example, and Pride in Uganda specifically exclude start-up lending (Bird & Ryan, 1998; SUFFICE, 2001). This exclusion of start-ups significantly limits the ability of microfinance to reach lower income groups who do not own an existing enterprise.

Initial loan sizes range from Ushs. 50 to 200,000 depending on the economic activity of the area. A 16-week loan cycle is used during which members meet weekly to repay their loans. A cost recovering interest rate of 4 per cent per month is charged. All subsequent loans are based on the size and performance of the initial loan, the level of savings and a client rating system.

Each member is required to save at least 10 per cent of any loan. This is facilitated by compulsory weekly savings of at least Ushs. 1,250. Voluntary savings above the required level are also encouraged. Savings are managed by the group but are kept in the group's commercial bank account and may not be withdrawn until a member leaves the programme, but members do have access to their voluntary savings (FINCA, 2001; SUFFICE, 2001).

4. ENTERPRISE PROFITABILITY AND LIQUIDITY

The purpose of the financial analysis presented in this section is to establish whether distilling Waragi is a profitable activity and that resulting cashflows are sufficient to maintain liquidity under different scenarios. A successful enterprise must be both profitable and liquid.[5] However, it is perhaps not widely appreciated that liquidity, more than profitability, is one of the main constraints on growth and cause of enterprise failure in high- and low-income economies (Storey, 1994).

The three main scenarios analysed are summarised in Table 1. Scenario 1 assesses the profitability of distilling Waragi for an existing enterprise.

Table 1. Summary of Different Scenarios Analysed and Assumptions Employed.

Scenario	Enterprise Type	Assumptions
Scenario 1	Existing enterprise	20 litres per week 100% Cash sales No outstanding loan
Scenario 2a	Start-up enterprise (cash sales)	Purchase fixed assets Ushs. 123,000 Owners equity available 30% Loan required Ushs. 100,000 100% Cash sales
Scenario 2b	Start-up enterprise (75% credit sales)	Purchase fixed assets Ushs. 123,000 Owners equity available 30% Loan required Ushs. 100,000 25% Cash sales/75% Credit sales
Scenario 3	Expand existing business (credit sales)	From 20 to 40 litres Existing sales 100% cash New order 100% credit sales Purchase fixed assets Ushs. 123,000 Owners equity available 30%

In Scenario 2, the analysis is extended to consider the problems of starting an enterprise using the financial services available from FINCA. This section will examine the feasibility of the activity under two conditions: cash sales (2a) and credit sales (2b). Scenario 3 examines the feasibility of financing expansion.

The assumptions employed for each scenario are summarised in Table 1. The key variables are the level of production, cash or credit sales, owner's equity and the loan terms. Certain common assumptions have been employed for all scenarios including the fact that FINCA is the only source of non-family finance available; that the owner does not pay herself a salary and that unpaid family labour is used for certain aspects of the process. All scenarios assume the use of a family bicycle for the transport of materials and the finished product.

Scenario 1: Existing Enterprise

A Profit and Loss Account for the production of 20 litres, the amount produced by one firing, is presented in Table 2.[6] It shows that the production of 20 litres of Waragi generates a net profit of Ushs. 5,900 (US$ 3.30).[7] Over the 16-week period of a FINCA loan, a profit of Ushs. 94,400 (US$ 53)

Table 2. - Scenario 1: Existing Enterprise – Net Profit Calculation (Ushs. '000.).

	Production of 20 Litres Per Week	Production of 320 Litres 16 weeks
Revenue		
Sales of waragi	20	320
Variable production costs		
Molasses	10	160
Firewood	2	32
Labour	1.2	19.2
Total variable costs	13.2	211.2
gross profit	6.8	108.8
Less expenses		
Salary	0	0
Miscellaneous	0.5	8
Depreciation	0.4	6.4
Total expenses	0.90	14.4
Net profit	5.90	94.4
Net profit to sales ratio	29.5%	

can be realised (Table 2), giving a net profit to sales ratio of 29.5 per cent. Thus, at the lowest level of production, Waragi can generate a profit and a regular additional source of household income. Net profit increases to Ushs. 7,100 per week if family labour is used for transporting water (36 per cent profit/sales ratio). An established enterprise would normally produce more than one firing per week. At 40 litres per week, a profit of Ushs. 11,800 would be made.

This level of profit is very sensitive to the assumption of employing family labour with a low opportunity cost. Casual labour rates in Jinja at the time of the study were approximately Ushs. 3,000 per day. The estimated amount of owner's time actually spent on the process in 1 week is two full days, spread over 4 days. This gives a total cost of labour of Ushs. 6,000, which makes the activity unprofitable. If the costs of bottling and packaging Waragi were also included, the activity would become extremely unprofitable at this level of production and a far greater volume of production would be required to maintain profitability. Expanding production to this level is extremely difficult due to the problems of operating in the saturated local Waragi market. This is a problem faced by many small producers in emerging economies (see Dawson, 1997).

In terms of liquidity, a 16-week cashflow for Scenario 1 is presented in Table A1. The enterprise is comfortably liquid as indicated by the fact that both the net and cumulative cashflow are continuously positive. One would expect this kind of unproblematic result from a small, profitable enterprise based on cash sales with no outstanding debts. Provided the level of entrepreneur drawings is appropriate to maintain working capital and replace fixed assets, the enterprise will be able to continue trading.

Scenario 2: Start-Up Enterprise

In Scenario 2, the analysis is extended to consider the feasibility of starting a new enterprise with a FINCA loan. The estimated total capital cost is Ushs. 123,000 (see Table 3). The total amount of working capital required to purchase materials and labour for the initial production in Week 1 is approximately Ushs. 14,000, giving a total project cost of Ushs. 137,000.[8] This is financed by a FINCA loan of Ushs. 100,000 and Ushs. 37,000 of owner's equity.

A standard FINCA loan is re-paid over 16 weeks at an interest rate of 4 per cent per month, with no grace period.[9] This gives a weekly loan repayment of Ushs. 7,250 and a weekly interest charge of Ushs. 1,000.[10] This

Table 3. Waragi Distilling Enterprise – Total Investment Cost.

Details	Ushs.
Capital costs	
Firing drum	35,000
Plastic fermentation drum (× 2)	50,000
Copper piping	30,000
Jerry cans (× 4)	8,000
	123,000
Working capital	14,000
Total project cost	137,000
Less owners equity (25 %)	37,000
Loan finance required	100,000

reduces the profit on the production of 20 litres to Ushs. 4,900 per week (25 per cent net profit/sales ratio). However, enterprise liquidity is more problematic under Scenario 2a, which assumes that sales are made on a cash basis (see Table A2). Given the production process takes 4 to 5 days, it is assumed that only Ushs. 5,000 (25 per cent) will be sold in the remaining 2 days of the first week. It is also assumed that the FINCA loan is received on the first day of Week 1 and the first repayment of Ushs. 7,250 is made on the first day of the following week.

Under these conditions, the enterprise is not liquid (Table A2). The net weekly cash outflow from Week 2 is Ushs. 950 and although the cumulative cashflow is positive in Weeks 1–4, this is only because of the working capital from the owner's equity. The liquidity position is even more constrained if the cash outflow of compulsory weekly savings of Ushs. 1,250 is taken into account. Furthermore, FINCA's requirement to save 10 per cent of any loan amount means the entrepreneur would be required to have saved an extra Ushs. 10,000. This requirement, which has been adopted by many MFIs, represents a considerable barrier to entry for low-income people (see Alamghir, 1997, as cited by Hashemi, 1997).

The liquidity situation deteriorates further under Scenario 2b (Table A3), which assumes that 75 per cent of sales are made on 30-day credit terms. In this situation, the receipt of 75 per cent of sales revenue relating to Week 1 is delayed until Week 5 resulting in severe cashflow problems during the first month of the project. In reality, the terms of credit sales can be extended to as long as 60 –90 days, either by agreement or by default on the part of the buyer, and very often payment is received only after much valuable entrepreneurial time has been spent chasing the creditor. The problem is compounded if a proportion of these debts ultimately become bad.

In a commercial lending situation, this problem could be offset by negotiating a grace period or a longer loan repayment period. This is not possible in this situation given FINCA's 16-week cycle with no grace period. Borrowing for longer periods at the high interest rates charged by FINCA is ill advised, in that the increased interest charges would make the activity unprofitable. However, the liquidity problems encountered in Scenario 2a (Table A2) could be solved by extending the loan period to 24 months giving a weekly repayment rate of Ushs. 4,833 and a net cashflow in a normal week of Ushs. 1,417 without reducing profitability to a critical level. This example shows that the rate of interest is not so crucial when borrowing small amounts (Ushs. 200,000 = US$ 112) for a small number of weeks. It also supports the view that access to finance, and the timing of loan inflows and outflows, is more important than the cost of credit. This point goes some way in explaining the enduring benefits of using informal moneylenders as a source of finance in emerging economies.

A larger enterprise would also have more room to manoeuvre in this situation by negotiating suppliers' credit for the purchase of material inputs. However, MSEs have little power in the market place to bargain for better sales or purchasing credit terms. In addition, they do not have the resources, or sufficiently large production runs, to justify making the bulk purchases necessary to persuade suppliers to give credit. Even if suppliers' credit were available, small producers do not have the transport and storage facilities to manage large purchases of stock.

Liquidity problems of this nature are more acute for enterprises with longer production periods. For example, it may take several weeks or months for a carpenter or a tailor to complete an order for a school. This extends the period between purchasing materials and receiving payment considerably, especially if the client is a slow-paying government department.

Scenario 3: Expanding Existing Business

Under Scenario 3, the key issue of expansion is considered. In this situation an existing enterprise, with no outstanding debts, producing 20 litres per week on a cash sales basis, receives an order for an additional 20 litres per week from a local bar or trade store on a 30-day credit basis. Assuming the new order is not based on a discounted price and including interest rate charges, the net

Table 4. Scenario 3: Expansion to 40 Litres Per Week – Net Profit Calculation (Ushs. '000.).

	Production of 40 Litres Per Week	Production of 640 Litres 16 Weeks
Revenue		
Sales of waragi	40	640
Variable production costs		
Molasses	20	320
Firewood	4	64
Labour	2.4	38
Total variable costs	26.4	422.4
Gross profit	13.6	217.6
Less expenses		
Salary	0	0
Miscellaneous	1	16
Depreciation	0.8	12.8
Loan interest	1	16.0
Total expenses	2.80	44.8
Net profit	10.8	172.8
Net profit to sales ratio	27%	

profit of the enterprise will be Ushs. 10,800 per week and Ushs. 172,800 over the 16-week period (27 per cent net profit/sales ratio) (Table 4).

Although profitable, liquidity problems in Scenario 3 are acute (Table A4). This assumes a new order is received in Week 3 and production is increased in Week 4. Expansion is financed by the owner's equity of Ushs. 30,000 (plus the cash balance of Ushs. 18,900 available at the end of Week 3) and a loan from FINCA of Ushs. 100,000. New capital equipment totalling Ushs. 123,000 is purchased in Week 4. Under this scenario, the volume of production and sales is large enough to generate a positive net cashflow in a normal month's trading (Ushs. 5,800). However, the impact of moving to a more formal trading relationship associated with growth (selling on credit) means that it is 4 weeks before the revenue derived from the new order is received. This fact, combined with the absence of a grace period, results in serious liquidity pressures from Weeks 5–11.

5. PRINCIPAL FINDINGS

The analysis has shown that Waragi enterprises are profitable at a low level of production, a finding consistent with the large number of Waragi producers in the region. However, the level of profitability depends upon using family labour and limiting the use of packaging. Over short periods, profitability is not particularly sensitive to borrowing small amounts at high interest rates.

In terms of liquidity, an established, debt-free enterprise can provide a weekly cash income, which is important in an area dominated by seasonal agricultural production. However, the analysis clearly demonstrates that entrepreneurs without equity levels above 30 per cent experience significant liquidity problems in establishing a new enterprise or expanding an existing one using the inflexible financial products offered by FINCA. Compulsory weekly savings aggravate the liquidity position further in marginal situations.

The analysis has shown that the key source of MSE liquidity problems is selling on credit terms and the absence of suppliers' credit, combined with the inflexible savings and loan package offered by FINCA. These factors, together with the length of the production period, the size of any new order and the seasonal availability of inputs, combine to produce extremely irregular and unpredictable cashflows, which makes MSE liquidity extremely difficult to manage. The Waragi producers studied in this paper did not face particularly unusual or complex cashflows compared to other types of enterprise, and yet they still faced serious growth and expansion constraining liquidity problems.[11]

The entrepreneurs interviewed confirmed that loan terms based on weekly repayments with no grace periods made it difficult to manage liquidity and to finance new orders. In response, some entrepreneurs only accepted cash sales, which limited the opportunities for expansion. Others accepted credit orders because they had other sources of income. In such cases, loans were viewed as an additional source of capital to expand an existing business, and initial repayments were made from other sources (SUFFICE, 2001). Entrepreneurs also complained that high interest rates meant that their businesses were less profitable. Though obviously true, the evidence of this research suggests that high interest rates on small loans over short time periods are not such a critical constraint compared to liquidity.

The fact that the MSEs in the district studied were experiencing problems is supported by the evidence of the high drop-out rates of group members (SUFFICE, 2001). The entrepreneurs interviewed confirmed the fact that the services were not compatible with all types of products and that those who wanted larger loans were often forced to leave FINCA. Other problems cited by members included too much committee work and the fact that small savers and borrowers had to guarantee the larger loans of more established members. Interestingly, many entrepreneurs did not mind forced saving, which fostered discipline and placed the money out of the reach of other family members (SUFFICE, 2001; Personal Interviews, 2001).

This study confirms that microfinance can be effective in providing an additional source of loan finance to an entrepreneur with an existing business, based on cash sales, who also has an additional source of income. However, the study has shown that the methodology is not appropriate for many types of business and income groups. This supports the contention of this paper that significant gaps still exist in the credit market for important segments of the MSE sector. It also raises questions about the ability of microfinance to contribute to poverty reduction strategies by reaching the 'poorest of the poor' with credit for starting new income generating activities.

For MSE lending to be effective, the savings and credit products available must be flexible enough to meet the complex liquidity needs of individual enterprises. It is important that the design of services should be based more on the needs of the cashflow of the enterprise and not solely on rules and regulations of compartmentalised institutions in a fragmented financial market. The results of this study suggest that the key issues of loan size, timing and availability of funds, flexibility of terms and conditions, and the range of services available should be considered if more effective financial services for MSEs are to be designed.

To meet adequately the credit needs of production lending, the size of the loan must be based on an accurate assessment of the total investment cost, including working capital.[12] The problem with microfinance for production lending is that the size of the loan is not derived from an analysis of the needs of the business but on fixed borrowing limits based on the position of an entrepreneur in the group loan cycle, the length of membership, the level of compulsory savings and on whose turn it is. In FINCA, the amount you can borrow is limited to Ushs. 50,000, Ushs. 175,000 or Ushs. 200,000.

Furthermore, MFIs do not assist members in appraising their businesses. Appraising individual loans is costly and this screening function is performed by the groups during weekly meetings in order to reduce the MFI's transaction costs in the process. However, the result is that when making a loan, MFIs do not actually know if an enterprise is viable or if the investment costs have been fully funded by a particular loan. This does not necessarily matter if the loan is to an established middle-income entrepreneur with an existing business, since the money is being used to supplement several other sources of finance. However, it is a more suspect *leap of faith* to make for start-up enterprises owned by inexperienced entrepreneurs from low-income groups, a fact that partly explains self-exclusion and why many MFIs are reluctant (and unable) to finance start-up enterprises.

The implications of insufficient or partial funding are that some enterprises will fail, causing drop-outs and indebtedness, and others will not be able to start, causing non-participation. It also means that successful entrepreneurs who require larger loans to finance business expansion, may be forced to leave and seek other sources of finance. In this context, MFIs should consider offering individual loans for larger and more established clients with good repayment rates. It is unhelpful and unnecessary for entrepreneurs in this category to be bound so tightly by the restriction of group lending and peer pressure. This finding is also supported by the work of Sinha and Matin (1998) and Meyer (2002).

Managing the timing of enterprise cash inflows and outflows is the most important element in liquidity management. The cashflow analysis should be used to determine how much is needed; when it is needed; over what period the loan can be repaid and when the first repayment can be made. As we have seen, the grace period is a key factor in attempting to ameliorate the negative impact of reduced cash inflows early in the enterprise's life due to credit sales and the gradual build-up of production and market size.

However, grace periods are not available to the clients of many MFIs, which, as is evident from the analysis presented in Scenarios 2 and 3, leads to cashflow problems for start-ups and expansion unless other sources of finance are available. This problem is particularly acute when funding activities with longer production cycles and illustrates why the products of many MFIs are only suitable for enterprises with short production cycles and cash sales.

However, the lending methodology is justified by MFIs in that it supports the overriding concern for the maintenance of repayment discipline, even though it limits participation to enterprises that generate income on a weekly basis. Weekly repayments are also important to enable MFIs to identify small defaulters after a week, as opposed to larger bad debts after a month. As a result, many MFIs, while acknowledging the problem, argue that clients should either accept the product or exclude themselves if their business is not suited to the services available (FINCA, 2001; SUFFICE, 2001). Wright (2000) observes that in Bangladesh many group members have businesses that do not produce regular income streams that correspond to the weekly repayment schedule. He notes that some entrepreneurs make repayments from other sources of family income not associated with the investment. The key point is that different types of enterprises would be better served with different types of loans in terms of size, the length of the repayment period and an appropriate grace period.

The analysis presented in this paper has also illustrated that enterprises need credit on a continuous basis to finance the gap between production and receipt of sales, to finance new orders, to cover short-term liquidity problems caused by disruptions in production and to replace fixed assets. However, in FINCA, as in many other MFIs, repeat loans are not available until the first loan has been repaid, and members are not allowed to borrow from other sources.

The fact that enterprises need a continuous supply of credit and do not become self-sufficient in the medium term, explains why it is normal for many formal sector small to medium enterprises in countries with more developed financial markets to exist on almost permanent overdrafts. This fact does not appear to be widely recognised in the design of programmes to support MSEs, and the expectation of many in the development community seems to be that businesses can become self-sustaining after only one or two loans. The problem for MSEs operating in shallow, fragmented financial markets is that they do not have access to more than one institution, or to one type of product, and certainly not to overdraft facilities.

MSEs need to access a broader range of complementary financial services in order to be as successful as their counterparts in more developed financial markets are. To access a broader range of complementary financial services, MSEs would, in a more developed financial market, have access to more than one institution. Entrepreneurs often face partial access to one institution and one type of product during a specific period without access to repeat loans, overdrafts or other services. As we have seen, FINCA members are actually prohibited from borrowing from other sources, presumably to ensure that members do not become over indebted. However, this leads to the liquidity constraints identified in the analysis.

6. CONCLUSIONS

This paper has argued that despite the apparent success of MFIs during the 1990s, certain types of enterprises and categories of entrepreneurs are still unable to gain adequate access to appropriate credit facilities. The evidence presented suggests that one of the causes of this is that the inflexible nature of product design offered by many MFIs is inappropriate for many potential beneficiaries.

The paper demonstrated that one of the key reasons why this inflexible lending methodology is inappropriate is because it does not meet the needs of the complex liquidity problems facing certain types of MSEs. In particular, the analysis shows that those entrepreneurs without existing enterprises or other sources of income, encountered significant liquidity problems when trying to establish a new enterprise or expand an existing one using the inflexible financial products offered by FINCA.

The study found that, in addition to the inflexible savings and loan package offered by FINCA, the main causes of MSE liquidity problems were the level of credit sales, the absence of suppliers' credit, the length of the production period, the size of new orders and the seasonal availability of inputs. These problems combined to produce extremely irregular and unpredictable cashflows that made many MSEs extremely difficult to manage.

To assist MSEs to cope with these problems, the design of financial services must be more tailored to the needs of the cashflow of the enterprise and not so much to the rigid rules and regulations of financial institutions. The paper identified several guiding principles to inform the design of financial products that adequately meet the needs of MSEs. These include the consideration of the appropriate loan size, the timing and availability of funds, the flexibility of terms and conditions, and the range of services available.

It is fully recognised that elements of the methodology criticised in this paper underpin many aspects of MFIs' success in providing financial services to a previously disenfranchised group on a more sustainable basis. Individual institutions cannot be expected to meet all the financial needs of the diverse MSE sector. Serving a particular niche of existing entrepreneurs drawn from the middle to upper poor-income groups is an important function to perform. This role is even more valid if one accepts the argument that financing existing middle–poor entrepreneurs, rather than start-ups from the poorest of the poor, is likely to be a more effective use of scarce resources and will lead to the generation of higher levels of employment and income growth. What is more important, however, is the recognition that the approach is not a panacea for production lending or poverty alleviation. This is because it necessarily excludes by design, significant segments of the target population including start-up enterprises, certain types of products and the poorest of the poor.

NOTES

1. The term MSE in developing countries covers a wide range of business activities and a broad spectrum of size. The categorisation used by the UK Government's

Department for International Development (DFID, 2000) provides a useful basis for understanding the diversity of activities embraced by the term. This includes Survival (<1 employee), Household (1+), Microenterprise (<5), small emergent (<25) and growth businesses (<100). The enterprises referred to in this study fall mainly into the household and micro category, although the liquidity problems discussed apply to small emergent enterprises as well.

2. Key policy initiatives include the introduction of various financial policies and credit programmes to improve the access of MSEs to financial services (for a discussion of early initiatives, see Helmsing & Kolstee, 1993). At the enterprise level, instruments have focussed on improving infrastructure, access to technology and the provision of business development services, including the provision of training and technical assistance (Dawson, 1997; Gibson, 1997).

3. FINCA was established in Uganda in 1992 to provide savings and credit facilities to low-income women, who would not otherwise have access to such services from formal institutions. By 2000, 804 groups serving more than 23,000 women in 20 districts had been opened (FINCA, 2001).

4. The distillation process involves boiling off the alcohol in a sealed drum. The vapour passes out of the drum through a copper pipe, which is cooled as it passes through a cold water tank or drum. The alcohol vapour cools, condenses and drops of Waragi emerge from the pipe and are collected in a container. This process requires a constant supply of cool water, which means that the water has to be regularly changed, or that the distillery is situated on the banks of a small stream. The process can be repeated if a stronger, often more dangerous, spirit is required. There are various types of Waragi depending on whether other ingredients, such as bananas or certain vegetables, are added at the fermentation stage.

5. It is quite feasible for a profitable enterprise to fail because of poor liquidity, and for a liquid business to continue trading even though it is unprofitable. As a result, financial analysis must determine that both are adequate.

6. Costing data: The sales price of Waragi is Ushs. 1,000 per litre; the cost of molasses is Ushs. 10,000 per production of 20 litres; the cost of firewood per firing is approximately Ushs. 2,000; the labour cost of transporting water is approximately Ushs. 50 per jerry can × 24 journeys = Ushs. 1,200; estimate of miscellaneous expenses is Ushs. 500; estimate of depreciation on total fixed assets of approximately Ushs. 123,000 is Ushs. 400 per week.

7. The exchange rate as of May 2001 was Ushs. 1,783 per US$ 1.

8. It is assumed that no replacement of assets will be required during the 16-week period except for jerry cans, some of which are likely to be lost or damaged and will need to be replaced.

9. The way FINCA's loan interest charge of 4 per cent per month is applied is the equivalent of an Annual Percentage Rate (APR) of 106 per cent.

10. FINCA's calculation of weekly loan repayments and interest charges on a loan Ushs. 100,000 @ 4 per cent = Ushs. 4,000 × 4 = Ushs. 16,000/16 weeks = Ushs. 1,000 per week interest charges. Total repayments Ushs. 116,000/16 = Ushs. 7,250. Charges are simply double for a loan of Ushs. 200,000.

11. For many MSEs, even with cash sales, the problem is more complex due to the irregular cashflows resulting from the seasonal supply of materials such as groundnuts and sunflower seeds for the production of cooking oil.

12. During the supply-led era, poor appraisals meant working capital needs were often not adequately assessed. This often resulted in the enterprise running out of money early in the life of the business. It also meant that the owner could not make the necessary repayments on time. In addition, many supply-led institutions invariably did not have the procedures to approve additional cash quickly enough to meet the client's additional needs, due to the lead-time required to approve loans.

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APPENDIX

Table A1. Waragi Distilling Enterprise – Scenario 1 – Existing Business – 20 Litres Per Week – 100% Cash Sales – 16 Week Cashflow Analysis – (Ushs. '000).

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Inflow																	
Owners equity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sales – waragi	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	320
Loan receipts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total inflow	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	320
Outflow																	
Capital costs																	
Drum – firing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plastic drum – fermenting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Copper piping	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jerry cans	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
Direct production costs																	
Molasses	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	160.0
Firewood	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	32.0
Labour	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	19.2
Overhead costs																	
Salary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	8.0
Other outflows																	
Loan repayments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Total outflow	13.7	13.7	13.7	13.7	13.7	13.7	13.7	17.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	223.2
Net cashflow	6.3	6.3	6.3	6.3	6.3	6.3	6.3	2.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	96.8

Cumulative cashflow	6.3	12.6	18.9	25.2	31.5	37.8	44.1	46.4	52.7	59.0	65.3	71.6	77.9	84.2	90.5	96.8

Note: The following assumptions were used: (1) Existing on-going business; (2) cash sales 100% – 25% received in Week 1; (3) no outstanding loans; (4) use of family labour for certain tasks – owner's salary, marketing and transport (bicycle); (5) replacement of drum every 100 firings, replacement of 50% of jerry cans every 8 weeks; (6) excludes compulsory savings cash outflow of Ushs. 1,250 per week.

Table A2. Waragi Distilling Enterprise – Scenario 2a – Start-Up Enterprise – 20 Litres Per Week – 100% Cash Sales – 16 Week Cashflow Analysis – (Ushs. '000).

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Inflow																	
Equity	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
Sales – waragi	5	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	305
Loan	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
Total inflow	142	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	442
Outflow																	
Capital costs																	
Drum – firing	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35
Plastic drum (x2) – fermenting	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
Copper piping	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
Jerry cans	8	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	12
Direct production costs																	
Molasses	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	160
Firewood	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	32
Labour	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	19
Overhead costs																	
Salary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	8
Other outflows																	
Loan repayments	0.00	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	109

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Total outflow	136.70	20.95	20.95	20.95	20.95	20.95	20.95	24.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	454.95
Net cashflow	5.3	–0.95	–0.95	–0.95	–0.95	–0.95	–0.95	–4.95	–0.95	–0.95	–0.95	–0.95	–0.95	–0.95	–0.95	–0.95	–12.95
Cumulative cashflow	5.3	4.35	3.4	2.45	1.5	0.55	–0.40	–5.35	–6.3	–7.25	–8.2	–9.15	–10.10	–11.05	–12.00	–12.95	

Note: The following assumptions were used: (1) Start-Up business; (2) cash sales 100%; (3) new loan – Ushs. 100,000 over 16 weeks; (4) equity contribution Ushs. 50,000 (33% of total project cost of Ushs. 150,000); (5) use of family labour for certain tasks – owner's salary, marketing and transport (bicycle); (6) replacement of drum every 100 firings, replacement of 50% of jerry cans every 8 weeks; (7) excludes compulsory savings cash outflow of Ushs. 1,250 per week.

Table A3. Waragi Distilling Enterprise – Scenario 2b: Start-up Enterprise – 20 Litres Per Week – 75% Credit Sales – 16 Week Cashflow Analysis (Ushs. '000).

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Inflow																	
Owners equity	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
Sales – waragi	5	5	5	5	20	20	20	20	20	20	20	20	20	20	20	20	260
Loan receipts	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
Total inflow	155	5	5	5	20	20	20	20	20	20	20	20	20	20	20	20	410
Outflow																	
Capital costs																	
Drum – firing	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35
Plastic drum (x2) – fermenting	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
Copper piping	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
Jerry cans	8	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	12
Direct production costs																	
Molasses	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	160
Firewood	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	32
Labour	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	19
Overhead costs																	
Salary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Miscellaneous	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	8
Other outflows																	
Loan repayments	0.00	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	109
Total outflow	136.70	20.95	20.95	20.95	20.95	20.95	20.95	24.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	454.95
Net cashflow	18.30	–15.95	–15.95	–15.95	–0.95	–0.95	–0.95	–4.95	–0.95	–0.95	–0.95	–0.95	–0.95	–0.95	–0.95	–0.95	–44.95
Cumulative cashflow	18.30	2.35	–13.60	–29.55	–30.50	–31.45	–32.40	–37.35	–38.30	–39.25	–40.20	–41.15	–42.10	–43.05	–44.00	–44.95	

Note: The following assumptions were used: (1) Start-Up business; (2) cash sales 25%; (3) new loan Ushs. 100,000 over 16 weeks; (4) equity contribution Ushs. 50,000 (33% of total project cost of Ushs. 150,000); (5) use of family labour for certain tasks – owner's salary, marketing and transport (bicycle); (6) replacement of drum every 100 firings, replacement of 50% of jerry cans every 8 weeks; (7) excludes compulsory savings cash outflow of Ushs. 1,250 per week.

Table A4. Waragi Distilling Enterprise – Scenario 3 – Expansion – 20 to 40 Litres Per Week – New Order 100% Credit Sales – 16 Week Cashflow Analysis – (Ushs. '000).

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Inflow																	
Owners equity	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	30
Sales – waragi	20	20	20	20	20	20	20	40	40	40	40	40	40	40	40	40	500
Loan receipts	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	100
Total inflow	20	20	20	150	20	20	20	40	40	40	40	40	40	40	40	40	630
Outflow																	
Capital costs																	
Drum – firing	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	35
Plastic drum – fermenting	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	50
Copper piping	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	30
Jerry cans	0	0	0	8	0	0	0	0	0	0	4	0	0	0	0	0	12
Direct production costs																	
Molasses	10	10	10	20	20	20	20	20	20	20	20	20	20	20	20	20	290.0
Firewood	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	58.0

Labour	1.2	1.2	1.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	34.8
Overhead costs																	
Salary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	8.0
Other outflows																	
Loan repayments	0.00	0.00	0.00	0.00	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	87
Total outflow	13.70	13.70	13.70	149.90	34.15	34.15	34.15	34.15	34.15	34.15	38.15	34.15	34.15	34.15	34.15	34.15	604.80
Net cashflow	6.30	6.30	6.30	0.10	–14.15	–14.15	–14.15	5.85	5.85	5.85	1.85	5.85	5.85	5.85	5.85	5.85	25.20
Cumulative cashflow	6.30	12.60	18.90	19.00	4.85	–9.30	–23.45	–17.60	–11.75	–5.90	–4.05	1.80	7.65	13.50	19.35	25.20	

Note: The following assumptions were used: (1) Expansion business – 20 to 40 litres per week; (2) cash sales 100%; (3) new loan – Ushs. 100,000 over 16 weeks; (4) equity contribution Ushs.40,000 (33% of total project cost of Ushs. 123,000); (5) use of family labour for certain tasks – owner's salary, marketing and transport (bicycle); (6) replacement of drum every 100 firings, replacement of 50% of jerry cans every 8 weeks; (7) excludes compulsory savings cash outflow of Ushs. 1,250 per week.

PREDICTION OF CORPORATE FINANCIAL DISTRESS: EVIDENCE FROM MALAYSIAN LISTED FIRMS DURING THE ASIAN FINANCIAL CRISIS

Yusuf Karbhari and Zulkarnain Muhamad Sori

ABSTRACT

The aims of this study are twofold: to formulate a model that predicts corporate financial distress and to apply the model to trace the potential failure of Malaysian financially distressed firms due to the Asian Financial Crisis of 1997. The model successfully predicts firm's health at the rate of 88%. The predictive accuracy of the model reveals that it was significantly better than chance.

1. INTRODUCTION

Prediction of corporate financial distress has long been the object of study of corporate finance literature. Since the seminal work of Altman (1968), numerous researchers have attempted to improve on and replicate such studies

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in capital markets worldwide (see, for example, Altman, 1968; Altman, Haldeman, & Narayanan, 1977; Deakin, 1972; Ginoglou, Agorastos, & Hatzigagios 2002; Taffler, 1984; Theodossiou, 1993; Zavgren, 1985). However, in the context of emerging economies, this topic has received much less attention mainly due to the short history of financial markets in emerging economies. Although corporate failures are perceived to be a problem of developed economic environments (Altman, Baidya, & Dias, 1979), firms operating in emerging economies are no exception.

The motivation to undertake this study was provided following the many corporate failures in the Malaysian capital market in the last decade. Ferri, Hahm and Bongini (1998) report that the problems of corporate financial structures in East Asian corporations (including Malaysia) have been an important factor in contributing to the East Asian Financial Crisis and leading many corporations to bankruptcy. Therefore, there is a need to develop a model to assess the financial health of firms in a Malaysian context. The research findings from developed economies are not suitable to apply to Malaysian firms due to the differences in market structures; socio-economic factors, provision and implementation of law, the political environment and accounting standards in these economies, which result in differences in financial reporting (Her & Choe, 1999).

This study describes the development of a model for prediction of corporate distress and provides evidence on financial structures faced by Malaysian firms that triggered and aggravated the East Asian Financial Crisis. The validation procedure provides evidence to support the notion that those symptoms of crisis were already in existence long before the crisis.

In Malaysia, firms are deemed to be under financial distress when they apply to the relevant authorities requesting the restructuring of their organisations based on a scheme of arrangement pursuant to Sections 176–178 of the Malaysian Companies Act, 1965. Firms under protection of this provision have to formulate survival options, including proposals on strategies for corporate rescues and reconstruction.[1] Highly leveraged corporations with severe financial problems might resort to outright liquidation.[2] In light of the above, the objective of this study is to develop a model that is able to discriminate between distressed and non-distressed Malaysian firms. These attributes could well provide an important insight for policymakers and to financial institutions to guide them to devise effective pre-emptive measures to mitigate corporate failure.

The paper is organised into five sections. The following section offers a critique of the multiple discriminant analysis (MDA) model and failure prediction model. Section 3 provides the data collection and research methodology. The fourth section presents the results and a discussion of the

Table 1. List of Ratios Examined.

Code	Ratio Name	Code	Ratio Name
V01	Cash flow to sales	V34	Sales growth
V02	Cash flow to assets	V35	Depreciation growth
V03	Cash flow to net worth	V36	Dividend growth
V04	Cash flow to total debt	V37	Return on opening equity (ROOE)
V05	Return on sales (ROS)	V38	Percentage change in ROOE
V06	Percentage change in ROS	V39	Equity to debt
V07	Return on assets	V40	Percentage change in equity to debt
V08	Return on equity	V41	Equity to long-term debt
V09	Net income to total debt	V42	Percentage change in equity to long term debt
V10	Current liabilities to total assets	V43	Equity to fixed assets
V11	Long–term liabilities to total assets	V44	Percentage change in equity to fixed assets
V12	Total liabilities to total assets	V45	Times interest earned
V13	Cash to total assets	V46	Percentage change in times interest earned
V14	Quick assets to total assets	V47	Profit before depreciation to sales
V15	Current assets to total assets	V48	Percentage change in profit before depreciation to sales
V16	Working capital to total assets	V49	Pre-tax income to sales
V17	Cash to current liabilities	V50	Percentage change in pre-tax income to sales
V18	Quick ratio	V51	Sales to inventory
V19	Percentage change in quick ratio	V52	Percentage change in sales to inventory
V20	Current ratio	V53	Sales to fixed assets
V21	Percentage change in current ratio	V54	Percentage change in total assets
V22	Cash turnover	V55	Percentage change in working capital to total assets
V23	Receivable turnover	V56	Operating income to assets
V24	Quick asset turnover	V57	Percentage change in operating income to asset
V25	Current asset turnover	V58	Percentage change in long-term debt
V26	Working capital turnover	V59	Dividends to cash flows
V27	Percentage change in sales to working capital	V60	Net income to cash flow
V28	Net worth to sales	V61	Operating profit to sales
V29	Asset turnover	V62	Return on owners equity
V30	Percentage change in sales to total assets	V63	Total assets to net worth
V31	Days sales in receivable	V64	Earning power
V32	Inventory to total assets		
V33	Inventory growth		

research findings. The final section provides conclusions of the study, its implications and suggestions for future research.

2. CRITICISMS OF THE MDA AND FAILURE PREDICTION MODELS

The use of MDA in business failure prediction studies has been widely accepted since its use by Altman (1968). Despite its success, criticisms were made regarding the statistical procedures employed. For example, the application of linear MDA was not preceded by tests to determine its optimality in most financial studies (Joy & Tollefson, 1975). Karels and Prakash (1987) stressed that MDA procedure will be optimal only if the normality conditions are met; otherwise, the conclusions derived are suspect. They conducted a study with the aim of investigating whether or not the financial ratios used in previous studies satisfy the normality conditions required by the MDA technique. Fifty financial ratios were tested. Only nine of the ratios were found normal and six ratios found lognormal. These ratios were then used to construct an MDA model. The model developed correctly classified 98% of the non-bankrupt group and 100% of the bankrupt group. They concluded that no matter how complicated the procedures used were, they do not necessarily provide better results if the ratios used depart from the normality assumptions. The problem of the lack of normality assumption can be reduced through transformation of financial ratios (Hair, Anderson, Tetham, & Black, 1995) as carried out by Altman et al. (1977) in developing their ZETA model.

Furthermore, a time "bias" might have been incorporated into the classic business failure model, most of which was developed between the late 1960s and the 1980s. Begley, Ming and Watts (1995) studied the issue of time bias by applying the Altman (1968) and Ohlson (1980) model to a matched sample of failed and non-failed firms from the 1980s. They found that predictive accuracy was significantly reduced when applied to the 1980s data. Begley et al. (1995) stated that the models were inappropriate for time frames different from those in which the model was developed.

3. DATA COLLECTION AND METHODOLOGY

The aims of our study are twofold. First, we aim to develop a model that identifies financially distressed firms using data from 1990 to 1996. Second, we extend our model to a sample of firms during the Asian Financial Crisis to ascertain the signs of distress before the crisis. The data used in this study are a set of financial ratios derived from financial statements of a sample of failed listed companies for the period from 1990 to 1996. The above cut-off period was selected due to the financial crisis experienced by Asian countries between 1997 and 2000 when stock markets in the region were badly affected. This study only focuses on corporate financial distress for the period before the Asian Financial Crisis due to the following reasons. First, the associations of abnormal returns to 'unexpected' information components of accounting data are sensitive to the business cycle (Lev & Thiagarajan, 1993). Second, risk premiums are not stationary across business cycles (Gooding & O'Malley, 1977; Krueger & Johnson 1990; Wiggens, 1992) and subsequently; accounting data have been shown to be associated with variations in risk premiums (Beaver, Kettler, & Scholes, 1969). Therefore, firms from the crisis period were omitted from the sample.

The sample companies used in this study were selected from firms that were listed in the Kuala Lumpur Stock Exchange (KLSE) between 1990 and 1996. During this period, the KLSE was ranked as one of the largest stock exchanges in Asia with a market capitalisation of RM464.99 billion at the end of 2001 compared with RM444.35 billion in the previous year. Also, the total number of companies that are listed on the KLSE has increased significantly since its incorporation in 1973 with 262 companies as compared with 621 in 1996 and 812 in December 2001. A paired sample design technique was employed, where each failed firm has a non-failed 'match' in the sample for the same period.

In our study, listed firms that meet the criteria in any one or a combination of situations mentioned below are classified as distressed firms. The definition of distress was taken from the firms that were protected under Section 176 of the Malaysian Companies Act, 1965, between 1990 and 1996.

Thirty-three distressed firms were thus sampled and matched with 33 non-distressed firms, which were randomly selected and were based on the following criteria:

1. Same industry as the failed firm
2. Closest asset size
3. Similar age since incorporation

The above criteria were set as control factors to ensure minimum bias in the selection of the control sample used in the development of the failure prediction model.

We identified the distressed firms from information contained in the KLSE daily diary for the years under study. Each firm listed on the KLSE is required to announce immediately any information related to their companies as prescribed by the KLSE listing requirement. Information on the distressed firms that announced their financial status was obtained by examining these documents for the period under study on a daily basis. After obtaining the names and related information of the distressed firms, the financial information of these firms was obtained from the annual financial statements published for 5 years prior to distress. The collected financial statements were then grouped according to the year before distress.

Our sample companies emanate from six different industrial groupings. Twenty-three companies are from the industrial sector, six companies from the property sector, and a company each from the consumer, finance, hotel and mining sectors. Due to the limited sample size for each industry and the fact that Malaysia is regarded as an emerging market with a short history, the number of failed companies among publicly listed firms is small. Therefore, the analysis focuses on the mixed industry as, it is impractical to analyse each sector of industry.

The dependent variable is a dichotomous variable of distressed or non-distressed firms. The independent variables are the 64 selected financial ratios used by Beaver (1966), Altman (1968) and Ou & Penman (1989). as provided in Table 1.

4. RESULTS AND DISCUSSIONS

4.1. Estimation of Discriminant Model

Using a sample of distressed and non-distressed firms as the dependent variable and the ratios as the independent variables, a forward stepwise MDA was used to ascertain the discriminating power of the variables. In stepwise estimation, independent variables were entered into the discriminant function one at a time on the basis of their discriminating power. The normal variables were entered into the discriminant analysis.[3] Three groups of prospective variables were tested.[4] Finally, one group that gives the highest hit ratio was selected. The Mahalanobis D^2 measure was used to select variables that produce the greatest separation for the pair of groups, which are closest at a particular step (Hair et al., 1995). This process begins with all the variables excluded from the model and chooses the variable that maximises the Mahalanobis distance between the groups. The F test was used as an additional means of interpreting the relative discriminating power of the independent variables.

Table 2. Summary of Interpretative Measures.

Variable	Standard Weights Value	Discriminant Loading		*F* Ratio	
		Value	Rank	Value	Rank
V11	NI	0.208358	4	NI	NI
V12	0.9501	0.780804	1	177.7349	1
V13	0.243088	−0.131900	7	47.46414	5
V15	NI	0.047853	8	NI	NI
V29	−0.642206	−0.196509	5	109.4794	2
V32	0.621284	0.283862	3	78.45759	3
V51	0.478912	−0.295212	2	63.16183	4
V53	NI	−0.135180	6	NI	NI

Note: NI denotes not included. Using *F* ratio, it is identified that V11, V15 and V53 have minimal discriminatory power and therefore they were not included in the analysis.

Table 2 provides the statistical results of the MDA where the significant variables were determined and ranked accordingly. Using stepwise procedure, the significant variables were identified as in Table 2, since this procedure prevents the non-significant variables from entering the function. From the discriminant loadings and univariate F values, the ranking of discriminating power of variables were identified. In the five variables function, total liabilities to total assets discriminated the most with the highest discriminant loading and F statistics, and cash to total assets discriminating the least. The finding reveals that the liabilities and assets of distressed firms are important financial indicators, which allow us to discriminate between distressed and non-distressed firms. Table 2 above provides the ranking of each variable in the function and among all variables tested. The procedure identified that long-term liabilities to total assets, current assets to total assets and sales to fixed assets were not strong enough to discriminate between the two groups; therefore, we omitted those variables from further analysis.

The final estimated function derived from the analysis is as follows: $Z = 1.795 + 1.538X_1 – 2.185X_2 + 3.646X_3 + 0.282X_4 + 0.104X_5$, where $Z =$ overall index; $X_1 =$ total liabilities to total assets (log); $X_2 =$ asset turnover (square root); $X_3 =$ inventory to total assets; $X_4 =$ sales to inventory (log); $X_5 =$ cash to total assets (log).

The results of our analysis shows that the non-distressed group centroid (dependent variable [DV] = 0) is at −1.107 and the distress group (DV = 1) centroid is at 1.107 that independently classify distress and non-distressed firms. To make our analysis more meaningful, a single cutting score was calculated. The cutting score of the function equals to zero, which was calculated on the

Table 3. Comparison of Classification Accuracy.

Group	Correct Classification (%)	Mis-classification (%)
Panel A: Analysis Sample		
0	86.2	13.8
1	89.9	10.1
Average	88.1	11.9
Panel B: Hold-Out Procedure		
0	94	6
1	88	12
Average	91	9
Panel C: Cross-Validated Procedure		
0	85.3	14.7
1	88.1	11.9
Average	86.7	13.3

average values of both centroids. The procedure for classifying firms is as follows: (1) classify a firm as a distress firm if its discriminant score has a positive value, and (2) classify a firm as a non-distress firm if its discriminant score has a negative value. The assessment of the predictive accuracy of the discriminant function using classification matrices is summarised in Table 3. The model classification accuracy is 88.1% (average of correct classification of DV = 0 at 86.2% and DV = 1 at 89.9%) on the analysis sample and the holdout sample accuracy rate at 91% (average of correct classification of DV = 0 at 94% and DV = 1 at 88%). In the cross-validation tests, the classification accuracy marginally declined to 86.7% (average of correct classification of DV = 0 at 85.3% and DV = 1 at 88.1%). The superior model's accuracy rate achieved in this study implies that it has potential for application in the real world.

Five variables were found to significantly discriminate between distressed and non-distressed firms in the MDA, namely, Total liabilities to total assets, asset turnover, inventory to total assets, sales to inventory and cash to total assets. All these significant variables explain the vulnerabilities of Malaysian firms that resulted in financial difficulties for them during the Asian Financial Crisis.

4.2. External Validation

Before making any generalisations, the model was tested for external validity. Under this test, we introduced 43 firms as a new sample, which consisted of distressed firms during the Asian Financial Crisis. As Lehman

(1991) points out, 'Internal validity asks whether an experiment's conclusion is warranted. External validity, on the other hand, asks whether the results of an experiment can be generalised beyond the specific situation'.

In this procedure, it was found that the model correctly classified the entire new sample as distressed firms in their respective distress years, and also a year before the actual distress (refer to Table 4, Panel A). In the 2-year period before the distress year, 86% of the new sample was found to have experienced distress and the balance was misclassified. The prediction

Table 4. External Validation Procedure.

Panel A: Accuracy Rate

Distress Year (DY)	Correct Classification (%)	Misclassification (%)
DY	100	0
1 year before DY	100	0
2 years before DY	86	14
3 years before DY	70	30
4 years before DY	54	47
5 years before DY	42	58

Panel B: Detailed Analysis of Accuracy Rate of Validation Procedures (%)

Range of Z-Score	Description	DY	1	2	3	4	5
> 1.106	Distress	79	47	26	12	7	7
$1.106 > X > 0$	Grey–distress	21	53	60	58	46	35
$0 > X > -1.106$	Grey–non-distress	0	0	12	28	40	44
$-1.106 > X$	Non–distress	0	0	2	2	7	14
Total	100	100	100	100	100	100	100

Panel C: Detailed Analysis of Accuracy Rate of Validation Procedures (Frequency)

Range of Z-Score	Description	DY	1	2	3	4	5
> 1.106	Distress	33	20	11	5	3	3
$1.106 > X > 0$	Grey–distress	9	23	26	25	20	15
$0 > X > -1.106$	Grey–non-Distress	0	0	5	12	17	19
$-1.106 > X$	Non-distress	0	0	1	1	3	6
Total	42	43	43	43	43	43	43

Note: There are missing data for distressed year (DY) resulting in the total sample being reduced to 42 firms.

accuracy rate increases as it nears distress year. In this case, actual distress increased from 42%, 54% and 70%, respectively, up to 1997.

The above findings provide evidence that the model predicts distress better than chance and has the potential to be applied in practice. The model's accuracy rate is consistently above 50%, as far as 4 years before the actual distress event. This is consistent with the actual performance achieved in the analysis sample and cross-validation procedures as provided in Table 4.

Interestingly, we found an area where the Z-score for both distressed and non-distress firms overlap. This is referred to by Altman (1968) as the 'zone of ignorance'. Many prediction studies refer to this area as a 'grey area', where the distributions of distress and non-distress overlap. To interpret the Z-scores more meaningfully, researchers generate a cut off point to separate the Z-scores for both groups. In our study, the centroid for distress firms is –1.107 and non-distress firm is 1.107 and any Z-score between these two centroids falls into the grey area. The overlap area is one where the distressed and non-distressed firm's financial characteristics cluster together. In reality, this area is where the transition period of non-distressed firms becoming failures or vice versa occurs. Furthermore, we have calculated and identified the cutting score at 0 and Z-scores and can be interpreted as; (1) distress: if $Z\text{-scores} > 1.107$, (2) grey area–distress (has a distress criterion but is expected to deteriorate or improve): if $1.107 > Z\text{-score} > 0$, (3) grey area–non-distress (has a non-distress criterion but is expected to improve or deteriorate): if $0 > Z\text{-score} > -1.107$, and (4) non-distress: if $Z\text{-score} < -1.107$. Although we can conclude that a firm is either distressed or non-distressed using the cutting score, it is more meaningful if the firms can be classified into a more detailed financial health group based on Z-scores obtained and our four states of Z-scores above. A detailed analysis of the accuracy rate in the external validation procedure is provided in Panels B and C of Table 4. It can be seen that 14% of the new sample were non-distressed in the 5 years prior to the distress year; deteriorated gradually to 2% in the 2 years before the distress year and were at none in 1 year before the distress year (refer Table 4, Panel B). The Z-score for each of the new samples in the external validation procedures is provided in Table 5 where the Z-score of each firm reveals that their performance deteriorates when approaching the distress year.

To further illustrate the movement of the Z-score from 5 years before the distress year up to the distress year, we extracted the six firms that were identified as non-distressed firms in Table 5 and tabulated this information in Table 6. For example, Company 5 was classified as a non-distressed firm 5 years before distress and gradually deteriorated to the 'grey

Table 5. External Validity.

Company Name	Distress Year	1st Year	2nd Year	3rd Year	4th Year	5th Year
Company 1	2.709	1.431	1.311	0.155	0.099	−0.487
Company 2	3.354	3.104	2.645	0.279	0.148	0.099
Company 3	1.441	3.685	2.824	0.479	0.074	0.407
Company 4	1.560	1.056	0.476	0.536	0.041	−0.109
Company 5	1.869	1.297	−0.273	−0.084	−1.032	−1.399
Company 6	0.769	0.205	0.153	0.044	0.309	−1.032
Company 7	2.895	1.762	0.011	−0.136	−0.781	−1.711
Company 8	n. a.	3.098	3.124	1.608	0.619	−0.053
Company 9	2.645	1.369	0.528	0.310	−0.085	−0.569
Company 10	1.599	0.400	0.446	0.259	0.224	0.052
Company 11	2.831	1.915	1.978	2.421	2.097	1.737
Company 12	5.018	3.516	2.881	2.102	0.819	0.818
Company 13	1.018	0.359	0.552	0.581	0.044	0.573
Company 14	1.070	0.885	0.356	−0.056	−0.099	−0.036
Company 15	2.071	1.068	0.603	0.377	−0.259	0.139
Company 16	0.746	0.284	0.244	−0.369	−0.311	−0.609
Company 17	0.918	0.374	0.094	0.023	0.233	0.399
Company 18	3.267	2.194	0.842	0.648	0.801	0.717
Company 19	1.272	1.122	1.065	1.092	0.949	0.318
Company 20	1.327	1.592	1.033	0.529	−1.251	−1.084
Company 21	0.802	0.456	−0.074	−0.908	−0.669	−0.597
Company 22	2.620	2.280	1.055	−0.016	−3.593	−4.725
Company 23	3.343	2.209	1.488	1.479	1.486	1.367
Company 24	3.219	2.514	0.889	0.185	−0.492	−0.596
Company 25	2.403	2.255	1.094	0.544	−0.016	−3.402
Company 26	2.161	0.629	0.699	−0.199	−1.532	−1.111
Company 27	2.251	1.807	1.311	−2.012	−0.660	−2.052
Company 28	6.998	5.319	4.084	0.115	0.389	0.203
Company 29	0.879	0.693	0.378	0.244	−0.378	−0.492
Company 30	1.671	0.700	−1.149	−0.848	−0.860	−1.065
Company 31	1.029	0.900	0.706	0.895	0.429	0.324
Company 32	0.593	0.115	−0.005	−0.391	−0.479	−0.657
Company 33	1.385	0.932	0.379	−0.127	−0.234	2.062
Company 34	1.147	0.995	−0.752	0.568	0.297	0.220
Company 35	2.496	0.578	0.489	0.393	0.123	0.293
Company 36	1.448	0.185	−0.441	−0.425	−0.472	−0.426
Company 37	1.520	0.669	0.078	0.618	0.568	0.922
Company 38	1.164	0.651	0.386	0.140	−0.486	−0.518
Company 39	2.612	1.515	0.605	0.554	0.568	0.699
Company 40	1.356	0.555	2.126	1.756	1.145	−0.299
Company 41	2.951	2.927	2.093	0.875	0.113	−0.874
Company 42	1.366	1.075	0.547	0.364	0.482	−0.311
Company 43	1.519	0.662	0.260	−0.054	−0.114	−0.292

Note: n.a. denotes that the respective data are not available for analysis.

Table 6. Extract Sample from the Validation Procedure.

Company Name		Failure Year	1st Year	2nd Year	3rd Year	4th Year	5th Year
	Status	D	D	GD	GND	GND	ND
Company 5		1.869	1.297	−0.273	−0.084	−1.032	−1.399
	Status	D	D	GD	GND	GND	ND
Company 7		2.895	1.762	0.011	−0.136	−0.781	−1.711
	Status	D	D	GD	GND	ND	ND
Company 22		2.620	2.280	1.055	−0.016	−3.593	−4.725
	Status	D	D	GD	GD	GND	ND
Company 25		2.403	2.255	1.094	0.544	−0.016	−3.402
	Status	D	GD	GD	GND	ND	ND
Company 26		2.161	0.629	0.699	−0.199	−1.532	−1.111
	Status	D	D	D	ND	GND	ND
Company 27		2.251	1.807	1.311	−2.012	−0.660	−2.052

Note: D denotes distress;
GD denotes grey area–distress;
GND denotes grey area–non-distress;
ND denotes non-distress.

area–non-distress' in years 3 and 4 before distress, and subsequently to 'grey area–distress' 2 years before distress, and finally to 'distress' in the distress year. It was found that the same trend applied to the other four firms. Therefore, it is important to identify firms in the grey or overlapping area ($-1.1065 < Z$-score< 1.1065) in applying this model. Early remedial action could be taken for firms that are suspected to be in a distressed or grey area if detected in advance using our model. Failure could be prevented and much public money could be saved if the firms' health could be assessed and distress symptoms could be detected at an early stage.

We also found that the distressed firms that were used in our external validation procedures (Table 4, Panels B and C) showed distress symptoms as early as 5 years before the distress year. Our finding is consistent with Nam and Jinn (2000), who claimed that the crisis of 1997 was not just a temporary foreign exchange crisis but also the result from poor performance of Malaysian firms over a long period.

4.3. Testing Relationships between the Final Variables in the Model, and Profit and Cash Flow Variables

In the model development process, prime variables such as assets, liabilities, equity, sales and expenses were considered for inclusion in the model. Whereas variables that have potential negative values like profit, cash flow and working capital were omitted due to the requirements of the transformation techniques (to normalise the variables) that only use variables with positive values. In an attempt to provide fair treatment to all classes of financial ratios and to avoid confusion among users of accounting information who often use cash flow, profit, working capital and net worth variables in their analysis, additional analysis was undertaken to determine whether the final variables selected in the prediction model have any relationship with the above-mentioned variables (i.e. cash flows, profits, working capital and net worth). A correlation test was employed to investigate this relationship and the results are summarised below in Table 7.

Table 7 indicates a strong relationship between the final variables and cash flow, profit, working capital and net worth variables. For example,

Table 7. Pearson Correlation Test.

Profit and Cash Flow Variables	Final Variable in Prediction Model					
	V12	V13	V29	V32	V51	V65
V01	−0.585*	−0.043	0.097	0.122	0.048	0.040
V02	−0.716*	−0.031	0.247	0.187	0.060	−0.012
V03	0.002	0.010	−0.010	−0.056	0.008	0.006
V04	−0.148*	0.358*	0.216*	−0.034	0.073	0.161*
V05	−0.565*	−0.038	0.099	0.125	0.049	0.040
V06	0.056	0.029	−0.078	−0.079	−0.001	0.007
V07	−0.712*	−0.026	0.216*	0.171*	0.059	−0.009
V09	−0.132	0.377*	0.184*	−0.035	0.062	0.182*
V16	−0.997*	−0.095	0.124	0.161*	0.053	0.039
V26	−0.043	−0.049	0.217*	0.116	−0.036	0.045
V27	0.104	0.065	0.096	0.087	0.001	−0.018
V28	−0.643*	−0.058	0.087	0.117	0.045	0.038
V37	−0.111	0.171*	0.361*	0.086	0.058	0.099
V38	0.010	0.032	−0.051	−0.032	0.009	0.013
V47	−0.585*	−0.043	0.097	0.122	0.048	0.040
V48	0.104	0.006	−0.088	−0.111	−0.042	−0.007
V49	−0.565*	−0.038	0.099	0.125	0.049	0.040
V50	0.056	0.029	−0.078	−0.079	−0.001	0.007
V56	−0.198*	0.041	0.191*	0.130	0.034	−0.044
V57	−0.031	−0.051	0.031	0.039	0.042	0.014
V59	−0.103	0.088	0.134	0.085	0.035	−0.004
V60	0.021	−0.002	−0.021	0.010	0.005	0.015
V61	−0.056	0.123	0.090	0.079	0.045	0.078
V62	−0.029	0.028	0.060	0.131	0.038	−0.008
V63	0.001	0.004	0.004	−0.025	0.004	0.003
V64	−0.698*	0.107	0.086	0.086	0.036	0.081

*Significant at 1%.

total liabilities to total assets (V12) has a significant relationship at the 1% level with cash flow to sales (V01), cash flow to assets (V02), cash flow to total debt (V04), return on assets (V07), working capital to total assets (V16), net worth to sales (V28), profit before depreciation to sales (V47), pre-tax income to sales (V49), operating income to asset (V56) and earning power (V64). In other words, V12 is the proxy and is considered to be representative of the variables mentioned above. The other variables in the final model also have a significant relationship with cash flow, profit, working capital and the net worth variables.

This significant correlation suggests that the variables selected in the final model are a good proxy for the commonly used variables utilised by investors to evaluate the financial health of firms.

5. CONCLUSION

The prediction of corporate distress is a common issue in developed economies but has only recently emerged in less-developed economies such as Malaysia. Since the initial work of Altman (1968), numerous studies have attempted to improve on and replicate the model in different capital markets worldwide. However, this topic has been less well researched in emerging markets due to several major impediments; one of which being the short history of emerging markets. Therefore, this study is important to stakeholders because the issue of prediction of corporate failure from the Malaysian firms' perspectives was revealed.

A model of prediction of corporate distress for Malaysian companies was successfully developed in this study. The model was tested for its predictive accuracy and subjected to both the internal and the external validity tests. The model shows exceptional performance with high correct classification accuracy rate (more than 80%) both in internal and external validity, and showed great potential for predicting firms' distress. A prediction accuracy of 88% was observed in the analysis sample and 87% in the cross-validated procedures. The model performance was further tested in external validation, where 43 new distress firms from the Asian Financial Crisis period were introduced. Our findings suggest that the models are reliable and have good practical use for making decisions in real markets, as the validation tests showed the model performed better than chance with more than 50% accuracy as far back as 4 years before the distress event. Taking into consideration the grey area discussed in the previous section, the model showed superior performance (i.e., better than chance) in all years and can predict as far as 5 years before the actual distress. In addition, 5 ratios were found to be significant out of the 64 financial ratios used in this study to discriminate between distress and non-distress firms. The significant variables are ranked in descending order of their discriminating power. These are

1. Total liabilities to total assets (V12)
2. Asset turnover (V29)
3. Inventory to total assets (V32)
4. Sales to inventory (V51)
5. Cash to total assets (V13)

We found that distress symptoms were in existence long before the Asian Financial Crisis in 1997 and concluded that if those symptoms could have been detected earlier, the impact of the crisis might have been minimal and much public money could have been saved from bailing distressed firms.

This study reported on the existence of four states of a firm's performance as a result of *Z*-score generated by the model, namely, distress, grey area–distress, grey area–non-distress and non-distress. Altman (1968) formerly described the grey area as the 'zone of ignorance'. This area is where firms share distress and non-distress financial characteristics and should be carefully observed before it is too late for any remedial or recovery action.

Finally, a strong relationship was documented between the final variables in the prediction model and the variables most commonly used by investors to evaluate the financial health of firms (namely, cash flow, profits, working capital and net worth). The significant variables mentioned above could guide policymakers or users of the model to develop an early warning system to either evade or mitigate impeding failures. For example, bankers or creditors could use these models to assess the potential borrowers or credit applicant's credit risk. Banks can also, therefore, continuously assess the borrower's financial condition in making decisions to renew or extend loans.

In addition, managers could also adopt such models in their financial planning. If failure can be predicted 3–4 years before a crisis event, management could take remedial action such as a merger exercise or restructuring to avoid potential bankruptcy costs. In particular, such models may be of interest to regulatory bodies such as the Malaysian Securities Commission and the KLSE regulatory board, who might want to assess a firm's going-concern status, solvency and compliance with certain important requirements. This is important, as it allows regulatory bodies to pre-empt any systematic financial failures and bailouts using public funds.

The limitations of this study include the fact that analysis of specific industries was not possible due to a small sample size, and that the cash flow and profitability variable were excluded from further analysis due to transformation problems. Further research is needed that focuses on the above issues on corporate financial distress. Moreover, other methodologies should be used in predicting corporate financial distress such as neural networks and other advanced decision-making techniques that have been claimed by advocates that such methods are more accurate than traditional methods. As a result of the Asian Financial Crisis, there is an urgent need to undertake research to understand the capital structures and other financial indicators such as micro- and macroeconomic variables that might affect a firm's performance, and eventually develop a prediction model for distressed and non-distressed firms. Although this research topic has been well researched, many issues surrounding it have not been settled, and as long as there is a competitive business environment where market discipline ensures the survival of the fittest, this issue will remain unanswered.

NOTES

1. There are a number of corporate restructuring modes that are ruled out by Sections 176–178 of the Malaysian Companies Act, 1965. Among the alternatives that are available are compromise with the creditors and members (Sections 176–177) and facilitation of reconstruction and amalgamations (Section 178).
2. The restructuring alternatives might be taken to mean one of the following: (1) a compromise or arrangement with debenture holders, creditors and shareholders with variation, adjustment or modification of their rights or (2) take over by a new company of the assets of another company with the same persons retaining control.
3. Before the discriminant analysis was performed, all independent variables were subject to a normality test. One variable was found normal, nine variables lognormal and three variables square root normal.
4. A correlation test was performed and it was found that a number of variables highly correlated with each other. Instead of dropping/deleting the highly correlated variables, three potential groups were constructed which exclusively include the highly correlated variables.

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A PORTFOLIO APPROACH TO FIRMS' FINANCING DECISIONS: EVIDENCE FROM INDIA USING THE ALMOST IDEAL DEMAND SYSTEM

Tomoe Moore and Christopher J. Green

ABSTRACT

This paper implements the system approach on firms' financing decisions by analysing portfolio behaviour within a balance sheet framework for Indian non-financial corporations. Firms' decisions are modelled as a co-integrated demand system based on the almost ideal demand system (AIDS) using flow of funds data for the period 1951–1994. The main results are threefold. First, the effects of prices are found to be relatively weak, reflecting the impact of financial repression. Second, evidence reveals that policy variables have a relatively strong impact on firms' capital structure decisions. Third, financial liberalisation is found to be a contributory factor to widening financing opportunities for firms.

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1. INTRODUCTION

The portfolio theory imparts a natural basis for studying demand for financial assets and liabilities. It is argued that firms' financing decisions may be better treated by analogy with portfolio decisions, suggesting a system of demand equations (Chowdhury, Green, & Miles, 1994). The system approach is a methodological improvement over the single equation approach, since it forces the investigator to confront the broader implications of any estimated model (Brainard & Tobin, 1968). It is also pointed out that the system approach with balance sheet constraints allows us to examine the interdependent nature of decisions about one element of the balance sheet with other elements (Hay & Louri, 1991).

Following the seminal work of Brainard and Tobin (1968) on a portfolio balance model, which provided a suitable accounting framework for empirical studies, extensive portfolio literature has been developed for financial institutions. However, the empirical work on the portfolio analysis for corporations is scarce. Notable exceptions are such works as in the following (all for UK firms). In the study of Spies (1974), the components of the capital budget are jointly determined, in which the investment, dividend and financing decisions are tied together by the 'uses equals sources' balance sheet identity. Hay and Louri (1989, 1991, 1996) modelled both assets and liabilities in an attempt to capture the interdependent relationship among the balance sheet items. Taggart (1977) and Chowdhury et al. (1994) focus on modelling financial variables assuming that decisions about real variables are prior. The latter adopts Cuthbertson's (1985) buffer stock approach by analysing the determinants of short-term financial decisions.

This paper proposes and implements the system approach on firms' financing decisions by analysing portfolio behaviour with a balance sheet constraint for Indian non-financial corporations. The empirical focus here will be given explicitly to sources of financing, assuming that an investment decision is independent of a financing decision.

There are a number of contributions in this paper. First, the balance sheet is shaped by aggregate flow data (i.e. time series data) of all non-financial companies in India. This is, to the best of our knowledge, the only comprehensive, sector-specific, flow of funds model for corporations of any developing country. Note that the flow data are annual for the period from 1951 to 1994, and more recent flow of funds data are not available to date. Over the long time span, structural changes are evident in the Indian financial sector, and they are carefully examined in the estimation procedure. Second, cointegration techniques are employed to estimate the long-run model, and an error correction model is specified for the dynamic behaviour. It is a pioneering attempt, but a natural extension given time series data set, to examine the cointegration relationship between the balance sheet items and their determinants for the corporate sector.

Third, the model is more firmly grounded in theory. The almost ideal demand system (AIDS) of Deaton and Muellbauer (1980) is used as the basis for the empirical model. The AIDS facilitates the potential separability of firms' financing and investment decisions. Weak separability is built in utility maximisation, and the hierarchy decision process between the firm's financing and investment is implied in the theoretical framework. This is not inherent in Brainard and Tobin's portfolio balance model in its rather ad hoc framework. Applying the mean-variance (M-V) hypothesis, as implemented in the work by Hay and Louri (1989, 1991, 1996), to the corporate sector may be anomalous. The assumption of a quadratic or a negative exponential utility function may be inappropriate for the behaviour of firms. Also in the M-V approach, the portfolio choice is determined by one-period ahead of expected returns, a risk aversion coefficient and the variance-covariance matrix of returns. This strictly constrains the portfolio behaviour of the firm. Moreover, M-V theory postulates that assets are risky in themselves; however, this study investigates financial liabilities, where there is no risk attached to each liability. The AIDS circumvents these limitations. With the budgetary constraints placed on the liability side of the firm, the firm will take account of the cost of capital by allowing conditional variables to be included as part of a subsistence or baseline level of corporate financing.

This paper seeks to obtain an economically sensible relationship between the financial liabilities and their arguments to understand the determinants of corporate finances for India. We also illustrate the extent to which the AIDS model is robust in modelling firms' financing decisions.

This paper is organised as follows: Section 2 deals with the AIDS and the dynamic error correction model. Section 3 clarifies aggregate balance sheets for the non-financial corporations in India. Section 4 is associated with flow data and explanatory variables used for estimation. The unit root tests are conducted in Section 5. The estimation and results of the long-run and short-run models are presented in Sections 6 and 7, respectively. Section 8 is held for a conclusion.

2. MODEL SPECIFICATION

The AIDS model is characterised as being self-dual, where the primal or the dual can be used equivalently (Deaton & Muellbauer, 1980). This implies that we can think of firms choosing quantities of financial liabilities so as to minimise the total cost of achieving a given level of utility; and this is equivalent to maximising utility, since the budget constraint amounts to the total cost. The AIDS approximates the true cost function by one that is quadratic in the logarithms of prices, and the resulting function is concave, homogeneous of degree one in prices and increasing in utility, being consistent with the axioms of rational choice in demand theory. Following Weale (1986), Barr and Cuthbertson (1991), Adam (1999) and Prasad (2000), we implement the augmented AIDS model by including conditional variables. The AIDS cost function can be written as

$$\ln C(u,p,z) = \alpha_0 + \sum_i \alpha_i \ln p_i + \frac{1}{2}\sum_i \sum_j \gamma_{ij}^* \ln p_i \ln p_j + u\beta_0 \Pi p_i^{\beta i} + (\sum_k \delta_{ik} z_k) \ln p_i \quad (1)$$

where $u =$ utility, $p =$ price, α, γ, β and $\delta =$ parameters and $z_k = k$th conditional variable. The conditional variables are seen as part of the baseline holdings of financial liabilities and determine a minimum quantity of liabilities required by the firm to survive. Shephard's lemma is used to derive the ith liability share equation ($S_i = a_i/W$):

$$S_i = \alpha_i + \sum_j \gamma_{ij} \ln p_j + \beta_i \ln(W/P) + \sum_k \delta_{ik} z_k \quad (2)$$

where $\gamma_{ij} = \frac{1}{2}(\gamma_{ij}^* + \gamma_{ji}^*)$. Rewriting the equation in real terms with time subscript,

$$S_{it} = \alpha_i + \sum_j \gamma_{ij} \ln p_{jt}^\tau + \beta_i \ln(W^\tau/P^\tau)_t + \sum_k \delta_{ik} z_{kt} \quad (3)$$

where $W_t^\tau = W_t/Z_t =$ real wealth at the end of period t, $Z_t =$ good price index, $p_{it}^\tau = [(1 + r_i)(1 - g)]$, $r_i =$ expected nominal return on asset i, between t and t+1, and $g =$ expected rate of goods price inflation, between t and t+1. p_{it}^τ is the real rate of return, being equivalent to the real cost of capital from the firm's point of view. ln P^τ may be interpreted as a composite price. Following Deaton and Muellbauer (1980), we take the Stone index of the form $\ln P^\tau = \sum_i S_i \ln p_i^\tau$. The budget constraint here is that real assets sum to real wealth:

$$\sum_i a_{it}^\tau = W_t^\tau = (W/Z)_t \quad (4)$$

Eq. (3) contains sufficient parameters to be regarded as a first-order approximation to any demand system, and is applied in the current study.

The theoretical restrictions implied on the AIDS parameters are as follows:

$$\sum_{i=1}^{n} \alpha_i = 1, \quad \sum_{i=1}^{n} \gamma_{ij} = 0, \quad \sum_{i=1}^{n} \beta_i = 0 \ \text{and} \ \sum_{i=1}^{n} \delta_{ik} = 0 \tag{5a}$$

$$\sum_{j} \gamma_{ij} = 0 \tag{5b}$$

$$\gamma_{ij} = \gamma_{ji} \tag{5c}$$

Eq. (5a) presents the adding-up restrictions, i.e. $\sum_i S_i = 1$. The restriction of (5b) indicates homogeneity that the shares are homogeneous of degree zero in prices, and (5c) satisfies Slutsky symmetry.

In the AIDS model, the effects of explanatory variables on the dependent variable are measured by elasticities. The elasticities show the responsiveness of the movement of various interest rates on the share of holdings of liabilities in a precise manner, since elasticities vary at each observation. Following Adam (1999), the price, wealth and conditional elasticities for the ith asset are expressed as $E_{ij}(p) = \gamma_{ij}/S_i$, $E_w = \beta_i/S_i + 1$ and $E_z = \delta_i/S_i$, respectively.

For dynamic adjustment, Barr and Cuthbertson (1991) generalised the quadratic cost of the adjustment function of Christofides (1976), and derived so-called error feedback equations. We follow a similar error-correction approach for modelling the dynamic portfolio behaviour of Indian firms. Assuming that all variables are integrated of order one and are cointegrated, the long-run asset demand equation yields super-consistent estimates for $I(1)$ explanatory variables. The residuals from share equations are then substituted in the error correction model. If we let the long-run AIDS model (3) be in a vector notation $S_t = \Pi X_t$, then the model is given by

$$\Delta S_t = \Pi \Delta X_t + L(S - S^*)_{t-1} + \varepsilon_t, \quad \varepsilon_t \sim IID(0, \sigma^2) \tag{6}$$

where $X_t = q \times 1$ vector of independent variables, $\Pi = n \times q$ matrix of parameters, $(S - S^*)_{t-1} = e_{t-1}$: disequilibrium in the level of X in the previous period and $L = n \times (n\text{–}1)$ matrix of parameters. In a system of asset demand equations, if we include only own-lags, then we must implicitly accept that all assets adjust at the same rate (Smith, 1975). To avoid this problem cross-lagged terms are included. Note that since $\sum^{n}(S_i - S_i^*)_{t-1} = 0$, only the ($n$–1) independent disequilibrium shares are required (Anderson & Blundell, 1983).

3. BALANCE SHEET AND FINANCIAL INSTRUMENTS

Table 1 shows the simplified aggregate balance sheet for all non-financial companies, including all non-government public and private companies and branches of foreign companies, based on the flow accounts (Reserve Bank of India Bulletin various issues). The liability side consists of bank loans, bonds, debentures and paid-up capital debt, whereas the asset side consists of inventories, net capital stock and financial assets. This can be rearranged as in Table 2.

Table 2 separates firms' real uses of funds from financing sources. The holdings of loans and advances and company securities in the asset side are netted from the debt and equity capital on the liability side, respectively. The bank loans, bonds and debentures are consolidated to derive total debt financing.[1] The holdings of financial assets are placed on the left-hand side preceded by the negative sign, since the drawing down of the liquid assets is considered
to be a source of funds, implying an internal financing (Taggart, 1977).

It is assumed that a firm decides on its investment and production projects first, and then seeks an optimal financing package. This is perhaps plausible in the context of Indian firms. In India, given the fact that a government project is planned for a fixed period (five years),[2] and the government

Table 1. Aggregate Balance Sheet for the Indian Non-Financial Companies.

Liabilities	Assets
Bank loans	Inventories
Bonds and debentures	Net capital stock (= gross capital stock minus accumulated depreciation)
Paid-up capital	Financial assets (cash, deposits, loans and advances, company securities, provident funds, foreign assets)
Retained earnings[a]	
Trade credit	Trade debt

Sources: Reserve Bank of India (n.d.).
[a]Retained earnings are residual after dividends payout and other claims on profits.

Table 2. Sources and Uses Identity for the Indian Non-Financial Companies.

Financial Items (Sources)	Real Assets (Uses)
Debt (= bank loans + bonds + debentures – loans and advances)	Inventories
	Fixed assets (= net capital stock)
Equity (= paid-up capital + retained earnings – company securities)	
(–) Deposits	
(Trade credit, (−) Cash, (−) Provident funds, (−) Foreign assets, (−) Trade debt)	

frequently intervenes in the economy, an investment decision may be considerably influenced by such a government project. Hence, it is possible that in the long run the firm may be committed to a particular growth path of an investment plan, and other variables are adjusted accordingly (Hay & Louri, 1991). Furthermore, for developing countries in an environment where equity finance tends to be dampened by an under-developed stock market, and debt finance is considerably affected by credit controls, the probability of simultaneous decisions between investment and financing is small.

We seek to explain the composition of financing. Financial instruments to be estimated are, then, *debt, equity* and *deposits*. The transaction of trade credit, trade debt, cash, provident funds and foreign assets are negligible, hence these are treated as exogenous.

4. FLOW OF FUNDS DATA AND EXPLANATORY VARIABLES

The sample period consists of 43 annual observations beginning in 1951–1952 and ending in 1993–1994 with a financial year of from 1 April to 31 March. The financial stock data for the whole time series are not available. Therefore, using the end-of-year stock data of 1950–1951 as benchmark stock,[3] they are constructed by incrementing flow data. The flow data are drawn from a complete and consistent flow of funds matrix, satisfying the zero-row sum for each financial market across disaggregated economic sectors (Backus, Brainard, Smith, & Tobin, 1980; Green, 1984). This

Table 3. The Mean Share of Financial Instruments for the Indian Non-Financial Companies.

	Sources of Finance	Mean Shares (%)
Debt	Bank loans + bonds + debentures−loans and advances	74.5
Equity	Paid-up capital + retained earning−company securities	36
Deposit	(−) Deposits	−10.5
	Real Assets	
Wealth	Inventories and fixed assets	100.0

Notes: The mean shares are based on the sample period 1951–1994.
A negative sign is posted for deposits, as the deposit is an asset.

Table 4. Prices and Conditional Variables.

Variables	Notes
$\mathrm{Ln}p_1^\tau$ = PEQUITY (price of equity)	r_1 = Return on shares = The rate of change in share prices
$\mathrm{Ln}p_2^\tau$ = PDEBT (price of debt)	r_2 = SBI's discount rate for 3 months commercial bills for the period 1951–1952 and 1956–1957 and SBI's advance rate for the rest of the sample period
$\mathrm{Ln}p_3^\tau$ = PDEP (price of deposits)	r_3 = Bank deposit rate for 1–3 years
$\mathrm{Ln}(Y/W)$	Log of GDP at factor cost deflated by W
SLR	Statutory liquidity ratio (policy instrument)
Dummy 69	0: 1951–1968 and 1: 1969–1993
Dummy 90	0: 1951–1989 and 1: 1990–1993

Note: SBI, State Bank of India.

distinguishes the common practice of the use of panel data drawn from individual firms in determining capital structure.

The share of holding financial liabilities is a dependent variable, and this is a proportion of each financial liability in the total liabilities. Table 3 presents the mean shares of financial instruments. It is shown that borrowing is the dominant component of the capital structure in India over the sample period.[4]

The nominal interest rates used for the AIDS prices and conditional variables are found in Table 4. The CPI is used for the price index (Z) and for the rate of inflation (g). For the return on shares (r_1), the rate of change in share prices is used since data for dividend yields are not available over the sample period.[5] Deposit rates are viewed as the opportunity cost of withdrawing deposits as an internal source of finance. The derivation of the expected rates of return is found in the appendix. Following the concavity (i.e. negativity) in the AIDS cost function, the theoretically expected sign on the own-price coefficients is negative, i.e. an increase in the own-prices, or the cost of capital, is expected to decrease the holdings of financial liabilities.

Note that share prices are inversely related to the expected return on shares (see appendix). Then, the predicted negative sign on the own price of equity (PEQUITY) suggests that as the share prices rise, the corporate sector increases equity finance. This is in line with the Tobin's Q hypothesis.[6] Evidently, when the financial market reforms started in the 1980s in many developing countries, firms resorted so much to equity since the associated rise in share prices diluted the transaction costs (Cobham & Subramaniam, 1998; Mayer, 1988; Singh, 1997). However, Tobin's Q theory assumes a strong relationship between the behaviour of the firm and its share price. Clearly, market inefficiency and speculation are the main aspects for developing countries, and that Tobin's Q hypothesis may be an inaccurate measure for India.

The inclusion of aggregated income (i.e. $\ln(Y/W)$) captures any cyclical influences on firms' portfolios. The policy variable, the statutory liquidity ratio (SLR), requires banks to invest a certain proportion of their deposit liabilities in government securities or government-approved securities in public sector financial institutions.[7] Since some part of the funds in government-approved securities are directed towards the corporate sector, SLR is expected to influence corporate finance.

India experienced two major shifts in the financial sector over the sample period. First, in 1969, the major commercial banks were nationalised, and the government stipulated a group of priority sectors including agriculture, small industry and business, and small transport operations. Lending to these sectors was to be given priority by the banks. This is implied by dummy 69. In practise, about 40% of available bank funds (net of cash and liquid assets) were allocated to these sectors, and this is expected to affect the quantity of bank lending to firms.

Second, major financial sector reforms were undertaken at the end of the 1980s and in the early 1990s, implied in dummy 90. During the pre-reform periods, a considerable proportion of credit flows in the banking sector was controlled. The structure of interest rates was complicated with about 50 lending categories and a large number of stipulated interest rates depending on the loan size, usage and types of borrowers. There was a significant cross-subsidy between sectors: pre-emption[8] of resources was at concessional rates of interest; on the other hand, much higher compensating lending rates were imposed on medium and large industries. The financial reforms included the reduction of the statutory reserve ratios, dismantling of the complex administered interest rate structure, and also the laying down of capital adequacy requirements in the banking sector. The financial liberalisation was also aimed at the development and efficiency of the stock market. In the pre-reform period, the market continued to suffer from serious deficiencies due to the prevalence of many unhealthy practices, and also to the regulation of pricing and the high cost of issuing new shares. These factors discouraged corporations from raising funds by issuing new shares, and consequently this resulted in a relatively high debt-equity ratio for Indian companies. Financial reforms included deregulation of issuing shares in that firms were allowed to raise capital from the market without any consent from any authority either for floating the security or for pricing it. The deregulation of the primary issues market led to a decrease in the cost of raising funds in the capital market, and contributed to a significant shift in capital structure for the corporate sector: in 1992–1993 the equity share constituted over 20% of the total sources of funds from 7.8% in 1991–1992.

Prior to estimation, we carried out Chow tests on an equation-by-equation basis to examine carefully for structural breaks at 1969 and 1990. In Table 5, there is evidence of a break in all equations at 1989–1990 to 1990–1991 at a 5% significance level. As to the break point at 1968–1969 to 1969–1970, there is only one equation exhibiting a break. Consistency suggests that we should accept the existence of a break if there is evidence, in even one out of three equations, in the whole system of equations. We, therefore, include both shift dummies in the model specification as a measure of the impact of the institutional shift.[9]

Table 5. Breakpoint Tests.

Behavioural Equations	1968–1969 to 1969–1970 *F*-test	1989–1990 to 1990–1991 *F*-test
Equity	1.14	6.32*
Debt	1.34	4.99*
Deposits	2.76*	5.05*

Notes:

F is the forecast version of the Chow test for parameter stability across the break date.

Significance levels are based on $F = (RSS_T - RSS_{T_1})/T_2/[RSS_{T_1}/(T_1 - k)]$, where RSS_T is the residual sum of squares for the whole sample, RSS_{T_1} is the residual sum of squares for the first T_1 observations, and k is the number of regressors.

Critical values at a 5% significance level (df): for 1969, 2.61 (25, 11) and for 1990, 2.69 (4, 32).

*Significant at the 5% level.

5. UNIT ROOT TESTS

Unit roots are checked by the Dickey–Fuller (DF) and augmented Dickey–Fuller (ADF) tests. Since there are structural shifts found in the demand for financial liabilities in 1969 or 1990, the Perron (1989) method is also conducted. This allows for a shift in the level or slope of the trend at a predetermined point as the alternative to a unit root process. Note, however, the Perron tests are conditional on one break in 1969, since if the break is close to the beginning or end of the sample (as in 1990) the results are similar to the DF tests.

The test result is presented in Table 6. The null of unit root is rejected for the PDEP in levels at a 5% significance level in the DF and ADF tests. For all other variables the null is not rejected in either the DF or the ADF tests. Perron's test statistics are larger (in absolute value) than those of the DF tests, but given larger critical values, the results support those of the DF tests. In the differenced series, the null is rejected for all variables. In the light of this evidence we classify all variables as $I(1)$,[10] except PDEP.

Table 6. Order of Integration of the Variables.

	Level			Differenced	
	DF	ADF (2)	Perron (lag)	DF	ADF (2)
S_1(Equity)	−2.34	−2.02	3.429 (1)	−2.24	−3.45*
S_2(Debt)	−2.76	−2.00	3.829 (1)	−4.99*	−3.50*
S_3(Deposit)	−1.81	−2.15	3.387 (1)	−10.15*	−3.72*
$\ln p_1^\tau$(PEQUITY)	−3.41*	−2.40	3.707 (0)	−5.49*	−4.39*
$\ln p_2^\tau$(PDEBT)	−3.43*	−2.30	3.399 (2)	−5.71*	−3.80*
$\ln p_3^\tau$(PDEP)	−4.03*	−3.24*	4.528 (3)*	−5.86*	−3.92*
$\ln(W^\tau/P^{*\tau})$	−2.43 (t)	−2.28 (t)	2.814 (0)	−6.31*	−3.52*
$\ln(Y/W)$	−2.54 (t)	−3.12 (t)	3.856 (3)	−4.86*	−2.93*
SLR	−0.80	−1.20	1.895 (1)	−3.91*	−2.60

Notes:
Dickey-Fuller (DF) tests: White error is ensured in ADF (2).(t): A deterministic trend is specified in DF and ADF tests as the trend is statistically significant at a 5% level.
Critical value τ_c (constant, no trend): −3.43 (1%), −2.86 (5%), −2.57 (10%), and τ_{ct} (constant, trend): −3.96 (1%), −3.41 (5%), −3.13 (10%) by Davidson and MacKinnon (1993, p. 708).
Perron tests: Perron's model is the t statistic on ρ in

$$\Delta y_t = \mu + \beta t + \theta DU_t + \gamma DT_t^* + \varsigma DTB_t + \rho y_{t-1} + \sum_{i=1}^{k} \delta_i \Delta y_{t-i} + e_t$$

where $T_B = 1969$; $DU_t = 1$ if $t > T_B$; 0 otherwise; $DT_t = t - T_B$ if $t > T_B$; 0 otherwise; $DTB_t = 1$ if $t = T_B$; 0 otherwise. Critical value for $t_{\hat{\rho}}$: 4.21 (5%), 4.85 (1%) (Perron, 1989, p. 1377).
*Significant at the 5% level.

The presence of the $I(0)$ variable in regressions does not vitiate subsequent tests for cointegration, in particular, if theory a priori indicates that such a $I(0)$ variable should be included (Harris, 1995, p. 80).

6. ESTIMATION AND RESULT OF THE LONG-RUN MODEL

With the theoretical restrictions of the AIDS model (5a, 5b and 5c) imposed on coefficients in a system of equations, shocks, which affect one equation, could influence the other equations resulting in correlations among the error terms. The SURE technique of Zellner (1962) exploits these cross-correlations to achieve more efficient estimates, and this technique is utilised.

The estimated coefficients of the long-run model are shown in Table 7. Homogeneity and symmetry on the price coefficients are imposed across equations. The imposition is not rejected by the small sample adjusted-likelihood test[11] at a 5% significance level: $\chi^2(3) = 7.79$ against the critical value at 7.82. Furthermore, zero is imposed on $\ln(W^{\tau}/P^{*\tau})$ in the debt equation, which is also consistent with the data.

The Engle–Granger (EG) cointegration test is indicative of a stable long-run relationship in share equations with the null being rejected at a 5% significance level with the DF test (though the indication of cointegration is weak in the ADF tests). It is argued that the EG test is only applicable when there is a single cointegrating vector, and it may suffer from small-sample bias (Banerjee, Dolad, Galbraith, & Hendry, 1993). We, therefore, checked our cointegration results using the Johansen approach (Johansen & Juselius, 1990). It is found that the Johansen test supported the evidence of co integration.[12] This would confirm the presence of a stable long-run relationship among $I(1)$ endogenous variables in the system of equations.

The goodness of fit is satisfactorily high. There is no suggestion of heteroskedasticity; however, the model suffers from serial correlation. Note that in a system of equations, it is difficult to correct for autocorrelation without violating accounting constraints (Hay & Louri, 1989). Even in the presence of autocorrelation, equilibrium estimates are super-consistent, as cointegration is found (Engle & Granger, 1987).

All the own-price coefficients satisfy the a priori expectations with a negative sign. It is important to note that with the evidence of the negative own-price effects and non-rejection of symmetry and homogeneity constraints, the data appear to be coherent with the axioms of rational choice. The conditional variables are statistically quite significant. All these results

Table 7. Long-Run Specific Model (Homogeneity and Symmetry Imposed).

	$\ln p_1^{\tau}$ (PEQUITY)	$\ln p_2^{\tau}$ (PDEBT)	$\ln p_3^{\tau}$ (PDEP)	Constant	$\ln(W^{\tau}/P^{*\tau})$	$\ln(Y/W)$	SLR	Dummy 69	Dummy 90	R^2 %	LM Hetero	LM Auto (2)	DF	ADF (2)
1.	−0.0804	0.0836	−0.0032	−0.5613	0.0459	0.4829	−0.0102	−0.0630	0.1255	97.00	0.051	14.258	−4.837	−3.980
Equity	(1.65)	(1.74)	(0.16)	(3.63)	(2.40)	(13.87)	(3.51)	(1.95)	(4.59)					
2.		−0.1573	0.0737	1.1107	0	−0.3396	0.0121	0.0476	−0.0928	96.69	1.758	17.309	−4.574	−3.727
Debt		(0.59)	(0.28)	(10.35)		(13.76)	(4.101)	(1.48)	(3.46)					
3.			−0.0705	0.4506	−0.0459	−0.1433	−0.0019	0.0155	−0.0327	67.77	2.729	12.408	−4.830	−2.969
Deposit			(0.27)	(3.66)	(2.40)	(5.43)	(1.13)	(1.15)	(2.64)					
Sum	0	0	0	1	0	0	0	0	0					

Notes:
t-ratio is in parenthesis. No. of observations: 43 (1951–1952 to 1993–1994). Zero is imposed.
LM heteroskedasticity and LM autocorrelation critical values at the 5% significance level are 3.84 and 5.99, respectively.
Asymptotic critical values for cointegration tests: 4.10 (5%), 3.81 (10 %) (Davidson & MacKinnon, 1993, p. 722).

Table 8. Elasticities.

	PEQUITY	PDEBT	PDEP	Wealth	Income
Equity	−0.223	0.233	−0.009	1.127	1.340
Debt	0.112	−0.211	0.099	1.000	−0.456
Deposit	−0.031	0.700	−0.668	0.564	−1.359

Note: All elasticities are calculated using the mean portfolio shares.

coupled with the evidence of cointegration may perhaps warrant us to draw inference from the empirical results. The price, wealth and income elasticities are found in Table 8.

The negative effect of the own price on equity finance means that a fall in the cost of equity capital (i.e. an increase in share prices) increases equity issues. The result supports Tobin's Q hypothesis. However, the magnitude of the effect is small with the elasticity at 0.22. This may reflect some developing country-specific features in equity financing. It is pointed out that share prices in emerging markets tend to fluctuate (Singh, 1997), and the high degree of variability may have a detrimental influence on a stock market. It may discourage risk-averse investors from investing in the stock market, and also discourage risk-averse firms from raising funds through the market (e.g. Singh & Weisse, 1998). Furthermore, due to speculative movements, share prices in many emerging markets tend to deviate considerably from the fundamentals. In this respect, evidence of the weak role of share prices as an instrument of resource allocation is quite plausible for India.

A fall in the cost of debt capital increases debt financing, as predicted; however, the impact is also weak given the price elasticity at 0.21. This appears to reflect the so-called financial repression prevalent in the credit market of developing economies. With restrictive interest rate structures coupled with directed credit allocation, responsiveness to the cost of capital is to a considerable extent reduced. The fact that bank loans are the major external source of funds for companies may further contribute to the weak effect of the cost of debt.

The substitution effects are, nevertheless, evident among the two sources of finance. The price coefficients and elasticities suggest that equity and debt are viewed as alternative sources. Substitute effects of debt *versus* internal finance (or withdrawing deposits) are also apparent. This suggests that in the presence of an increase in the relative price of debt, firms may employ more equity or internal finance by reducing the quantity of debt finance.

With respect to the total real assets (i.e. wealth) and aggregate income, equity is viewed as being a luxury good since both elasticities exceed the unity (1.128 and 1.34, respectively). When the level of physical assets and/or income rises, firms use more equity to meet the shortage of finance. In particular, the stronger income impact on equity financing than that of the own price suggests that Indian non-financial companies behave cautiously, by not directly responding to volatile share prices, but by following the fundamentals in issuing new shares. On the other hand, debt finance appears to be independent with respect to wealth, and an inferior good with respect to income, given the elasticities of unity and −0.455, respectively. This indicates that firms' borrowing is independent of the level of physical investment, and when income falls, firms rely on borrowing. This is not an implausible result in view of the fact that debt finance is dominant in the Indian corporate sector.

The estimation result in the deposit equation provides some aspect of the traditional pecking order of sources of finance. An increase in the deposit rate leads to a fall in withdrawal of deposits, and this is intuitively plausible. However, again the price elasticity is small. It is argued that the net value of deposits (as working capital) is a concern to the managers and the short-term creditors of a firm, as it indicates a firm's ability to meet immediate obligations and to continue operations (Hay & Louri, 1991). Therefore, the primary reason that most corporations hold liquid assets is to facilitate adjustment between debt and equity, presumably as a buffer against unexpected adverse cash flows (Spies, 1974). It follows that the drawing down of internal finance may be more affected by factors other than the opportunity cost, for example, income, as there is found a relatively large income elasticity (at –1.35) on the deposit equation. The negative effect would seem to imply that as income falls, it becomes difficult to obtain funds externally and hence firms draw down their internal finance.

The statistically significant influence of a policy variable, SLR, suggests relatively strong policy impact on the capital structure in India (Table 7). The positive sign on the debt indicates that as the ratio increases, more liquidity reserves in the banking sector are distributed to the corporate sector in the form of debt. To the extent that debt finance is less risky and less costly than equity finance, SLR exerts a preferable effect.

The effect of dummy 69 is found to be positive on debt and negative on equity. The positive impact on debt finance seems counterintuitive, since credit rationing in favour of the priority sectors was implied to reduce bank lending towards the corporate sector. However, the control of credit, in general, dampens the capital markets, and this may have led to a fall in expected share prices resulting in a decline in equity finance. This may explain the increase in the share of holding debt finance.

With a positive sign on the dummy 90 in the equity equation, the effect of financial liberalisation on the stock market is perceptible. This is consistent with the experience that the Indian stock market had with rising share prices in the post-reform period. The impact of the financial reform is negative on debt finance. This is also evidenced in India. In the post-reform period, due to the introduction of market-related government securities' yields, which raised nominal yields, and also the enforcement of the capital to risk weighted asset ratio of 8% (complying with international standards) in the banking sector, banks expanded risk-free investment in the government sector by curtailing loans towards the private sector. This may have forced the corporate sector to move from obtaining their sources of funds from bank borrowing, towards the capital market in the post-reform period.

7. DYNAMIC ERROR CORRECTION MODEL

The problem in modelling dynamic behaviour is the relatively small size of the sample. In order to circumvent this problem and also to gain efficiency, homogeneity, symmetry and zeros are imposed, and they are not rejected by the small sample adjusted likelihood test at a 5% significance level: for homogeneity and symmetry $\chi^2(3) = 6.510$ with the critical value of 7.82, and for zero impositions $\chi^2(8) = 6.103$ with the critical value of 15.51. The parsimonious dynamic model is found in Table 9.

There is no evidence of autocorrelation at the 5% level. However, with the presence of heteroscedasticiy, standard errors are computed from a heteroskedastic-consistent matrix. The dynamic stability is checked by the cumulative sum of the recursive residuals (see Fig. 1). The recursive residuals are within the range of the two critical lines indicating the absence of parameter instability.

A notable feature is that the own error-correction effects (e_{t-1}) are all of correct sign, being negative with a statistically highly significance. The magnitudes of the error-correction terms predict that the speed of adjustment towards the equilibrium level is consistent with the relative liquidity of the assets, from deposit, to debt and to equity (though not much difference between debt and equity). It takes about 6 months for debt and equity to adjust towards the equilibrium levels, whereas almost an instantaneous adjustment takes place in the case of deposits. If the role of internal finance is to act as a buffer against a firms' liquidity crunch, as discussed earlier, this is sensible.

Table 9. Error Correction Dynamic Model (Homogeneity and Symmetry Imposed).

	$\Delta\ln p_1^{\tau}$ (PEQUITY)	$\Delta\ln p_2^{\tau}$ (PDEBT)	$\Delta\ln p_3^{\tau}$ (PDEP)	Δ $\ln(W^{\tau}/P^{*\tau})$	Δ $\ln(Y/W)$	ΔSLR	Dummy 69	Dummy 90	Equity e_{-1}	Debt e_{-1}	Deposit e_{-1}†	R^2 %	LM Hetero	LM Auto (2)
1. ΔEquity	−0.0113	0.0238	−0.0125	−0.0853	0.1797	−0.0114	0	0.0559	0.4462 (6.08)	0	0.5462	68.81	8.22	4.86
	(0.56)	(0.88)	(0.89)	(3.56)	(2.76)	(6.74)		(3.54)						
2. ΔDebt		−0.5784	0.5547	0.0853	−0.1391	0.0114	0	−0.0559	0	−0.4897	0.4897	50.80	5.12	3.27
		(1.53)	(1.46)	(3.56)	(1.97)	(6.74)		(3.54)		(6.09)				
3. ΔDeposit			−0.5422	0	−0.0406	0	0	0	0.4462	0.4897	−0.9359	57.19	10.49	2.74
			(1.42)		(1.86)				(6.08)	(6.09)				
Sum	0	0	0	0	0	0	0	0	0	0	0			

Notes:
t-ratio is in parenthesis.
Standard errors computed from heteroskedastic-consistent matrix (Robust-white).
No. of observations: 43 (1951–1952 to 1993–1994). Zeros are imposed.
LM heteroskedasticity and LM autocorrelation critical values at the 5% significance level are 3.84 and 5.99, respectively.
†The coefficients of e_{-1} in deposit are the residual from those of equity and debt.

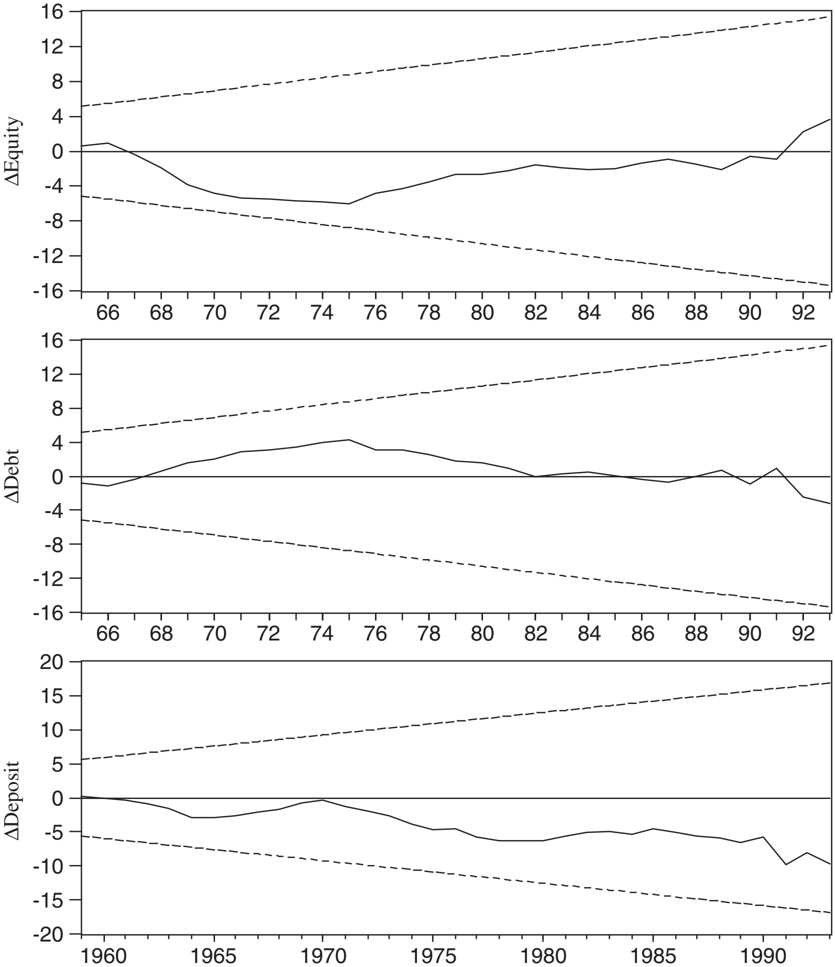

Fig. 1. Recursive Residuals Stability Test.

The sign on the price coefficients accords with that in the long-run model, satisfying negativity. Note that the own-price coefficients of debt and deposit are larger than those in the long-run model, reflecting the short-run dynamics of stronger sensitivity to interest rate changes. With respect to conditional variables, the overall explanatory power remains to be strong, in particular the effect of the policy variable (SLR) and financial liberalisation (dummy 90) are statistically highly significant. In the light of evidence, the dynamic formulation appears to provide a data-coherent estimate, and provides the robustness of the cointegration relationship.

8. CONCLUSION

The paper sheds light on the determinants of corporate finance for India using flow data, based on the AIDS model. Indian firms' decisions about the sources of financing were effectively modelled in the AIDS system of equations with a balance sheet constraint. The dynamic error correction mechanism is also examined in a system of equations to find valid error correction terms and dynamic stability. Both long-run and short-run models are consistent with the axioms of rational choice implied in demand theory.

The key findings are threefold. First, evidence reveals that there are weak effects of the own prices in the estimated model. This seems to reflect financial repression prevalent in the Indian financial sector. The regulatory interest rates and credit control seem to contribute to the reduced role of the cost of capital in financing-decision making. Also under-developed stock markets appear to have considerably undermined the role of share prices in the formation of capital structure. Second, the regulations imposed on banks seem to have exerted a non-trivial influence on credit flows to firms. Third, a sizeable impact of structural breaks was observed through dummy variables. Especially, financial liberalisation is found to be a contributory factor to widening financing opportunities for firms: the sector is able to switch from one source of funds to another relatively easily reflecting an emergence of competitiveness in financial markets in the post-reform period in India.

NOTES

1. This means that short-term and long-term debts are consolidated. This is due to lack of data for the own interest rate of the long-term debt finance over the sample period.
2. For example, the Eighth Five Year Plan (1992–1997) included such projects as education, primary health care, agriculture, infrastructure of energy, transport and communication.
3. The stock data on the 31 March 1951 for the financial instruments are obtained from the combined balance sheets of selected public limited companies.
4. Booth, Aivazian, Demirguc-Kunt, & Maksimovic (2001) also reports a high debt proportion of 67.1% during the period 1980–1990 for India.
5. This is not implausible, given the fact that in India the component of capital appreciation accounts for three-fourths or more of the total returns over the period of 1980–1997 (Gupta & Chowdhury, 2000).

6. Tobin's Q states that as the market value of a firm's equity rises relative to its 'book' value of equity, the cost of issuing equity falls, ceteris paribus, so the firm holds a greater proportion of these sources of finance within its portfolio of liabilities (Prasad, 2000).

7. The ratio was set at 20% until 1963. It reached its highest level of 38% in 1988 and is currently at around 25%.

8. Pre-emption refers to policy-determined prior claims by SLR and Priority Sector Lending Requirements.

9. There are insufficient observations to permit separate slope coefficients.

10. There is a theoretical problem in that asset shares are bounded, and that they cannot be a random walk, since such a series is unbounded (see Adam, 1999; Barr & Cuthbertson, 1991). However, none of them are $I(0)$, hence we continue our co-integration analysis.

11. The small sample adjusted likelihood ratio test is given by the product of likelihood ratio statistic and $(T–K)/T$, where $T =$ no. of observations and $K =$ no. of exogenous variables in each equation. It is distributed as $\chi^2_{(\mathrm{df})}$ (Bohm, Rieder, & Tintner, 1980).

12. The results are available from the authors on request.

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APPENDIX: EXPECTED RATES OF RETURN

For the lending and deposit rates, we employ a perfect-foresight assumption by proxying the expected returns at the beginning of period t by the actual returns realised over the period. Given the regulatory interest rates, this is plausible. With respect to the expected return on shares, 'naïve expectation', a special case of autoregressive expectations, is utilised: Following Friedman and Roley (1979, p. 1477), the return on shares at time t is given by

$$r_t = d_t + g_{t+1} \tag{A.1}$$

where $d =$ the dividend yields (which is known at time t) and $g =$ the capital gain or loss component of the yield defined as

$$g_{t+1} = \frac{p_{t+1} - p_t}{p_t} \tag{A.2}$$

where $p =$ the share prices. g_{t+1} is not known at time t, such that

$$r_t^e = d_t + g_{t+1}^e \tag{A.3}$$

where the e superscript indicates an expectation as of time t. Note that Eq. (A.3) implies that there is an inverse relationship between the expected return on shares and the expected share prices. The investors' expectations of the one-period capital gain (or loss) is formed from its previous period, such that

$$g_{t+1}^e = g_t \tag{A.4}$$

The expected return on shares are given by substituting (A.4) into (A.3) and with the assumption of no dividend yields, it takes the form of

$$r_t^e = g_t \tag{A.5}$$

Then Eq. (A.5) is applied to the return on shares.

SELFISHNESS OR CO-OPERATION: TRADE CREDIT IN MANUFACTURING FIRMS IN ERITREA

Sebhatleab Tewolde and Henk von Eije

ABSTRACT

Traditional finance textbooks recommend selfish optimization of receivables and payables. However, it has been suggested that companies can also benefit from co-operation with customers and suppliers. In this paper, we suggest that the development context of Eritrea may inducecounterbalancing trade credit policies: selfishness to alleviate financia restrictions or co-operation to overcome market imperfections. By combining management interviews, financial accounting information and comparisons with European firms we find that selfish trade credit policies in some Eritrean firms are influenced by ownership characteristics and not by the development status of the country.

1. INTRODUCTION

Many textbook approaches to trade credit suggest that firms seek to maximize company value by their own actions and rarely address their relations

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with suppliers or buyers (Brealey & Myers, 2004; Scherr, 1989; Smart, Megginson, & Gitman, 2004). The implicit message is to increase the cheap financing of the company by reducing receivables and increasing payables. In the traditional approach, the benefit to one company is a loss for the other. Modern value creating theories on the other hand suggest that firms are working in a value chain (Porter, 1985), and that a firm's success in creating value to its owners also depends on how closely it co-operates with its suppliers and customers. Nowadays, it may thus be relevant to study trade credit from a co-operative perspective too. In Section 2, we present the main trade credit theories that address co-operation. Generally, these theories do not specifically apply to developing countries. Consequently, it might be interesting to study trade credit in a development context. In this paper, we present our findings for 10 manufacturing firms in Eritrea. In Section 3, the methodology, cases, and data are explained. Section 4 gives the results of interviews with Eritrean managers. Section 5 analyses information from the annual accounts and Section 6 compares Eritrean firms with their European counterparts. Section 7 contains caveats and conclusions.

2. THEORIES OF TRADE CREDIT

If capital markets were perfect, individual investors could replicate firm liquidity and the firm would not be able to add value by for example extending trade credit (Van Horne, 2002). In perfect markets trade credit benefits will not arise because the selling firm as well as the buying firm have easy access to financing. The starting point for extending trade credit may therefore be found in imperfect capital markets. The documented imperfections are asymmetric information, corporate tax provisions, price discrimination, cyclical markets, transaction costs, and network effects.

Firstly, asymmetric information may impact the financing of firms (Stiglitz & Weiss, 1981). It is quite often the case that vendors have better information on their customers than banks (Banerjee, Dasgupta, & Kim, 2004; Mian & Smith, 1992; Petersen & Rajan, 1997) and vendors may be able to offer cheaper credit than banks can afford. Vendors may be better in assessing and monitoring customers. Suppliers may, moreover, threaten to stop delivering further supplies to their customers when the goods delivered remain unpaid. In case of non-payment, suppliers can quite often seize delivered goods and liquidate them by offering them to another customer, an option that is not readily available to a bank.

Secondly, there may be tax benefits to the vendor if the tax code offers the possibility of an instalment loan (Mian & Smith, 1992). In this case, tax creates a market imperfection, as the vendor will be able to postpone taxes on profits generated from the sale. The increase in present value may induce the vendor to offer trade credit in the form of cheap instalment loans. Financial institutions cannot reap the present value of such tax benefits because they do not generate profits in the goods markets. Therefore, again, vendors may have an advantage over banks.

Thirdly, even if tax and financial market imperfections are absent, the vendor may still provide trade credit if the final product market is not competitive. When vendors are unable to offer finance at lower interest rates than the banks, they may in a non-competitive market use trade credit for price discrimination (Brennan, Maksimovic, & Zechner, 1988). A company may increase its profits by offering trade credit at low or negative interest rates if this attracts buyers that would otherwise not have been able to buy the goods. Such a policy will only create value to the vendor if the interest rate losses to the vendor are more than compensated by the profits from the additional transactions. A related situation may arise when a vendor wants to invest in long-term relationships with its customer and therefore offers trade credit on favourable terms in the short run (Petersen & Rajan, 1997).

Fourthly, Emery (1987) shows that trade credit can be used as a substitute for costly capacity adaptations if the final product market has a cyclical character. Trade credit can induce customers to buy goods in a slack period and, as a result, the costs of inventories will be transferred from the vendor to the buyer.[1]

Fifthly, trade credit may reduce transaction costs (Ferris, 1981). If goods are sent frequently, it may be costly to prepare and collect each bill. A monthly or a quarterly collection period may then be more adequate. Moreover, regular payments may also benefit both parties if goods are sent irregularly. The forewarning of the cash in- and outflows makes it easier for vendors and their customers to plan their cash holdings and to reduce their precautionary cash needs.

Finally, McMillan and Woodruff (1999) suggest that trade credit may be a sign of trust between the supplier and the customer especially in a country where laws of contract are inadequate. This is confirmed by their research in Vietnam, where they find that trade credit is higher if it is more difficult for a customer to find an alternative supplier, when the supplier has information on the customer's reliability and when supplier and customer belong to a network of similar firms.

The theories presented all indicate that vendors in imperfect markets may co-operate with buyers in extending trade credit. This implies that a vendor that co-operates with its customers will have a relatively large ratio of receivables to assets. It also means that a company that co-operates on trade credit with its suppliers will show relatively large amounts of payables in the annual accounts. A company that co-operates with both suppliers and customers through trade credit will have large levels of receivables as well as payables. In contrast, a company that behaves more selfish by minimizing its own costs of financing minimizes its receivables and maximizes its payables. Companies that behave selfishly for this traditional reason will thus show a low ratio of receivables to payables. Empirical research may answer the question whether these theoretical relations hold in practice.

Companies in developing countries face more and larger market imperfections than companies in developed countries (Gibson & Tsakalotos, 1994; Levine, 1997). The imperfections will push companies into two opposing directions. On the one hand, and in line with the co-operation theories discussed, market imperfections may induce vendors to extend and customers to accept trade credit more readily. On the other hand, companies in developing countries may have greater difficulties in finding appropriate financing. This may force them into selfish behaviour by restricting trade credit to their customers while at the same time trying to use trade credit from suppliers as much as possible. Only empirical investigations can then answer the question as to whether co-operation or selfishness dominates.

In this paper, we test the implications of the theory presented above. First, we test whether receivables and payables ratios of co-operative firms differ from the ratios of non-co-operative ones and, second, whether co-operation or selfishness dominates in the developing country context of Eritrea.

3. CASES AND METHODOLOGY

In order to test our hypotheses, we studied manufacturing firms in Eritrea for which we tried to evaluate the cooperativeness. We selected manufacturing firms, because these are the largest firms in the country. We chose the small number of 10 firms, because we tried not only to interview the managers of the "central" firms on their attitude to co-operation, but also the managers of their main suppliers and customers. Co-operation with suppliers and customers cannot, in our opinion, be measured solely through interviews with managers of "central" firms, as it should at least be corroborated with interviews at the suppliers and customers. An important selection criterion was therefore that the general manager of the "central" firm was prepared to be interviewed and to indicate the main supplier and the main customer. The definition of main supplier and customer was based on the frequency of transactions.

We, moreover, selected firms with different ownership status, namely government firms, firms in transition to the private sector, and privatized firms. We studied two government firms, five firms in transition and three recently privatized firms. The reason for the relatively large number of transition firms may be explained from the findings of Hailemariam & von Eije (2004), who found that almost all previously state-owned enterprises in Eritrea were slated for privatization in 1996 (except for two strategic firms). The process of privatization was, however, very slow and therefore most of the firms slated for privatization were not privatized even in 2000 (when most of the interviews for this research were held). Though co-operation and selfishness may be a characteristic of individual firms, we could not approach the main suppliers and customers that were non-domestic. We therefore aggregated individual firms in three classes based on ownership type. Table 1 shows the firms as well as their suppliers and customers.

We used questionnaires and in-depth structured interviews with the general, financial, and commercial managers of the 10 "central" firms in order to evaluate the extent of co-operation. The questions and the structured interviews were prepared and discussed with academics in advance. Moreover, a pilot test was conducted in order to refine the questionnaires and interviews before approaching the respondents. The questionnaires mainly involved Likert scales (1 meaning "do not agree at all", "very small", etc. to 5 meaning "do strongly agree", "very large", etc.). The questions, however, did not only address trade credit but also other forms of possible co-operation on working capital issues because we believe that many aspects of co-operation may have consequences for trade credit. If, for example, a "central" firm co-operates on inbound logistics with its supplier, the latter may be satisfied with the "central" firm, trust it, and be prepared to offer trade credit. Further detailed information on the procedure and the questions is given in Tewolde (2002).

We planned to approach 50 respondents (30 comprising three types of managers of each of the 10 "central" firms, namely the general, the financial, and the commercial managers, plus 10 general managers of suppliers and 10 general managers of customers). Eventually, we interviewed 43 managers (28 managers of the 10 "central" firms, seven managers of main suppliers, and eight managers of main customers). We only interviewed eight customers, because the Asmara Sweater Factory had a non-domestic customer and because the Ministry of Defence was the main customer of both Barka

Table 1. The "Central" Firms and their Suppliers and Customers.

"Central" Firm and Ownership Type	Main Supplier and Ownership Type[a]	Main Customer and Ownership Type[a]
I. Government firms		
1. Keih Bahri Food Products	Eritrean Grain Board (G)	Asmara Pastry (P)
2. Barka Canneries	Gejeret Carton Factory (P)	Ministry of Defence (G)
II. Transition firms		
3. Asmara Textile Factory	Alighider Agricultural Project (P)	Ministry of Defence (G)
4. Lalmba Sack Factory	–	Testec Impex (P)
5. Sembel House Hold Factory	–	Tesfai House Hold Utensils (P)
6. Dahlak Shoe Factory	Keih Bahri Tannery (T)	Mulugheta House Hold (P)
7. Keih Bahri Tannery	Asmelash Hides and Skins (P)	Selamawit Shoe Factory (P)
III. Privatized firms		
8. Asmara Sweater Factory	Beatay Leather Factory (P)	–
9. Asmara Milk Factory	Dept. of Animal Science (G)	Berhane Frafre (P)
10. Eritrean Steel Sheet Factory	–	Segen Construction (P)

[a]The letters in parenthesis indicate ownership status as follows: G (government), T (transition), P (private) and (–) implies a non-domestic firm not interviewed.

Canneries as well as Asmara Textile Factory. The period of data collection extended from November 1999 to September 2000.

The first author personally delivered and collected the questionnaires. Before distributing and collecting the questionnaires, an appointment was made by telephone. On the appointment date, first, an official letter identifying the researcher was handed over. Second, the objective of the study and the meaning of the various questions were explained to the managers. Lastly, the questionnaires were submitted and left with the managers with an appointment for the collection of the answered questionnaires. This first contact took on average about 30 min.Before collecting the questionnaires at least one reminder call was made a day before the date of the appointment and a final reminder one hour before the time of the appointment. When collecting the questionnaires, about 15 min was taken to answer any questions that the manager might have had and an appointment was made for conducting an interview. After the collection of the questionnaires the data were transferred to a data summary sheet by the researcher and notes of inconsistencies or unfilled answers were made. Before the final interview sessions, managers were asked to clarify any unclear answer to the questionnaire. This clarification generally took 15–30 min.

All the interviews were tape-recorded, except for two managers who were not willing to have their interview recorded, in which case notes were taken during the interviews. Notes were taken from the tape-recorded interviews on the same day that the interviews were made in order not to forget observations made during the interviews. Interviews took generally 60–90 min.

4. MANAGEMENT RESPONSES

In this section, we present a summary of the results of the questionnaires and interviews. We distinguish between two types of relations, namely those between the "central" firms and their suppliers and between the "central" firms and their customers. Because we evaluate these relations from the perspective of the "central" firm and from the perspective of the counterparty, we present in total four subsections. We already indicated that co-operation outside the realm of trade credit may be relevant for the question whether a firm receives or offers trade credit. For this reason the following subsections are not limited to co-operation on trade credit solely.

4.1. Firm–Customer Linkages: Responses of Firms

Neither the government firms nor the transition firms reported strong co-operation on primary activities with their customers. The privatized firms on the other hand said they cooperated on production activities and on outbound activities. All three types of firms also reported co-operation on sales and inventory management. All firms received feedback from their customers on the quality of products and services and they allowed them to return any product with inferior quality.

Generally, the firms did not ask customers whether they were satisfied with their products and with inter-firm co-operation. All three types of firms indicated that the benefits of co-operation could be found in increasing sales, while the transition firms also indicated that they minimized the costs of ordering, transportation, and carrying inventories. When asked about reasons for non-co-operation, all types of firms said that customers did not co-operate. Considering the fact that the privatized firms reported themselves to be relatively the most co-operative, it is surprising that the privatized firms had no policy of co-operation and did not see the benefits of co-operation with all of their customers.

4.2. Firm–Customer Linkages: Responses of Customers

The appendix shows that the main customers of all three types of firms believed that the "central" company did not co-operate. The only exceptions were the main customers of the privatized firms with respect to order processing. The lack of co-operation, however, does not mean dissatisfaction. The main customers of the government and privatized firms rated their partners positively on bilateral communications, answering enquiries, and cash collection. The customers of privatized firms also rated their partners favourably on sales processing. The rating of the main customers of the transition firms was less positive, with only positive responses for the cash collection. Despite some positive points, all types of "central" firms were rated low on customer service.

4.3. Firm–Supplier Linkages: Responses of Firms

We found that the government firms claimed to co-operate with suppliers on the inbound activities and in particular on shipment and storing. From the interviews, we learned that government and transition firms hardly co-operated at all with their private suppliers on primary activities because they were not allowed to establish close inter-firm linkages except with "related" government firms. Government regulations, moreover, obliged the firms to purchase their materials from other government firms or from private firms on the basis of competitive bidding. All types of firms concurred with their suppliers on the quality and quantity of goods that the suppliers had to produce for them. Only government firms co-operated with suppliers on the terms of transportation and on the time of delivery.

Co-operation helped government and transition firms to decrease the time and the costs of ordering purchases. In transition firms, co-operation also reduced the carrying costs of inventories and in government firms it increased trust in inter-firm transactional relations. The commercial managers of the privatized firms did not co-operate with their suppliers because they had no policy of inter-firm co-operation and secondly because their suppliers did not co-operate.

4.4. Firm–Supplier Linkages: Responses of Suppliers

As can be seen from the appendix, the suppliers of all firm types responded generally that there is not much firm–supplier co-operation on primary activities. The suppliers co-operated with government firms on delivery operations and with government and transition firms on order processing. The suppliers concurred also with government and privatized firms on delivering goods when needed. Suppliers provided privatized firms with credit without discounts. Suppliers of the government firms felt that co-operation helped to decrease the costs of selling as well as reducing the time needed to sell their products. The latter was also relevant for suppliers of privatized firms. Moreover, the suppliers of privatized firms believed that co-operation decreased the carrying costs of inventory and also created trust. The main reason given by the main suppliers of all the three types of firms for the low level of co-operation is that their customers lacked a willingness to co-operate.

The suppliers of the government firms rated their customer as efficient on most of the aspects distinguished. Moreover, the suppliers of privatized firms rated their partners as efficient on bilateral communication, answers to enquiries, courtesy, the use of supplier services, and payment habits. The suppliers of the transition firms did not rate their partners as high on most aspects.

4.5. Conclusions Based on Management Responses

The interviews and questionnaires indicated, firstly, that the relations between government firms and their customers were determined primarily by government regulations. These dictated how government firms had to coordinate their primary activities, sales, inventory, and other activities related to customers. The management of government firms was thus not empowered to co-operate. Secondly, though the transition firms had somewhat more possibilities to manage their inter-firm linkages, their limited market and their managerial culture and uncertain future constrained them from designing and implementing firm–customer co-operation. The customers of transition firms were, moreover, not very positive about the efficiency of the "central" companies. Thirdly, the firm–customer relation of the privatized firms was not efficient because of management culture, the lack of managerial experience in the private sector, and the absence of other firms in the country with exemplary firm–customer relationships. In general, none of the firm types had policies to keep in touch or to improve the relations with their customers.

The comparison of firm and supplier responses shows that the government firms believed that there was some co-operation. The responses of the suppliers corroborated this. The transition firms, on the other hand, did not believe that there was much co-operation and their main suppliers confirmed the lack of co-operation. The privatized firms did not evaluate their co-operation with their suppliers as very relevant, but their suppliers were more positive about co-operation with the privatized firms.

5. TRADE CREDIT IN FINANCIAL ACCOUNTS

In the previous section, we found that there was hardly any co-operation amongst Eritrean firms and their customers. It is thus likely that trade credit forwarded by the Eritrean "central" firms will be scarce and that their receivables will be relatively small. Receivables would, however, be relatively low too, if the lack of co-operation made the "central" firms selfish optimizers.

With respect to the co-operation with suppliers, we found in the previous section that some co-operation existed between suppliers and the government firms as well as between suppliers and privatized firms. If the suppliers provide trade credit from the perspective of co-operation, the payables of the "central" firms might increase. Co-operation was, however, absent in transition firms and this lack of co-operation would reduce payables. On the other hand, a lack of co-operation might also go together with selfishly maximizing payables.

If we assume that credit policies and payment periods within an industry are the same, then receivables should be larger than payables because the receivables include value added. This implies that the ratio of receivables to payables normally would be larger than one.. Vertically linked firms, however, do not need to have identical trade credit policies. If co-operation with customers increases, it is – ceteris paribus – likely that the ratio of receivables to payables will rise. Because we found hardly any co-operation between "central" firms and customers, we expect a low ratio of receivables to payables in Eritrea and this ratio will further decrease if there is co-operation with the suppliers (because that increases payables). If we follow this reasoning, the lack of co-operation between suppliers and transition firms makes us to expect the ratio of receivables to payables to be highest in transition firms. If, on the other hand, the lack of co-operation induces transition firms into financially selfish behaviour, then payables would be relatively high. Selfishness then reduces the ratio of receivables to payables.

Table 2 indicates the totals of receivables and payables as percentages of assets in the 10 "central" Eritrean firms. We tested the differences between the year 2000 and the years 1996 and 1998 with a matched pairs t-test for all 10 companies. It showed that only the increase in payables percentages from 1996 (24%) to 2000 (31%) was significant (with a p-value of 0.088).[2]

Table 2. Receivables and Payables of the "Central" Firms as Percentages of Assets.

	Receivables as a Percentage of Assets			Payables as a Percentage of Assets		
Year	1996	1998	2000	1996	1998	2000
1. KBFP (G)	46	45	64	63	73	71
2. BC (G)	20	30	5	5	4	3
3. ATF (T)	7	14	7	51	57	37
4. LSF (T)	1	14	6	18	17	25
5. SHHF (T)	6	0	1	23	22	48
6. DSF (T)	8	6	6	31	29	41
7. KBT (T)	11	1	6	18	29	31
8. ASF (P)	11	2	18	9	1	3
9. AMF (P)	3	9	10	19	13	44
10. ESSF (P)	1	15	82	2	27	11
Average	11	14	21	24	27	31
Standard deviation	13	14	28	20	22	22

Notes: The full names of the firms are presented in Table 1. We have added here the type of ownership: G = government owned firm, T = transition firm, and P = privatized firm.

Then we also tested whether there were significant differences over time within the three firm types, but the matched pairs t-test did not indicate any significant shifts over time for different ownership types. This suggested that the change from government firms to either transition or privatized firms did neither influence the ratios of receivables nor the ratios of payables.

However, further inspection of the data showed the percentage of receivables to be relatively low among transition firms. We tested, using the independent samples t-test, the differences between the receivables ratios in transition firms and those of the other two types of firms. In the year 2000 a significant difference was found.[3,4] We were not surprised to find such a result, as the interviews had already revealed that the customers of the transition firms were not very positive at the time of interviews (November 1999–September 2000).

With respect to the payables, the government firms did not change significantly between 1996 and 2000. For the privatized firms, the payables of the Asmara milk factory were larger in 2000 than in the preceding years. Finally, four of the five transition firms had the largest percentage of payables in 2000. It is unlikely that this is caused by improved co-operation, because the interviews suggested that co-operation of transition firms with their suppliers was low. We therefore think that selfish optimization of payables was more important in these firms. We tested whether the average payables to assets ratio was larger in transition firms than in the other two types of firms. The independent samples' *t*-tests did not give significant differences in the payables ratios in any of the years. However, one-sample *t*-tests indicated that the average payables to assets ratio among the transition firms were significantly larger in the year 2000 (but not in 1996 and 1998).

Though we did not find significant differences over time amongst the various types of firms, the comparisons of transition firms with the other Eritrean firms suggest that at least in the year 2000 the transition firms on an average were less co-operative and more selfish than the other Eritrean firms. In order to test whether these results were specific for the transition firms, we compared the receivables ratios and the payables ratios for Eritrean firms with the average ratios of small European firms from the same industry.[5]

6. A COMPARISON WITH EUROPE

Table 3 compares the Eritrean "central" firms with the averages of comparable European firms in the Amadeus database for the year 2000. We searched

Table 3. The Eritrean Ratio of Receivables to Payables and Average Ratios for Comparable European Firms in the Year 2000.

Company	European Industry Code	Number of Comparable Small European Firms	European Receivables as % of Assets	European Payables as % of Assets	European Ratio of Receivables to Payables	Eritrean Ratio of Receivables to Payables
1 KBFP (G)	1,561	121	35	18	1.91	0.90
2 BC (G)	1,533	136	31	27	1.14	1.34
3 ATF (T)	1,711	63	29	19	1.52	0.18
4 LSF (T)	1,725	27	36	28	1.28	0.25
5 SHHF (T)	2,972	18	32	31	1.04	0.02
6 DSF (T)	1,930	180	23	31	0.74	0.15
7 KBT (T)	1,910	76	44	26	1.71	0.21
8 ASF (P)	1,740	66	25	26	0.98	5.73
9 AMF (P)	1,551	196	32	30	1.10	0.22
10 ESSF (P)	2,840	126	38	31	1.21	7.34
Average	–	101	33	27	1.26	1.63
Standard deviation	–	61	6	5	0.35	2.64

Note: The full names of the firms are presented in Table 1. We have added here the type of ownership: G = government owned firm, T = transition firm, and P = privatized firm.

for comparable industries (indicated by their industry code) and within these industries we selected the small firms. For these small European firms we calculated the averages of receivables and payables and we related these to average assets. We also calculated the ratios of receivables to payables in the European industries as well in the specific Eritrean firms.

In comparing the receivables to assets ratios in Eritrea (Table 2) with those of comparable European companies (Table 3), we find in eight out of the 10 cases the Eritrean ratios to be smaller. On average, the receivables to assets percentage in Eritrea was 21, with an average percentage in Europe of 33. Because the difference was not significant in a matched pairs *t*-test we can, however, not conclude that the Eritrean firms are less co-operative or more selfish.[6] The payables to assets percentages in the Eritrean firms are on an average 33 and thus somewhat larger than those of the European counterparts with an average of 27, but this difference was not significant either. Finally, the receivables to payables ratio in Eritrea of 1.63 proved to be higher than that of the European counterparts at 1.26, but this difference was again insignificant. The payables and receivables in the 10 companies studied therefore do not differ significantly from their European counterparts.

The question can now be raised whether the conclusion will hold for the three types of companies. The matched pairs *t*-test did not show significant differences between the government firms and their European counterparts and neither did the privatization firms. The transition firms, however, showed significant differences with the averages of comparable firms in Europe. This is presented in Table 4.

Table 4 indicates that the transition firms in Eritrea were significantly different from small companies in the same industries in Europe.

Table 4. Paired Samples *t*-Test for Comparing Eritrean Transition Firms with their European Counterparts in the Year 2000.

	Eritrean Average	Comparable European Average	Difference	*t*-Value	Two-Tailed Significance
Receivables as a % of assets	5	33	−28	−7.52	.002
Payables as a % of assets	36	27	9	2.41	.074
Receivables as a % of payables	16	126	−110	−7.01	.002

The receivables ratio was on average smaller, while the payables ratio was larger. Therefore, the ratio of receivables to payables was much smaller in Eritrean transition firms too. Our conclusion is that the selfish maximization of receivables and payables in Eritrean transition firms is specific for the transition firms and that it cannot be attributed to the industries in which these companies work. In this sense, the comparison with European firms confirms the results of the previous sections. Transition firms in Eritrea are different from other companies in that country.

7. SUMMARY AND CONCLUSIONS

In perfect financial markets, receivables and payables may not add value to a company. In imperfect markets when financing is scarce, companies may be advised to minimize receivables and maximize payables. With an improved financial position, on the other hand, companies may try to co-operate with their customers in extending trade credit. This would increase receivables with the suppliers and payables with the customers and both firms can gain from mutual co-operation. The available literature suggests that co-operation may arise with various types of market imperfections. In developing countries, market imperfections are generally large. This may induce companies to become co-operative, but on the other hand financial restrictions arising from market imperfections may also induce companies to become more selfish by minimizing receivables and maximizing payables. For this reason, we studied the behaviour of 10 industrial companies in Eritrea with respect to payables and receivables.

We first asked managers of these 10 "central" firms about their co-operation with customers and suppliers and we proceeded by questioning their main customers and suppliers too. When we classified the companies by ownership type, we found indications that customers and suppliers were less satisfied with companies in transition to privatization than with government owned and privatized companies. We then tested whether there had been significant changes over time.

We found an increase in payables in all Eritrean companies between 1996 and 2000. For the transition firms, we found indications that the receivables ratios were lower in 2000, while the payables ratios were higher. The combined influence caused the ratio of receivables to payables in Eritrean transition firms (with 0.16) to deviate from the similar ratio in the other companies (with 3.11). We finally compared the Eritrean firms for the year 2000 with European companies of comparable size in the same industry.

We did not find significant differences between Eritrean firms and averages of comparable European firms. This suggests that co-operation may not depend on the state of development of the economy in which the firms operate. Our theoretical approach already indicated that two opposing effects may interact. First, the larger market imperfections in a developing country may induce co-operation, but a scarcity of financial resources may foster the need for selfish optimization of trade credit.

However, a comparison of Eritrean transition firms' ratios with averages of comparable European firms showed that the Eritrean transition firms had lower receivables, more payables, and a lower ratio of receivables to payables, while other Eritrean firms had not. The Eritrean transition firms thus held a special position. The low receivables ratio suggests either low co-operation with the customers or a selfish minimization of receivables originating from a lack of financing. The high payables ratio suggests co-operation or selfish maximization of payables arising from scarce financing. Because both the customers and the suppliers of the transition companies were not positive about the co-operation of transition firms, we may conclude that these firms were largely driven by a scarcity of finance. This conclusion is corroborated by unrelated research of Hailemariam (2001), who also found important financial restrictions within the transition firms.

This research had some limitations. First, the methodology used here was based on a small number of firms. As a result, the statistical tests may not have been able to locate underlying relationships, and in this case we did not find significant differences between Eritrean companies and their European counterparts. The small number of firms arose from a need to approach the managers of the "central" firms as well as the managers of customers and suppliers. This procedure made it possible to conclude that the different position of transition firms is unlikely to arise from co-operation and that selfishness originating from limited financing opportunities may have been more important. Using both interviews as well as statistics had advantages here.

A second limitation of this research is the absence of potential policy conclusions. The research does not show whether the trade policies used by the Eritrean firms were optimal or not. Many of the Eritrean transition firms had severe financial restrictions, and it may have been a sheer necessity for them to follow selfish trade credit policies, but whether the combination of restricted financing and selfish trade credit policies is optimal cannot be answered.

We are not aware of other studies that compare trade credit in developing countries with that of developed countries. In this paper, we found no significant differences between European and Eritrean firms in general. This may have been caused by the large variation among the individual Eritrean firms, but it may also arise from the fact that we did not distinguish within Europe between the more developed and the relatively less developed countries. We therefore think that – despite of our insignificant results – further empirical work on trade credit differences between developed and developing countries is needed. Our research, nevertheless, suggests that a developing environment is not the main determinant of trade credit. In fact, ownership may matter more as we found that firms in transition to privatization in Eritrea were on average more selfish in their trade credit policies than the other Eritrean companies.

NOTES

1. The present value of the costs of additional inventories to the buyer should then be smaller than the costs of buying more expensive goods in a future booming economy. For the vendor the costs of extending trade credit should be smaller than the costs of smoothing production by holding inventories.
2. Because of the small number of observations we accepted a significance level of 10%.
3. The p-value of the two-tailed significance was 0.086 with equal variances assumed. Statistical equality of variances was found with Levene's F-test with a p-value of 0.000. We also tested whether there were systematic differences between the receivable ratios in transition firms with a one-sample t-test and by using the averages of the non-transition firms as the test value. With this test the receivable ratios in 1996, 1998, and 2000 were significantly smaller for the transition firms with p-values of 0.004, 0.013, and 0.000, respectively.
4. Whether the difference in receivable ratios is caused by low co-operation with the customers or by selfishness cannot be discerned.
5. This also allowed us to test whether there were systematic differences in working capital between the developing country of Eritrea and the more developed European countries.
6. Insignificance may have arisen because we are comparing averages of European firms with individual results of Eritrean firms and a large standard deviation amongst the Eritrean individual firms will have influenced the results.

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APPENDIX

Intensity of Co-operation of the "Central" Government, Transition, and Privatized Firms According to the Main Customers and Main Suppliers on Various Issues.

	Government		Transition		Privatized	
	C	S	C	S	C	S
A. Co-operation on						
Production activities						
Machining	–	–	–	–	–	–
Packaging	–	–	–	–	–	–
Assembling	–	–	–	–	–	–
Equipment maintenance	–	–	–	–	–	–
Product testing	–	–	–	–	–	–
Facility operations	–	–	–	–	–	–
In- and outbound activities						
Inventory control	–	–	–	–	–	–
Delivery vehicle operation	–	+	–			
Order processing	–	+		+	+	
Marketing and sales						
Advertising	–		–	–	–	
Sales force	–		–	–	–	–
Sales channel selection	–		–	–	–	–
After sales services						
Installation	–	–	–	–	–	–
Repair	–	–	–	–	–	–
Customer training	–	–	–	–	–	–
Parts supply	–	–	–	–	–	–
Product adjustment	–		–	–	–	–
Sales operation and inventory						
Exchanging skilled staff	–	–	–	–	–	–
Credit transaction without discounts	–		–			+
Credit transaction with discounts	–	–	–	–	–	–

APPENDIX (*Continued*)

	Government		Transition		Privatized	
	C	S	C	S	C	S
Providing goods when just needed	–	+	–			+
B. Benefits of co-operation						
Decrease costs of purchasing/selling		+	–		–	
Decrease the time needed to purchase/sell	–	+				+
Decrease the carrying cost of inventory	–		–		–	+
Create trust	–		–			+
C. Reasons for non-cooperation						
You do not have the policy	–	–	–	–	–	–
The supplier/customer does not co-operate	+	+	+	+	+	+
You do not see benefits	–	–	–	–	–	–
D. Supplier rating of firm efficiency on						
Marketing approach	–	+	–			
Sales/purchase order processing	–	+			+	
Bilateral communication	+	+			+	+
Explanation to inquiries	+	+		–	+	+
Using customer/supplier services	–	*	–	*	–	+
Cash collection/payment habits	+	+	+		+	+

Note: The answers on Likert scale questions are summarized for the customers (C) and the suppliers (S) of the ''central'' firm. The average answers for the two ''central'' government firms are presented as well as the average answers for the five ''central'' firms in transition to privatization and for the three ''central'' privatized firms. An average score of two or less is indicated with a minus sign and an average of four and higher with a plus sign. The remaining average Likert scale scores are left blank. ''*'' indicates that no answers were available.

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THE SMALL-FIRM AND PRICE-EARNING EFFECTS: EVIDENCE FROM AFRICAN STOCK MARKETS

Chipo Mlambo and Nicholas Biekpe

ABSTRACT

The paper examines the relationship between stock returns and beta, size and the price-earnings (P/E) ratio for eight African stock markets for the period between 1997 and 2002. The positive relation between average returns and beta hypothesised in the finance literature is mostly either reversed or nonexistent. The size effect is observed only for Mauritius and Zimbabwe, whereas the P/E effect is evident for Egypt, Kenya, and Morocco. The effects are generally not specific to January for most markets. In the month-by-month regressions, reversed size and P/E effects dominate on most markets, although they are, generally, not significant.

1. INTRODUCTION

The testing of market efficiency is considered a joint hypothesis problem in that both the asset-pricing model, usually the capital asset pricing model (CAPM), and the efficient market hypothesis (EMH) are assumed to be valid. The approach normally involves testing whether a trading strategy

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beats the market on a risk-adjusted basis, whereby adjusting for risk requires an asset-pricing model. In such a case, the failure of the EMH to hold may be a result of the use of a poor asset-pricing model rather than a reflection on the inefficiency of the market.

According to the CAPM of Sharpe (1964), Lintner (1965), and Black (1972), under certain assumptions, the rate of return on any security is linearly related to that security's systematic risk or beta measured relative to the market portfolio of all marketable securities. Such a relationship between average returns and beta has been documented as positive (e.g. Pettengill, Sundaram, & Mathur, 1995). Some studies in the 1970s (e.g. Black, Jensen, & Scholes, 1972; Blume & Friend, 1973; Fama & MacBeth, 1973) found the estimated intercept to be higher than the risk-free rate and the estimated coefficient on beta to be much lower than predicted by the CAPM, and only marginally important in explaining cross-sectional differences in average security returns (Hawawini & Keim, 1995).

Concerns on the suitability of the CAPM model have resulted in the formulation of alternative models adding to the so-called market anomalies. Among these anomalies are the price-earnings and firm-size effects of Basu (1977) and Banz (1981), respectively. Basu (1977) and Banz (1981) found that the P/E ratio and the market capitalisation of common equity (ME), respectively, provide considerably more explanatory power than beta. This paper extends the investigation of these two anomalies to a number of African stock markets. Although the periods investigated are relatively short, in comparison to similar studies on other markets, the study will serve as a reference point for future research on African stock markets. To the best of our knowledge, there is currently no published research that has adopted this approach for the African markets. Hawawini and Keim (1995) suggest that the analysis of international evidence on the size effect, where the market organisations and structures are very different, may be quite useful in understanding the cause of the size effect. According to Reinganum (1990), the differences are related to differences in liquidity between two markets.

The paper proceeds as follows. Section 2 presents the data and methodology, Section 3 presents the results, and Section 4 concludes the paper.

2. DATA AND METHODOLOGY

Data (stock prices, volume traded, ME, and P/E ratios) for Egypt, Morocco, Kenya, Mauritius and Zimbabwe were obtained from DataStream.

For Botswana, and Namibia data were obtained from the respective stock exchanges while for Tunisia the sources of data were stockbrokers (see Table 1). Due to the problem of thin trading on African stock markets, beta was estimated using the trade-to-trade approach (Bowie, 1994; Bradfield & Barr, 1989; Dimson, 1979). Bowie (1994) found the trade-to-trade beta estimators to be superior to other methods in correcting for thin trading in terms of both unbiasedness and efficiency. In addition, this approach is also the best in estimating betas of individual stocks. This means that in our analyses there is no need to allocate portfolio betas to individual stocks, as is the case in prior studies, thus a unique beta for each stock.

The Fama and MacBeth (1973) regressions in this study are only carried out on those markets where the sampled stocks are at least 30. These markets are Egypt with 55 stocks in the sample, Kenya with 40 stocks, Morocco with 36 stocks, Tunisia with 35 stocks, and Zimbabwe with 39 stocks. These sample sizes are far too small in comparison to those used in studies on other markets. For example, the sample size used by Fama and French (1992) comprised, on average, 2,267 stocks per month. While earlier studies used deciles in creating the portfolios, this study could not use deciles due to the small number of sampled stocks for each market. Stocks are, however,

Table 1. Data.

Country/ Stock Market	Number of Stocks	Period Covered		Data Source
		Small-Firm Effect	P/E Effect	
Botswana	12	March 1998–May 2002	–	Botswana Stock Exchange
Egypt	55	January 1997–May 2002	January 1997–May 2002	DataStream
Kenya	40	January 1997–May 2002	January 1997–May 2002	DataStream
Mauritius	9	June 1998–December 2002	June 1998–Dec 2002	DataStream
Morocco	36	January 1997–May 2002	January 1997–May 2002	DataStream
Namibia	17	August 1999–May 2002	–	Namibia Stock Exchange
Tunisia	35	January 1998–Dec 2002	October 1999–December 2002	Tustex/Tunisievaleurs/FMG
Zimbabwe	39	January 1997–May 2002	January 1997–May 2002	DataStream

allocated into one of three portfolios in two categories as follows: "SMALL, MEDIUM, LARGE" for size portfolios and "LOW, MEDIUM, HIGH" for P/E portfolios. No portfolio based on beta was formed. Again the limiting factor in this study is data, which only covers a very short horizon, with the longest period covered being 5 years and 5 months, that is, from January 1997 to May 2002 for Egypt, Morocco, Kenya, and Zimbabwe. However, since this is the first investigation, to the best of our knowledge, of the cross-sectional return predictability on these markets, the results would be, nevertheless, important and interesting.

3. EMPIRICAL RESULTS

3.1. The Size Effect

The results for the size effect are given in Table 2. The table does not show any clear pattern of a negative relation between size and average returns for all markets except Mauritius and Zimbabwe. For Mauritius, average returns are highest for the small-firm portfolio (0.70%) and lowest and negative for the large-firm portfolio (−0.14%) and thus a monthly size premium of 0.84% (or 10.08% annually). For Zimbabwe, average returns fall from 4.29% for the small-firm portfolio to 1.75% for the large-firm portfolio. This gives a monthly size premium as high as 2.54% (or 30.48% annually).

The positive relation between average returns and beta assumed by the Sharpe–Lintner–Black (SLB) model is not evident on these African markets for the size-sorted portfolios. Beta is only highest for high-return portfolios for Morocco and Namibia. For Botswana, Egypt, Kenya, and Mauritius, the highest beta is obtained for those portfolios that give the lowest returns, contrary to literature. There is no clear pattern for Tunisia and Zimbabwe, where the highest beta is obtained for medium-sized portfolios. Fama and French (1992) inferred that controlling for size, there is no relation between beta and average return for the period between 1963 and 1990 for US stocks.

The size effect is known, within the finance literature, to be associated with the January effect. This is because it is most pronounced in the month of January, suggesting a common underlying factor. In Table 3, the size effect (exhibiting a small-firm premium) is specific to January for Kenya and Morocco. The size effect for Zimbabwe is not specific to the month of January, although it is more pronounced in that month. In other countries, the size effect is found in months other than January. There is a size effect in

Table 2. Monthly Average Returns and Other Characteristics for Equally Weighted Portfolios Formed on the Basis of Size (Market Capitalisation).

Stock Market	Size-Sorted Portfolios	Average Returns (%)	Number of Stocks	ME (Local Currency in Millions)	P/E Ratios	Standard Beta	Trade-to-Trade Beta
Botswana	Small	1.70833	4	51.08992	–	0.08468	0.13144
	Medium	2.16828	4	280.13231	–	–0.00719	0.05358
	Large	2.07917	4	1570.00304	–	0.06217	0.06392
Egypt	Small	−1.48686	18	33.79866	6.08957	0.38649	0.49076
	Medium	−1.12865	18	144.82805	10.37294	0.34087	0.33916
	Large	−1.67006	19	1225.60796	18.97144	0.60575	0.58636
Kenya	Small	−1.20353	13	208.79225	8.77217	0.33722	0.53508
	Medium	−1.06860	13	1057.64948	9.12102	1.01178	1.00085
	Large	−1.51533	14	6341.40614	14.24702	1.01096	1.03869
Mauritius	Small	0.70301	3	812.62500	5.96204	0.67161	0.65754
	Medium	0.33678	3	2529.58130	7.47469	0.94671	0.95059
	Large	−0.14795	3	5098.42037	9.05185	1.37249	1.38847
Morocco	Small	−0.14390	11	160.58138	52.20249	0.51068	0.68319
	Medium	−0.06099	12	1111.41344	25.89973	0.64833	0.74293
	Large	−0.04017	12	6908.46503	29.98346	1.03632	1.02529
Namibia	Small	−1.52625	5	12.93883	–	0.00229	0.01292
	Medium	−2.39963	6	258.69164	–	0.09673	0.64461
	Large	0.49657	6	10863.05094	–	0.55331	0.70343
Tunisia	Small	−0.28981	11	13.13075	19.24579	0.22996	0.21440
	Medium	0.32735	11	48.49088	13.18172	0.28578	0.27459
	Large	−0.12365	11	200.01306	12.86282	0.42953	0.46126

Table 2. *(Continued)*

Stock Market	Size-Sorted Portfolios	Average Returns (%)	Number of Stocks	ME (Local Currency in Millions)	P/E Ratios	Standard Beta	Trade-to-Trade Beta
Zimbabwe	Small	4.28918	13	130.30565	7.63346	0.73819	0.85979
	Medium	3.22538	13	540.68894	7.99712	0.93345	0.93088
	Large	1.74794	13	6771.00055	1865.46007*	0.86895	0.86076

Note: Portfolios are formed quarterly with the stocks sorted by the market capitalisation of the month preceding each quarter and their equal-weighted returns calculated for the next 3 months. The average return (in percentage) is the time-series average of the monthly equal-weighted portfolio returns. Beta is a time-series average of the monthly portfolio betas. These portfolio betas are obtained by averaging the individual firm betas. We report both the standard betas and the trade-to-trade betas.

*The P/E ratios for this portfolio are very high due to the high P/E ratios for Ashanti, especially for the last 6 months of the series.

Table 3. Average Returns (%) for Size-Sorted Portfolios by Month of the Year.

Stock Market	Size-Sorted Portfolios	January	February	March	April	May	June	July	August	September	October	November	December
Botswana	Small	−1.9881	2.9739	0.3158	5.7073	4.7035	−2.2367	5.1452	0.7030	0.9324	−0.2379	0.6144	2.1186
	Medium	1.0334	−3.2512	1.8045	2.2140	3.1839	7.9896	2.7724	4.1514	−1.2120	1.0458	4.5938	1.4285
	Large	1.3126	4.5897	10.2909	3.0474	−4.9099	0.1738	5.2089	12.6567	−8.1061	3.6976	0.2420	−1.7483
Egypt	Small	2.2941	4.8492	−5.9067	−0.5613	−4.9818	−7.4567	−4.3907	0.3234	0.0944	−1.8702	−1.4411	1.3359
	Medium	4.8049	−1.3873	−4.0455	−2.4144	−3.2511	−3.4385	−4.7010	1.7166	0.3625	−0.1172	−1.6554	1.8995
	Large	4.0208	−1.4048	−2.5991	−1.4504	−5.2679	−4.7217	−5.5967	0.0881	1.9651	−1.1646	−3.0132	−0.0880
Kenya	Small	4.6926	0.1746	−2.6746	-3.6968	−1.0319	−0.4338	−2.5511	−1.6976	−2.4692	−0.5723	−3.3439	−0.3554
	Medium	3.4125	−0.1364	−1.1367	−4.4150	0.0333	−1.4245	−1.1582	−5.1120	−1.9123	0.9906	−2.9130	1.2244
	Large	1.2381	0.4637	−7.7175	−1.8441	−1.0921	0.5524	−0.8415	−3.7618	−1.7864	−1.8903	−3.0167	2.3382
Mauritius	Small	3.2926	0.9277	−3.8405	−1.2530	0.4809	3.7416	0.2864	0.8322	−0.0111	0.9907	1.4275	1.3874
	Medium	2.1362	−1.4018	0.5825	−0.8811	−0.4743	3.5591	1.6394	−0.5237	−1.2134	−1.4632	0.2971	2.0845
	Large	2.5326	−1.3591	−1.2637	−2.6388	−0.8520	1.5448	2.0958	−1.0262	−3.3922	−0.4980	1.9892	0.8625
Morocco	Small	1.9880	−0.2846	0.9834	0.5968	−1.9378	−1.6454	0.0439	1.7905	−0.1854	−1.1007	−1.0890	−0.8730
	Medium	−0.9396	1.3507	1.2357	1.6200	−1.4934	-0.8914	−1.2875	2.7957	−1.2093	−2.5424	−1.5127	1.5509
	Large	−1.2872	2.8236	1.7458	0.4406	−1.6461	1.1786	−1.1246	3.9778	−2.3846	−2.8305	−0.2079	−1.8724
Namibia	Small	−2.9001	0.4393	−2.3460	−0.4600	2.2988	−1.7520	7.1728	−3.1705	0.6602	1.0944	−14.6985	−2.3772
	Medium	1.6968	−5.1861	−4.1677	−3.2174	−3.3165	3.1623	0.1716	−8.3371	−5.1244	−7.8712	2.5097	1.6163
	Large	0.0804	−0.9025	−2.7009	−1.8535	−0.9355	6.2932	0.4600	0.2383	−2.0740	−1.0890	3.2397	7.0366
Tunisia	Small	1.7014	−0.0690	−0.3616	−0.8522	0.1514	−2.8366	−0.3040	−0.9559	0.0416	−0.5010	−1.8871	2.7936
	Medium	0.5054	0.4290	−1.9591	−1.5153	0.9922	−0.6244	0.2290	0.0384	1.3311	2.5905	0.9380	1.0093
	Large	3.1934	2.5087	−1.0469	−0.9236	−0.6806	−2.7608	0.1654	1.3657	−0.6660	−1.3054	−0.9284	0.2581
Zimbabwe	Small	22.2239	2.5858	7.4982	3.2251	4.4970	5.7787	0.8798	−0.1523	1.7034	1.4792	2.9875	−1.3660
	Medium	21.2728	−0.5468	5.6380	0.0772	3.5448	5.4118	5.9706	−4.0006	−0.5085	3.0432	2.9396	−3.2998
	Large	12.2523	−2.8527	8.3309	−1.3327	3.0034	4.8720	3.2391	−4.5709	6.1596	−4.4910	−1.3652	−2.3010

May and December for Botswana, in February and July for Egypt, in May, June, August, and September for Mauritius, and in December for Tunisia. For Namibia, there is no visible size effect specific to any of the months.

3.2. P/E-Sorted Portfolios

In the literature covering the role of P/E ratios in explaining average returns, the inverse of the P/E ratio, the E/P ratio is sometimes used. While with the E/P, the hypothesis is that of a positive relation between E/P and average return; with the P/E ratio, a portfolio of low-P/E stocks is expected to give higher returns than the other portfolios. This relation of low-P/E ratio stocks giving high average returns, as hypothesised in the literature for some developed markets, is also evident for some African markets (see Table 4). For Egypt and Kenya, although average returns are negative for all stocks, the loss on the low-P/E portfolios is the lowest, while it is the highest for the high-P/E portfolio. For Morocco, the low-P/E portfolio gives a positive return of 0.23% and the loss on the high-P/E portfolio is higher than that on the medium-P/E portfolio.

While there is no clear pattern for Mauritius, a reversed low-P/E ratio–high average return relation is observed for Tunisia and Zimbabwe. For Tunisia, while all average returns are negative, implying, on average, a loss on each portfolio value, the loss is highest for the low-P/E portfolio and lowest for the high-P/E portfolio. For P/E-sorted portfolios, there is no clear pattern between average returns and beta for all the markets except Egypt. However, for Egypt, it is the high-P/E portfolio with the lowest returns that gives the highest beta.

An investigation was carried out to determine if the P/E effect is specific or most pronounced in January. The results of this investigation are presented in Table 5. The results show a P/E effect in January for Mauritius and Zimbabwe. While for Zimbabwe the P/E effect is specific to January, for Mauritius the effect is also evident in June. None of the remaining markets exhibits a P/E effect in January. Egypt exhibits a P/E effect in December, Kenya in May and October, Morocco in June and July, and Tunisia in June.

3.3. Cross-Sectional Regressions

In Table 6, results of the month-by-month regressions are presented. The table shows that none of the average slopes are significantly different from zero. However, almost all the slopes are positive for size and the P/E ratio, contrary to the expected negative slopes. This shows that reversed size and

Table 4. Monthly Average Returns and Other Characteristics for Equally Weighted Portfolios Formed on the Basis of Price-Earnings Ratios.

Stock Market	P/E-Sorted Portfolio	Average Returns (%)	Number of Stocks	P/E Ratios	ME (Local Currency in Millions)	Standard Beta	Trade-to-Trade Beta
Egypt	Low	–1.39625	15	4.14780	107.24145	0.42942	0.47742
	Medium	–1.56587	16	7.90272	445.47530	0.48399	0.47955
	High	–2.09158	16	24.46597	1030.19617	0.53273	0.53390
Kenya	Low	–0.52245	11	4.36725	1793.09674	0.78207	0.88756
	Medium	–1.15079	11	7.29587	2994.18237	0.69507	0.79089
	High	–1.51553	12	20.40053	3717.48951	0.77491	0.83251
Mauritius	Low	0.39446	3	4.22932	1725.44994	0.74747	0.75498
	Medium	0.18046	3	7.25247	3571.21435	1.02383	1.03497
	High	0.39795	3	11.17037	3803.50611	1.23667	1.23258
Morocco	Low	0.22926	10	11.20220	1845.59381	0.74377	0.82471
	Medium	–0.09479	10	18.58739	3670.98013	0.78271	0.80663
	High	–0.24565	11	70.98956	3583.13845	0.73479	0.81199
Tunisia	Low	–0.45301	10	7.93320	84.68352	0.31352	0.31801
	Medium	–0.41043	10	10.54709	98.20028	0.25869	0.24491
	High	–0.35635	11	24.09901	106.56017	0.39665	0.37525
Zimbabwe	Low	2.49599	11	3.21554	444.94813	0.88272	0.92966
	Medium	3.05050	11	6.67285	1136.51462	0.91083	0.96079
	High	3.37475	12	1609.99768	5764.60969	0.81844	0.80973

Note: Portfolios are formed quarterly with the stocks sorted by the PE ratios of the month preceding each quarter.

Table 5. Average Returns (%) of P/E-sorted Portfolios by Month of the Year.

Stock Market	P/E-Sorted Portfolios	January	February	March	April	May	June	July	August	September	October	November	December
Egypt	Low	4.3081	3.6022	–7.2689	–4.3699	–5.6038	–5.2634	–4.3203	3.3795	0.2853	–1.1973	–0.6786	1.9832
	Medium	3.3825	–1.8925	–2.3652	0.4885	–4.6302	–3.5053	–5.3353	–0.6828	0.4369	–2.2054	–2.1051	0.0506
	High	3.3964	–1.3677	–5.8469	–1.4411	–4.7039	–6.4980	–5.4594	0.9778	0.5504	–1.3808	–2.2681	–0.0590
Kenya	Low	4.6544	0.3371	–3.5841	–4.1370	3.7529	–0.0492	1.0360	–3.2642	–3.3445	0.1663	–1.4790	–0.0498
	Medium	2.9157	–0.2065	–5.0812	–2.3511	2.1079	–1.5342	–2.1824	–3.7012	–1.7858	–0.0527	–2.9997	1.2472
	High	3.0005	1.3764	–3.2145	–3.0446	–4.7393	1.3242	–1.2796	–1.9072	–1.0794	–3.7007	–5.8072	1.5969
Mauritius	Low	4.0862	–0.9291	–2.0510	–1.4061	–1.1129	4.9925	1.2871	0.0813	–0.3868	–0.7582	0.6534	0.5198
	Medium	2.7400	–0.8333	–1.7519	–2.9630	1.7080	2.6084	1.9259	–0.7496	–3.0466	0.8568	0.6283	1.1276
	High	1.9547	–0.2457	0.7568	–0.6500	–1.2483	2.2227	1.1827	–1.1869	–1.7010	–0.7276	1.2986	3.1998
Morocco	Low	–0.0757	1.3322	0.9120	0.9231	–1.4154	1.6343	–0.4079	4.0354	–0.7624	–1.4653	–1.4776	–0.6485
	Medium	0.1465	2.1309	1.0857	0.8174	–1.3409	0.8286	–0.6415	1.9758	–1.8579	–3.1638	–0.9221	–0.8106
	High	–0.5261	1.2520	1.5228	1.0127	–1.9703	–1.8665	–2.0377	3.2644	–1.5550	–2.5319	–0.2501	0.1778
Tunisia	Low	1.8801	–3.2002	–1.7607	–1.0117	1.7107	–2.1653	–0.7875	–1.0049	–0.3394	–0.6490	0.5456	0.6467
	Medium	0.2771	–2.6839	0.0993	0.0863	–0.0991	–3.0602	–0.8314	–0.4831	–0.0846	–1.1759	1.2122	0.8553
	High	3.1895	–2.7778	–2.4254	–2.8440	1.7118	–3.2858	2.8582	–1.7836	0.0828	–0.4810	–2.4708	3.4020
Zimbabwe	Low	22.0842	–1.7963	4.5884	0.3771	5.1209	4.7431	1.4350	3.2447	–4.1495	–2.2450	–1.1508	–1.9612
	Medium	19.3070	1.9313	8.3035	2.7454	2.9009	4.5287	5.0161	–10.1050	0.7241	1.6319	3.1735	–4.2871
	High	15.5021	–3.1296	7.8482	–0.4425	5.2545	5.4596	4.9486	–3.2888	7.8026	–0.1823	3.0718	–1.5538

Table 6. Month-by-Month Regressions of Stock Returns on Beta, Firm Size, and Price-Earning Ratios.

Stock Market	Regression Equation	Intercept			Trade-to-Trade Beta			Ln(ME)			P(+)/E		
		Coeff.	Std. Err.	*t*-Stat	Coeff.	Std. Err.	*t*-Stat	Coeff.	Std. Err.	*t*-Stat	Coeff.	Std. Err.	*t*-Stat
Egypt	1	–0.0022	0.0543	–0.0403	–0.0256	0.1276	–0.2007						
	2	–0.0337	0.1091	–0.3089				0.0042	0.0171	0.2429			
	3	–0.0277	0.0610	–0.4533							0.0018	0.0036	0.5091
	4	–0.0230	0.0966	–0.2380	–0.0301	0.1328	–0.2268	0.0049	0.0186	0.2645			
	5	–0.0134	0.0539	–0.2492	–0.0275	0.1286	–0.2136				0.0017	0.0035	0.4983
	6	–0.0415	0.1349	–0.3075				0.0037	0.0235	0.1570	0.0011	0.0040	0.2687
	7	–0.0290	0.1096	–0.2646	–0.0294	0.1306	–0.2254	0.0043	0.0240	0.1805	0.0009	0.0041	0.2188
Kenya	1	–0.0064	0.0482	–0.1330	–0.0073	0.0651	–0.1117						
	2	–0.0326	0.0967	–0.3376				0.0030	0.0138	0.2155			
	3	–0.0145	0.0469	–0.3095							0.0002	0.0033	0.0747
	4	–0.0285	0.0956	–0.2979	–0.0122	0.0672	–0.1811	0.0040	0.0140	0.2827			
	5	–0.0143	0.0606	–0.2362	0.0006	0.0563	0.0111				0.0001	0.0035	0.0414
	6	–0.0313	0.0990	–0.3156				0.0027	0.0141	0.1901	0.0001	0.0036	0.0212
	7	–0.0284	0.0991	–0.2863	–0.0053	0.0575	–0.0922	0.0031	0.0139	0.2236	–0.0001	0.0037	–0.0320
Morocco	1	–0.0041	0.0343	–0.1198	0.0038	0.0608	0.0627						
	2	–0.0083	0.0627	–0.1318				0.0011	0.0099	0.1128			
	3	–0.0069	0.0468	–0.1484							0.0004	0.0020	0.2026
	4	–0.0083	0.0648	–0.1277	0.0022	0.0614	0.0353	0.0009	0.0098	0.0880			
	5	–0.0081	0.0524	–0.1549	0.0017	0.0624	0.0266				0.0004	0.0021	0.1834
	6	–0.0119	0.0743	–0.1605				0.0007	0.0107	0.0687	0.0004	0.0021	0.1882
	7	–0.0102	0.0766	–0.1336	–0.0018	0.0618	–0.0294	0.0007	0.0115	0.0632	0.0004	0.0023	0.1644

Table 6. *(Continued)*

Stock Market	Regression Equation	Intercept			Trade-to-Trade Beta			Ln(ME)			P(+)/E		
		Coeff.	Std. Err.	*t*-Stat	Coeff.	Std. Err.	*t*-Stat	Coeff.	Std. Err.	*t*-Stat	Coeff.	Std. Err.	*t*-Stat
Tunisia	1	–0.0027	0.0270	–0.0987	0.0082	0.0779	0.1048						
	2	–0.0124	0.0582	–0.2132				0.0032	0.0147	0.2162			
	3	–0.0060	0.0259	–0.2308							0.0002	0.0016	0.1193
	4	–0.0116	0.0586	–0.1976	0.0037	0.0818	0.0452	0.0027	0.0147	0.1865			
	5	–0.0023	0.0224	–0.1024	–0.0006	0.0864	–0.0072				0.0000	0.0015	–0.0140
	6	–0.0175	0.0618	–0.2824				0.0027	0.0143	0.1856	0.0002	0.0016	0.1502
	7	–0.0157	0.0667	–0.2357	–0.0079	0.0955	–0.0822	0.0038	0.0163	0.2342	0.0000	0.0015	0.0307
Zimbabwe	1	0.0382	0.1305	0.2929	–0.0083	0.1906	–0.0437						
	2	0.0000	0.1983	–0.0002				0.0054	0.0259	0.2086			
	3	0.0052	0.1302	0.0396							0.0038	0.0048	0.7791
	4	0.0054	0.2066	0.0262	–0.0066	0.1908	–0.0347	0.0055	0.0260	0.2102			
	5	–0.0085	0.1471	–0.0576	0.0143	0.2116	0.0676				0.0038	0.0047	0.7982
	6	0.0087	0.2204	0.0395				0.0002	0.0288	0.0064	0.0034	0.0063	0.5434
	7	–0.0016	0.2154	–0.0075	0.0155	0.2170	0.0714	–0.0003	0.0294	–0.0099	0.0034	0.0060	0.5607

Note: The coefficients are time-series averages of the monthly regression slopes for the periods investigated. Also reported in the table are the time-series standard errors and *t*-statistics of the average slopes, whereby the *t*-statistic is calculated as the average slope divided by its time series standard error.

P/E effects are present on these markets although they are not significant. The results support those given in Tables 2 and 4 where the large-stock and high-P/E portfolios, respectively, give the highest returns in most markets. For beta, 12 out of 20 slopes are negative. This also supports results in Tables 2 and 4 where high betas seem not to be associated with high returns.

According to Fama and French (1992), firms with low ME (small-size firms) are more likely to have poor prospects, resulting in low stock prices (and high book-to-market equity). Conversely, large stocks are more likely to be firms with stronger prospects, higher stock prices, lower book-to-market equity, and lower average stock returns. Variables, for instance, size, E/P, leverage, and book-to-market equity, are all scaled versions of a firm's stock price. From the Fama–MacBeth regressions, Fama and French found that size, on average, has a negative premium in the cross-section of stock returns and that the average premium for the market beta is essentially zero.

Evidence in Table 7 shows some correlation between some of the explanatory variables used in this paper. For the month-by-month

Table 7. Correlation Coefficients between Variables.

Stock Market		Month-by-Month Correlations		
		Beta	ln(ME)	P(+)/E
Egypt	Beta	1.00		
	ln(ME)	0.09 [0/64]	1.00	
	P(+)/E	0.04 [0/64]	0.38 [41/64]	1.00
Kenya	Beta	1.00		
	ln(ME)	0.37 [9/64]	1.00	
	P(+)/E	0.11 [6/64]	0.24 [6/64]	1.00
Morocco	Beta	1.00		
	ln(ME)	0.51 [64/64]	1.00	
	P(+)/E	−0.20 [0/64]	0.03 [0/64]	1.00
Tunisia	Beta	1.00		
	ln(ME)	0.40 [33/59]	1.00	
	P(+)/E	−0.01 [2/39]	−0.14 [2/39]	1.00
Zimbabwe	Beta	1.00		
	ln(ME)	−0.02 [0/64]	1.00	
	P(+)/E	−0.18 [8/64]	0.46 [50/64]	1.00

Notes: Beta is the trade-to-trade beta, ln(ME) is the natural log of market capitalisation, and P(+)/E refers to positive price-earnings ratios, for the period under consideration.
Values in parenthesis indicate the number of months with significant correlation coefficients as a proportion of total number of months in the sample.

correlations, the P/E ratio and size are relatively correlated for Egypt (0.38) and for Zimbabwe (0.46). Size is also correlated with beta for Morocco (0.51) and for Tunisia (0.40). The picture given by the correlation matrix can help us to understand some of the results discussed in the previous subsections. For example, the size effect for Morocco could be in actual fact a beta effect in disguise.

4. CONCLUSION

The paper investigates the relationship between stock returns and beta, firm size and price-earnings ratios on selected African stock markets for the period between 1997 and 2002. Although the period examined is relatively short in comparison to periods investigated in this kind of research for other markets due to data problems on African stock markets, the results are interesting. The effects observed are broadly opposite to those assumed in the literature. A large-firm premium is mostly observed, resulting in a reversed size effect. For the P/E effect it is mostly the high P/E portfolios that give the highest returns. These results, as provided by the portfolio analyses, are also found using the regression method, where positive slope coefficients are observed for both size and the P/E ratio. In the month-by-month regressions, however, none of the average slope coefficients are significant.

There is however, a need for follow-up studies on these effects for African stock markets using longer sampling periods and data that do not suffer from survivorship bias. In addition, as the stock markets become larger, in terms of number of listed stocks, portfolios should be formed using deciles, to make clear distinctions between large- and small-size portfolios and between low-P/E and high-P/E portfolios. It is also important to investigate the causes of the reversed effects observed in this study, and the explanations thereof. Why is it the case that high risk is associated with low returns on African markets? Why is there a large-firm premium or reversed small-firm effect on African markets? What explains the fact that high P/E stocks give the highest returns?

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COMPANY FINANCIAL STRUCTURES IN EMERGING ECONOMIES: EVIDENCE FROM A COMPARATIVE ANALYSIS OF THAI AND MALAY COMPANIES

Sanjiva Prasad, Christopher J. Green and Victor Murinde

ABSTRACT

We analyse the financial structure of Malay and Thai non-financial companies using a unique, new company accounts panel data set. Taking the basic Reduced Form Capital Structure Model (RFCSM) as the point of departure, we innovatively specify an Augmented Capital Structure Model (ACSM), which provides a composite representation of the patterns of company financing by encompassing debt, equity and retained earnings. We estimate the model using three data sets: historic cost accounts, Last-in-First-Out (LIFO) inflation-adjusted accounts and First-in-First-Out (FIFO) inflation-adjusted accounts. We find that a relatively high proportion of asset growth is internally financed in both Malaysia and Thailand, mainly through retentions, although inflation-adjusting the accounts increases the level of equity financing. In addition, although the

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evidence generally supports the pecking-order hypothesis, there is also evidence to suggest a 'reversed pecking order' of finance. We also find that while there is evidence of over-gearing by unprofitable firms in both countries, the risk of bankruptcy has a non-linear influence on leverage, as postulated by the traditional school. These findings have important implications for firms in considering their financing decisions.

1. INTRODUCTION

The inspiration for this paper derives from a simple observation of the reality in most developing countries, namely that companies must be able to exploit all options of financing their activities if they are ever to grow and play a predominant role in: creating value-added; providing employment as well as income in terms of profits, dividends and wages to households; expand the size of the directly productive sector in the economy; and generate tax revenue for the government. Arguably, therefore, well-financed and growing companies may indirectly contribute to poverty reduction through fiscal transfers and income from employment and company ownership.

But how do companies finance their existing activities in order to grow over time? Since inflationary pressures in developing countries tend to erode the value of assets and incomes from company investments, does adjustment for inflation in company accounts explain variations in financing choices? As Prasad, Green, and Murinde (2001) have shown in a review of the relevant theoretical and empirical literature, very little is known about the patterns of company financing in developing countries. Singh and Hamid (1992) have shown that companies in a sample of nine developing countries made significant use of external finance, particularly equity, to finance their growth. However, most of the existing literature explains company financing behaviour in terms of leverage only and does not consider equity and retained earnings; see, for example, the work by Rajan and Zingales (1995) on many economies and Cornelli et al. (1996) on Central and Eastern Europe. Moreover, all these studies use company data in which variables are measured at historic cost accounts, notwithstanding the deleterious effect of high inflation on the value of assets and income from company investments, over time, in most developing countries.

In this paper, we propose and implement a plausible framework for providing a deep insight into the financing behaviour of companies in developing countries, with particular reference to Malay and Thai companies.

The main contributions of the paper are twofold. First, we go beyond the existing literature by explaining the financing behaviour of the company using not only leverage but also equity and retained earnings. We specify an Augmented Capital Structure Model (ACSM), which encompasses debt, equity and retained earnings. We argue that the ACSM model provides a composite representation of the patterns of company financing. Second, a major innovation is that we inflation-adjust the reported accounts to correct for potential biases in our results due to inflation; we then estimate the model using all three data sets: historic cost accounts, Last-in-First-out (LIFO) inflation-adjusted accounts and First-in-First-out (FIFO) adjusted accounts. Moreover, in its own right, this approach is a methodological contribution to the empirical corporate finance literature.

In what follows, the rest of the paper is structured into four parts. Section 2 discusses the characteristics of Thai and Malay companies and thus sheds light on the sample and data. Section 3 outlines the reduced form model variants used in this study. The estimation and testing results are reported and discussed in Section 4. Section 5 summarises the main findings.

2. DATA AND MEASUREMENT CHARACTERISTICS OF THAI AND MALAY COMPANIES

Malay and Thai accounting standards adhere quite closely to international standards. However, there remains substantial variation in the standards of financial reporting as well as the availability of company reports for these countries. Company accounts data for Malaysia and Thailand are collected and published by several commercial information services, including the *Annual Companies Handbook* (Malaysia only), the *Emerging Markets Database of the International Finance Corporation*, *Extel*, *Moodys*, *Disclosure* and *Datastream*. The general scope of each of these databases is summarised in Table 1. To try to ensure that the basic data were as reliable as possible, we only used companies whose accounts were published in at least three of these sources. We cross-checked these sources wherever possible and discarded companies whose data contained unreconcilable inconsistencies, such as balance sheets that did not balance, presumably because of data input errors. By this process we arrived at a sample of 165 Malaysian companies and 174 Thai companies, each of which reported at least once over the period 1987 through 1995. As shown in Table 2, this represents a substantial proportion of the total population of quoted companies in each of the two countries.

Table 1. Secondary Sources of Company Data for Malaysia and Thailand.

Source	Advantages	Limitations
Annual Companies Handbook (Malaysia only)	Large number of companies Large number of years per firm Gives shares held by directors Gives the percentage of shares held by 10 largest shareholders	Listed companies only Securities not distinguished by instrument No break down of operating costs Non-SIC industrial classifications No notes to accounts No sources – uses statement
Emerging Markets Database (IFC)	Large number of companies Large number of years per firm Two-digit SIC industrial classification	Manufacturing firms only No notes to accounts No break down of operating costs No sources – uses statement Securities not distinguished by instrument Directors' shares not given Percentage of shares held by 10 largest shareholders not given
Extel	Large number of companies Gives shares held by directors Gives the percentage of shares held by largest shareholders Four digit SIC industrial classification Some securities distinguished by instrument	Small number of years per firm No notes to accounts No break down of operating costs No sources – uses statement
Moodys	Large number of companies Four-digit SIC industrial classification Some securities distinguished by instrument Break down of operating costs	Small number of years per firm No notes to accounts No sources – uses statement Directors' shares not given Percentage of shares held by 10 largest shareholders not given

Disclosure	Large number of companies Four-digit SIC industrial classification Break down of operating costs	Small number of years per firm No notes to accounts No sources – uses statement Directors' shares not given Percentage of shares held by 10 largest shareholders not given Securities not distinguished by instrument
Datastream	Large number of companies	Small number of years per firm No notes to accounts No sources – uses statement Directors' shares not given Percentage of shares held by 10 largest shareholders not given Securities not distinguished by instrument No SIC industrial classifications

Table 2. Sample Characteristics.

	Malaysia	Thailand
Total companies quoted on local stock exchange (1990)	282	214
Prasad, Green, and Murinde Sample (1987–1995)		
Sample companies	165	174
Average number of years data per company	7.8	5.4
Total number of observations	1,296	932214
Industrial composition: number of companies (% of total)		
Agriculture	20.61	3.45
Oil, gas, and nuclear fuels	1.21	0.57
Mines	1.21	2.30
Food manufacturing	9.09	9.77
Brewers and distillers	1.82	0.00
Tobacco	0.61	0.00
Textiles	0.61	10.92
Building materials and services	10.91	5.17
Packaging	3.64	2.30
Chemicals	1.82	4.60
Health and household	2.42	9.77
Metal and metal forming	4.85	7.47
Engineering general	3.64	2.30
Electricals	1.82	5.17
Other industrial materials and products	6.67	6.32
Contracting and construction	3.03	0.00
Food wholesaling and retailing	1.21	0.57
Stores	0.61	0.57
Hotels and leisure	1.82	5.75
Transport, manufacture, and distribution	2.42	4.02
Communications	0.61	0.57
Property	4.85	5.17
Media	0.00	4.02
Conglomerates	7.27	0.00
Miscellaneous	7.27	9.20

Table 2 also gives the industrial composition of the sample, based on the *Extel* classification (1996). We excluded financial companies as their financial structure decisions are substantially different in nature from those of non-financial companies. Otherwise, we did not rule out any particular industrial sector. This is a departure from Singh and Hamid (1992), Singh (1995) and other recent studies of corporate financing decisions in developing countries, in which the emphasis has been almost exclusively on manufacturing firms. The risks inherent in such an approach are readily apparent from Table 2, where only 48% of our Malay sample and 64% of our Thai sample are manufacturing companies. Of course, this does mean that any comparison between the two samples needs to be undertaken with care. Measured inter-country differences could simply reflect inter-industry differences, rather than any true differences in corporate behaviour between the two countries. However, given the size of each sample, the sample is likely to be quite representative of the quoted non-financial companies in each country, and this underlines the need to extend financial structure research from manufacturing to a broader range of companies.

Like most worldwide, Malay and Thai companies report their accounts by valuing assets and liabilities at historic cost and using conventional accounting depreciation methods. Historic cost accounting poses well-known problems of interpretation, although there is little agreement on a preferred alternative method. A major innovation in this paper is that we use two different methods to inflation-adjust the reported accounts to correct for potential biases in our results due to inflation. There is a substantial literature on historic cost accounting and the merits and demerits of inflation-adjusted accounting; see Whittington (1983) for a review and Edwards, Kay and Mayer (1987) for an analysis of different proposals to implement inflation adjustments.

We adopt the 'entity' approach to inflation adjustment, which seeks to identify that level of real capital at the end of the previous period, which will just sustain the firm's operating capacity through to the end of the current period. Any increase (or decrease) in real capital thus defined, from the end of the previous period to the end of the current period, is identified as the company's profit (or loss) during the current period. Sustainable capital is calculated by adjusting the published accounts for profits or losses associated with the following: the difference between historic and real depreciation, inventory appreciation, real holding gains or losses arising from changes in the price of the firm's fixed assets and real holding gains or losses associated with monetary assets and liabilities.

A minimum assumption needed to implement these adjustments in any realistic setting is that reported stocks of assets and liabilities are homogeneous within each reporting category, and this is an assumption we make. Even with this assumption, inflation adjustments can be done in several ways depending, in particular, on the method of inventory valuation in the accounts. The national accounting standards for Malay and Thai companies follow international standards and permit the use of either LIFO or FIFO inventory valuation. Information about inventory valuation is usually contained in the notes to the accounts (see Table 1); these were mostly unavailable. Accordingly, we were unable to identify the inventory valuation procedures on a company-by-company basis. Therefore, we proceeded by assuming first that all inventories were valued on a LIFO basis and second that all inventories were valued on a FIFO basis. This gives three data sets: historic cost accounts, LIFO inflation-adjusted accounts and FIFO adjusted accounts. We then estimated the model on all three versions of the data.

Summary statistics for the sample companies are given in Table 3a,b, together with some comparative data extracted from Singh (1995) who studied the 100 largest quoted companies in a sample of 10 developing economies. These statistics consist of simple performance indicators as well as financing and capital structure measures. In compiling these statistics for our sample, we have used the same methods as Singh (1995), mainly in order to aid in making comparisons with his work.[1] However, in one important respect, our statistics are not directly comparable with Singh (1995). For most statistics, Singh (1995) first time-averaged the raw profit and loss and balance sheet data separately for each company, and then calculated the financial ratios for each company. Finally, these ratios were averaged across companies to produce the mean ratios shown in the last three columns of Table 3a.[2] We preferred to calculate each indicator for each company year by year. We then calculated the unweighted mean and median across time and companies for each country in a single step. Calculating the unweighted mean of ratios can lead to occasional distortions. This happened, for example, in Thailand where some companies had relatively small pre-tax profits in the sample, and this produced mean retention ratios well in excess of unity. Likewise, the inflation adjustments sometimes generated negative denominators for net asset growth. Accordingly, we place more reliance on the medians as a more stable benchmark against which to compare the statistics by Singh (1995) with our own.

In general, the balance sheet ratios, which reflect the companies' whole financial history, are reasonably comparable when considering the data by Singh (1995) and our own. However, there are more substantial differences among the flow measures of financing. Our data for Malaysia are more in line with the conventional wisdom for industrial countries, that a relatively high proportion of asset growth is internally financed. Unlike Singh (1995), our data show that retentions finance a substantially higher proportion of asset growth than does equity. Retentions also finance a higher proportion of asset growth than equity in Thailand, where Singh (1995) has insufficient data. Inflation-adjusting the accounts has interesting effects for both Malaysia and Thailand. The median share of equity financing rises significantly.

Table 3a. Company Characteristics: Performance and Capital Structure Measures.

	Prasad, Green, and Murinde						Singh (1995)		
	Malaysia			Thailand			Malaysia	Thailand	All
	HC	FIFO	LIFO	HC	FIFO	LIFO	HC	HC	HC
ROBE									
Mean	0.144	0.135	0.090	0.211	0.281	0.283	0.103	0.077	0.111
Median	0.132	0.126	0.131	0.206	0.244	0.246			
ATRR									
Mean	0.967	0.187	0.213	19.25	12.35	11.25	0.517	0.487	0.629
Median	0.433	0.606	0.656	0.385	0.429	0.373			
IFG									
Mean	0.514	1.874	0.557	0.859	2.394	0.389	0.297	na	0.320
Median	0.673	0.410	0.434	0.353	0.201	0.169			
EFGD									
Mean	0.195	0.162	0.074	0.295	−0.913	0.224	0.120	na	0.160
Median	0.000	0.000	0.000	0.020	0.000	0.000			
EFGE									
Mean	0.290	−1.037	0.368	−0.154	−0.482	0.388	0.480	na	0.411
Median	0.127	0.303	0.253	0.217	0.705	0.735			
CGNA									
Mean	0.119	0.074	0.075	0.136	0.347	−0.269	0.103	0.558	0.186
Median	0.023	0.020	0.020	0.069	0.091	0.089			
CGNW									
Mean	0.129	0.105	0.107	0.238	0.554	0.598	0.127	1.284	0.237
Median	0.024	0.018	0.018	0.075	0.073	0.071			
VAL									
Mean	2.177	2.235	2.297	3.283	7.470	12.75	1.97	na	1.3
Median	1.732	1.714	1.729	2.267	2.706	2.693			

Notes:
HC, historic cost; FIFO, first in first out; LIFO, last in first out.
Singh's data are for the 100 largest companies in Malaysia and Thailand. 'All' is an average of the largest companies in 10 developing countries: 100 companies for six of these countries and a smaller number for the remaining four.

Since the main effect of the inflation adjustments in practice is to reduce the growth in nominal assets, these results suggest that, in times of inflation, equity finance is used indirectly to shore up companies' cash and liquidity. This tentative conclusion goes some way towards restoring the original finding by Singh and Hamid (1992) that developing country firms do tend to use more equity finance than their industrial country counterparts. However, if our argument is correct, the underlying reason for the greater level of

Table 3b. Definitions of Variables.

Measure	Mnemonic	Definition
Return on book equity	ROBE	EBT/shareholders' funds
After tax retention ratio	ATRR	[EAT – (ordinary + preference dividends)]/EBT
Internal finance	IFG	Retained earnings/ΔNet assets
External finance: long-term debt	EFGD	ΔLong-term debt/ΔNet assets
External finance: equity	EFGE	1 – IFG – EFGD
Capital gearing (net assets)	CGNA	Long-term debt/net assets
Capital gearing (net worth)	CGNW	Long-term debt/net worth
Valuation ratio	VAL	Market value of equity/net worth

Notes:
EBT, earnings before tax; EAT, earnings after tax.
Share price used to value equity is the average of the highest and lowest prices over the year.

equity financing is to stave off liquidity problems and not the buoyancy of the domestic capital market.

3. THE EMPIRICAL MODEL

3.1. The Basic (Reduced Form) Company Financial Structure Model

In this paper, we estimate two separate models of financial structure for companies in each of Thailand and Malaysia: a basic reduced form model, the Reduced Form Capital Structure Model (RFCSM), and an augmented model. We compare the models using standard diagnostics.

Beginning with the RFCSM, for each country, we estimate a single linear regression model of the form

$$y^*_{i,t} = \sum_j \beta_j X_{i,j} + \sum_k \gamma_k Z_{i,k} + \varepsilon_{i,t} \tag{1}$$

where $y^*_{i,t}$ is a measure of the financial structure of the ith firm ($i = 1,\ldots,I$) at time t; $X_{j,t}$ are J ($j = 1,\ldots,J$) general variables (including unity) that theory would suggest may help determine inter-temporal and cross-sectional differences in financial structure; $Z_{k,t}$ are K ($k = 1,\ldots,K$) country-specific variables that we argue may also help determine inter-temporal and cross-sectional differences in financial structure; β_j and γ_k are the respective regression coefficients; and $\varepsilon_{i,t}$ are the regression errors.

In principle, we could allow for firm-variation in the parameters, following Pesaran et al., (1999). This would involve replacing β_j by $\beta_{i,j}$ and γ_k

by $\gamma_{i,k}$, with i ($=$ $i,\ldots,I$) corresponding to each firm. There are several issues involved in this, one of which clearly is that estimating some 1000 or more separate parameters is not a compact and comprehensible way of presenting an analysis. Since our main purpose is to undertake a search for common features among Thai and Malay companies, to assume from the start that all companies are different would be to vitiate this purpose. Morever, we do examine systematic company differences in several ways, including tests for pooling, fixed effects, and by the use of industry and group variables.

Company financial structure ($y^*_{i,t}$) is not an unambiguous concept. The debt–equity or leverage ratio is the simplest summary statistic of the financial structure of a firm and is the one that is most commonly used in empirical work. However, leverage is not the only measure of financial structure, and leverage itself can be measured in several ways. Therefore, following Rajan and Zingales (1995) and Cornelli et al. (1996), we experimented with different definitions of leverage. We consider the main elements of financial structure as follows:

$$\sum_{h=1}^{4} y_{h,i,t} = a_{i,t} = \text{the book value of the firm's assets} \tag{2}$$

where $y_{1,i,t} =$ the book value of long-term debt; $y_{2,i,t} =$ the book value of short-term debt; $y_{3,i,t} =$ the book value of equity, with a variation that $y^m{}_{3,i,t} =$ the market value of equity; and $y_{4,i,t} =$ retentions.

The definitions of leverage that we employ are as follows: $(y_{1,i,t} + y_{2,i,t})/y_{3,i,t} =$ the ratio of total debt to book equity; $(y_{1,i,t} + y_{2,i,t})/y^m{}_{3,i,t} =$ the ratio of total debt to market equity; $(y_{1,i,t} + y_{2,i,t})/a_{i,t} =$ the ratio of total debt to book assets.

The explanatory variables in the regression ($X_{j,t}$) include tangibility, growth, profitability, and size. Tangibility is measured as the ratio of fixed assets to total assets (all at book value). Tangible assets are generally reckoned to be more collateralisable than intangibles. Therefore, the greater the level of tangible assets the firm has the greater the level of assets that can be used as collateral. This implies a positive influence on leverage. However, it can also be argued that monitoring costs of shareholders will be proportionately higher for firms that have higher levels of assets that can be used as collateral. This increases the likelihood of managers consuming more than the optimal level of perquisites, thereby causing the agency costs of debt to rise, further leading to low leverage. This suggests a negative influence of tangibility on leverage. In sum, we conclude that the overall impact of this variable is indeterminate; it may be positive or negative.

Growth is measured as the ratio of the book value of assets less the book value of equity plus the market value of equity all divided by the book value

Table 4. A Summary of the A Priori Influence of the RFCSM Exogenous Variables.

Variable	Hypothesised Direction of Influence
Tangibility	$\pm$
Growth	$-$
Profitability	$\pm$
Size	$+$

of assets. A negative dependence between growth and leverage is hypothesised since faster growing firms have greater opportunity to engage in asset substitution and transfer wealth away from the bondholder and towards the shareholder. In turn, this increases the agency costs of debt and thus leads to the negative relationship between growth and leverage.

Profitability is defined as earnings before interest, tax and depreciation over the book value of assets. In general, the more profitable the firm, the greater the amount of debt it can service, ceteris paribus. On the other hand, due to transaction costs, firms will prefer to use retained earnings rather than debt; this gives rise to the possible negative relationship between profitability and the demand for leverage. We conclude, as with tangibility, that the influence of profitability on firm leverage is indeterminate.

Size is measured as the logarithm of sales. Size is expected to have a positive impact on leverage. It is generally accepted that there are economies of scale in bankruptcy costs: larger firms face lower unit costs of bankruptcy than do smaller firms (see Prasad et al., 2001). Therefore, the bondholders of larger firms are more likely to get repaid than are those of smaller firms. This reduces the agency costs associated with debt and suggests that larger firms have higher leverage.

The a priori signs of these variables are summarised in Table 4.

3.2. The Augmented Capital Structure Model

To better explain companies' capital structure behaviour, the RFCSM is extended in two ways. First, we decompose the balance sheet more systematically into four components: long-term debt, short-term debt, equity and retentions. We, therefore, estimate a four-equation model giving the supplies by the firm of the four major liabilities.

For the endogenous variables of the ACSM, broad classifications are used due to the lack of sufficient detail for a number of individual firm accounts. Total liabilities are first split according to their legal claims: that is, into debt

Table 5. Summary of Definitions of Endogenous Variables.

	Variable	Definition
Liabilities	Long-term debt (w_1)	Total of long-term liabilities[a]/(total of shareholder's funds[a] + total liabilities[a])
	Short-term debt (w_2)	Total of short-term liabilities/(total of shareholder's funds[a] + total liabilities[a])
Shareholders' funds	Equity (w_3)	(Ordinary share capital + preference share capital)/(total of shareholder's funds[a] + total liabilities[a])
	Retained earnings (w_4)	Retained earnings[a]/(total of shareholder's funds[a] + total liabilities[a])

Notes:
$w_1 + w_2 + w_3 + w_4 = 1$ for the balance sheet to balance.
Total of shareholder's funds + total liabilities $\equiv$ total assets. The latter is used to reduce heteroskedasticity, see Titman and Vessels (1998).
[a]Where appropriate inflation adjusted variables will be employed under EKM, FIFO, and LIFO.

and equity. Each of these categories is then sub-divided. Liabilities are divided according to maturity: that is, into short-term debt (maturity of less than one year) and long-term debt (maturity exceeding one year). Equity, on the other hand, is separated into that subscribed by the firm's shareholders or equity; the remainder is effectively a balancing term, classified as retained earnings.[3] Definitions of these endogenous variables are contained in Table 5.

Second, we add additional explanatory variables. These are risk, non-debt-tax-shields and industrial classification. Specifically, however, this study limits itself to those variables that have shown up consistently within previous empirical research as being correlated with the demand for liabilities.[4] In turn, this allows the results produced here for developing economy firms to be compared with those derived for developed economies. Below, we discuss the main explanatory variables in the ACSM, namely firm risk, non-debt-tax-shields, growth opportunities, size, profitability and industrial classification.

Firm risk invariably appears in all empirical studies on capital structure. A priori, there should be a negative dependence between leverage and business risk. If the argument by DeAngelo and Masulis (1980) is extended, an a priori positive relationship is expected between risk and the demand for equity as well as for retained earnings. That is, equity and retained earnings do not have any payments attached to them. Accordingly, risky firms will prefer to use these sources of funds rather than debt. Also, the option pricing model suggests that the higher the risk, the higher the value of equity. In turn, this makes this source of finance more attractive to firms. However, because risk cannot be observed, a number of proxies have been used to measure risk, according to the literature. Some researchers have focused on using the variability of firm income, which is measured by the first standard deviation of its earnings or operating income. This may not be optimal since the firm's income is influenced by a number of factors outside its control and operating environment, e.g. bankruptcy of a number of its customers. In addition, using an absolute value without referring it to some scale is, to a degree, meaningless; thus risk should be measured according to some benchmark. Given these objections, a better measure of firm risk would be its beta (β), since it is quantified in relation to other corporations contained within the market portfolio. However, Prasad et al., (2001), amongst others, assert that assumptions underlying Capital Asset Pricing Model (CAPM) are not valid when dealing with capital markets found within developing economies. Despite these reservations, following previous studies,[5] risk is defined as the standard deviation of the firm's earnings, which is differenced so as to remove trend effects. To reduce heteroskedasticity, the risk variable is scaled by the firm's total assets. The overall definition of risk is identical to that employed by Bradley et al. (1982). Since inflation adjustments are treated as exogenous items, this study employs the profit after distributions adjusted for inflation bias. Moreover, Bradley et al. (1982), Thies and Klock (1992, p. 40) and Kale, Noe and Ramirez (1991) indicate that the relationship between risk and leverage is not monotonous and that under certain conditions may indeed be positive. Accordingly, this relationship is modelled as

$$Z_1 = a_1 + \delta_1(RISK)^2 \tag{3}$$

where, $a_1 > 0$, and *RISK* represents the firm's risk and is defined as *RISK* = *[σ(Earnings after tax–Earnings after tax-1)]/Total Assets*.

The non-debt-tax-shield is also an important explanatory variable in a capital structure model. A negative relationship between non-debt-tax-shields and leverage supports DeAngelo and Masulis'(1980) postulate; a positive sign adds weight to the posit of Scott (1977) and Moore (1986) that firms with substantial non-debt-tax-shields have considerable collateral assets, which can be used to secure debt that is less risky than that which is unsecured. A priori, the impact of non-debt-tax-shields on the demand for equity and retained earnings is not known. That is, for a given portfolio of liabilities, if the demand for debt falls, equity and/or retained earnings must rise, ceteris paribus. The non-debt-tax-shield measure is scaled by the total assets of the firm, NDTS.[6] Ideally, such a measure should encapsulate R&D and advertising expenditure as well as investment tax credits. Due to the lack of data, the following is applied:

$$Z_2 = \delta_2 NDTS = depreciation_i / total\ \ of\ \ assets_i \tag{4}$$

Given that the vector of exogenous variables, X_j, is the same for each endogenous variable, OLS estimation was applied; Syriopoulos and Sinclair (1993, p. 1544) note that parameter estimates of each individual equation will be as efficient as those found for the system using SUR.

We employ the effect of growth with respect to earnings since it is the main motivation of firms under the traditional school.[7] It can be argued that without an opportunity to increase potential earnings, it would be pointless for the firm to acquire and apply additional capital assets. Rational economic agents will not accumulate assets without a need for them.[8] A sustainable growth measure is employed over the 'traditional' ones, such as capital expenditures scaled by total assets, the growth of total assets, research and development over sales, and by the market-to-book ratio, advocated by Titman and Wessels (1988, p. 4); Allen and Mizuno (1989, p. 573); Chiarella, Pham, Sim, and Tan (1992, p. 148); as well as by Rajan and Zingales (1995, p.1451). That is, if the firm's actual growth rate is above its sustainable level, the excess must be financed by some means or other. In turn, this changes management's foreordained dividend and leverage policies. Apart from the research and development measure, the other traditional growth proxies will be contaminated by these sudden spurts of growth and have the affect of not representing its true underlying capital structure relationship, the central objective of this study. The former does not suffer from this since any increases in the firm's research and development signal underlying shifts in management policies towards growth rather than transient movements. That is, by its very nature, benefits of additional spending on research and development are not instant and are consequently shifts of management's attitude to growth. Unfortunately, such a measure cannot be employed due to the lack of data. A similar explanation holds for the sustainable growth measure. That is, from its construction, if the firm wants to increase the pace of its underlying, sustainable growth, it will have to alter either its ROE or the percentage of net income it retains and so alter management's financial structure polices. Thus, temporary anomalies are exorcised to a certain extent. This is the reason why this proxy is employed. However, if firm growth is faster than that which is sustainable, there will be a move away from the set of financial policies required for sustained growth and towards those needed for this higher level of growth. A number of authors, including Ellsworth (1983), Cleaver (1990) and Klein and Belt (1994), assert a positive relationship between growth and leverage. In sum, the direction of this relationship between growth and firm leverage is uncertain. Hence, in this paper, growth is measured in terms of Higgin's (1977) sustainable growth variable, as modelled in Klein and Belt (1994, p. 142):

$$Z_3 = \delta_3 GROWTH_i = (ROE_i \times RET_i) \div TA_i \tag{5}$$

where ROE_i is the return on equity, defined as (earnings per share)/(book equity per share), and RET_i is the percentage of net income retained by the firm and is defined as (retained earnings/total earnings) $\times$ 100%. Again, to reduce heteroskedasticity, the sustainable growth measure is scaled by the total of the firm's assets.

Profitability is also a key exogenous variable in the capital structure model. In terms of the impact of profitability on the demand for equity, the traditional theory will suggest that an a priori positive dependence will be exhibited. However, it can be argued that a profitable firm has no recompense for equity, which, for a given stream of dividends, will cause the proportion of retained earnings to increase, ceteris paribus. Consistent with previous studies, operating earnings scaled by total assets is used as a proxy:

$$Z_4 = \delta_4 PROF_i = Earnings\ after\ tax_i / Total\ Assets_i \tag{6}$$

In addition, size matters. Firm size is measured using the ratio of firm sales to total assets:[9]

$$Z_5 = \delta_5 SALES_i = SALES_i / Total\ Assets_i \tag{7}$$

Finally, to capture the influence of industrial classification, a set of dummy variables for the *j*th industry SIC code, IND*j*, is applied. Moreover, this prevents the need of applying an additional dummy to capture the uniqueness of firms:[10]

$$Z_6 = \delta_6\ IND_j \tag{8}$$

Hay and Louri (1996, p. 416) introduce a time trend to pick up any underlying shift in the firm's liabilities that arise from technical changes and improvements in financial management, which enable the firm to allocate its liabilities more effectively. Such a procedure is applicable if the number of data points per firm is large. Given the average small number of data points per firm, underlying shifts within the firm's portfolio of liabilities are assumed to be constant across the interval of study.

4. ESTIMATION AND TESTING RESULTS

4.1. The RFCSM

Diagnostic test results and initial OLS estimates of the RFCSM are presented in Table 6a,b,c. First, examination of the diagnostic tests shows that the null of normality is rejected for *all* demand equations. Second, in the main, the null of no first-order serial correlation is rejected by all of the Malay equations but is accepted by two-thirds of the Thai ones. Thus, the a priori expectation of past liability values affecting future ones, surprisingly, does not seem to hold for Thai firms. Third, a number of equations for both Malaysia and Thailand have rejected the null of no misspecification. This suggests that residuals: (i) contain information that is not captured by the explanatory variables and (ii) the linear specification of the debt demand equation is not appropriate.[11] An important characteristic of company account data sets is that there are several observations where leverage is zero. Here, the desired quantity of leverage was below its minimum price. Amemiya (1984, p. 5) notes that this is at odds to the linear assumption required and results in the least squares method being an inappropriate method of estimation. This results in misspecification. In these circumstances, Amemiya (1984, p. 5) recommends that the TOBIT[12] estimating procedure for fixed effects be employed. In turn, this procedure forces truncation at the origin and, therefore, ensures that fitted values are non-negative. Fourth, a number of equations for Malaysia rejected the null of homoskedasticity and were re-estimated with heteroskedastic-consistent standard errors; see White (1982). Equations that rejected the null of no misspecification were re-estimated using TOBIT. Here, estimation is carried out using maximum likelihood; see Amemiya (1984) as well as Greene (1990, p. 731). Thomas (1993, p. 99) notes that this estimation procedure will deliver heteroskedastic-consistent estimates.

4.2. Historic Prices

The estimation results for Malaysia and Thailand are reported in Table 7. These may be compared with the results by Rajan and Zingales (1995, p. 1453) and by Cornelli et al. (1996, p. 28 and 30), respectively. First, Malay and Thai firms report a negative statistical relationship between leverage and firm profitability. Thus, there is evidence to support the 'pecking order' hypothesis. This holds regardless of the definition of debt employed. This study sides with Cornelli et al. and opposes Hamid and Singh's (1992),

Table 6a. Initial OLS and Diagnostic Test Results for the RFCSM.

Inflation Adjustment	Historic Prices		EKM		FIFO		LIFO	
	Country							
Variable	Malaysia	Thailand	Malaysia	Thailand	Malaysia	Thailand	Malaysia	Thailand
Panel A: Leverage Scaled by the Book Value of Equity								
Tangibility	0.499409***	1.50037**	0.328647**	1.8835*	0.414833***	1.88253***	0.415738***	1.75986**
	(0.142842)	(0.992018)	(0.15153)	(1.1063)	(0.159611)	(1.10403)	(0.137602)	(1.06899)
Size	0.040236*	1.0518***	0.343337***	1.01943***	0.3245***	1.01934***	0.335605***	1.00238***
	(0.023604)	(0.228064)	(0.03842)	(0.223034)	(0.038482)	(0.223058)	(0.038312)	(0.222198)
Profitability	2.86152***	−1.07531**	−0.665958***	−0.642537*	0.00498662	−0.605474 *	−0.267474***	−0.6084 *
	(0.304669)	(0.614696)	(0.156293)	(0.483324)	(0.00505037)	(0.469192)	(0.1018)	(0.46885)
Market-to-book	0.034709***	−0.00106634***	0.012157	−0.00107321***	−0.01073	-0.106859×10^{-3}***	−0.010468	−0.00116663***
	(0.00672044)	(0.000303873)	(0.010731)	(0.000298035)	(0.010652)	(0.296816×10^{-4})	(0.010605)	(0.000311102)
Diagnostics								
Mis.[a]	5.84861***	1.649236	2.958335**	1.27083	1.59638	1.24808	1.2065	0.41023
	~F(3,976)	~F(3,677)	~F(3,1137)	~F(3,677)	~F(3,1137)	~F(3,677)	~F(3,1137)	~F(3,677)
Het.[b]	3.648347***	0.55045	2.5165*	0.42415	1.2249	2.34481*	4.21845**	1.5873
	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)
$Q(1)$[c]	94.76933***	20.013***	141.3232***	19.8689***	151.85602***	19.8866***	142.08082***	20.1623***
Norm.[d]	473439.4***	46891.12***	6731.526***	14103.82***	6027.848***	14102.16***	6407.78***	13577.23***
R^2 [e]	25.65%	70.88%	50.96%	62.86%	50.0%	70.86%	50.58%	70.91%
N[f]	1,145	685	1,145	685	1,145	685	1,145	685
Haus.[g]	28.07295***	6.25841†	21.18169***	6.82181†	83.559352***	6.837602†	24.60497***	6.99354†
Panel B: Leverage Scaled by the Market Value of Equity								
Tangibility	0.499409***	0.00364325***	0.187559**	0.0049947***	0.320623***	0.00493389***	0.378294***	0.00499426***
	(0.142842)	(0.00102135)	(0.094353)	(0.00115251)	(0.099367)	(0.00115054)	(0.085924)	(0.0011301)
Size	0.040236*	0.00046064**	0.00622728	0.00046969**	−0.0051685	0.000467558**	0.00419647	-0.438461×10^{-4}**
	(0.023604)	(0.000234808)	(0.023923)	(0.00023235)	(0.023957)	(0.000232456)	(0.023924)	(0.231346×10^{-4})
Profitability	−2.86152***	−0.00137669***	−0.541581***	-0.817534×10^{-4} *	−0.0336887	-0.778637×10^{-4}*	−0.117878*	-0.771792×10^{-4} **
	(0.304669)	(0.000632874)	(0.097318)	(0.0503512×10^{-4})	(0.00314416)	(0.488959×10^{-4})	(0.063568)	(0.488153×10^{-4})
Market-to-book	0.034709***	-0.1438×10^{-7}***	−0.014169**	-0.139365×10^{-7}**	−0.0012576*	-0.139073×10^{-7}**	−0.012336*	-0.145447×10^{-7}**
	(0.00672044)	(0.312859×10^{-8})	(0.00668189)	(0.310483×10^{-8})	(0.00663177)	(0.309321×10^{-8})	(0.00662241)	(0.323911×10^{-8})
Diagnostics								
Mis.[a]	5.84861***	7.53296***	15.59691***	7.144212***	3.2086**	7.02542***	19.58613***	7.1226***
	~F(3,1137)	~F(3,677)	~F(3,1137)	~F(3,677)	~F(3,1137)	~F(3,677)	~F(3,1137)	~F(3,677)
Het.[b]	3.64835**	2.51422*	8.90984***	2.38446*	4.282759**	9.07283***	7.28463***	2.565819*
	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)
$Q(1)$[c]	94.76933***	0.036792	128.58179***	0.00784435	151.6558***	0.0773003	149.15355***	0.0708456

Norm.[d]	473439.4***	228.7324**	501507.7***	236.4557***	503901***	237.7128***	509178.5***	236.9278***
R^2 [e]	43.08%	56.29%	38.66%	56.64%	37.47%	56.6%	37.83%	56.75%
N[f]	1,145	685	1,145	685	1,145	685	1,145	685
Haus.[g]	28.07295***	18.93154***	18.86773***	23.00158***	41.22742***	22.84117***	23.80946***	23.53166***
Panel C: Leverage Scaled by Total Assets								
Tangibility	0.106029***	0.134471***	0.145424	0.177519***	0.476013***	0.175765***	−0.0086861	0.202785
	(0.03275)	(0.041518)	(0.120715)	(0.048127)	(0.180445)	(0.048257)	(0.139512)	(0.047271)
Size	0.015624***	0.02977***	−0.055864*	0.030512***	−0.152795***	0.030498***	−0.136311***	0.033471***
	(0.00541185)	(0.0954499)	(0.030607)	(0.0970261)	(0.043505)	(0.09747975)	(0.038844)	(0.098255)
Profitability	−1.032***	−0.093716***	−1.05467***	−0.054174 ***	2.9278***	−0.050737 ***	1.24531***	−0.04814**
	(0.069852)	(0.025726)	(0.12451)	(0.21026)	(0.00570962)	(0.02508)	(0.103213)	(0.020732)
Market-to-book	−0.00272237**	-0.356341×10^{-5}***	0.0088534	-0.371778×10^{-5}***	0.019963*	-0.373088×10^{-5}**	0.016113	-0.353536×10^{-5}**
	(0.00154081)	(0.12717×10^{-5})	(0.00854883)	$(0.129653 \times 10^{-5})$	(0.012043)	$(0.129737 \times 10^{-5})$	(0.010753)	$(0.137569 \times 10^{-5})$
Diagnostics								
Mis.[a]	0.793553	9.052719***	80.2267***	7.02113***	527.9472***	6.83631***	498.2163***	6.42499**
	~F(3,1137)	~F(3,677)	~F(3,1137)	~F(3,677)	~F(3,1138)	~F(3,677)	~F(3,1137)	~F(3,677)
Het.[b]	0.4331	3.02145***	1.369862	0.416559	8.33922***	2.2812*	223.8113***	2.1444*
	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)	~F(3,1141)	~F(3,681)
$Q(1)$[c]	159.77682***	2.36125	4.08664**	2.60311	2.40756	2.5829	0.22523	1.95894
Norm.[d]	647.8385***	292.2805***	2035019***	496.1496***	1821997***	531.552***	1487313***	461.5989***
R^2 [e]	63.47%	68.85%	26.22%	68.17%	99.7%	58.63%	25.14%	67.75%
N[f]	1,145	685	1,145	685	1,145	685	1,145	685
Haus.[g]	20.91454***	12.12695***	23.51157***	13.50738***	23.05547***	13.62343***	34.06953***	14.48542***

Notes:

$F(3,976)$ critical values are 2.07698, 2.6008, and 3.8096 for the 10%, 5%, and 1% significance levels, respectively; $F(3,525)$ critical values are 2.08186, 2.60869, and 3.8268 for the 10%, 5%, and 1% significance levels, respectively; $F(3,979)$ critical values are 2.07696, 2.60078, and 3.80952 for the 10%, 5%, and 1% significance levels, respectively; and $F(3,528)$ critical values are 2.0818, 2.6086, and 3.8266 for the 10%, 5%, and 1% significance levels, respectively.

Standard errors are contained within parentheses.

†Significant at the 20% level.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

[a]Ramsey RESET test for misspecification using the squared, cubed, and fourth power of residuals.

[b]Ramsey RESET test for heteroskedasticity using the squared, cubed, and fourth power of residuals.

[c]Ljung–Box *first* order autocorrelation test.

[d]Wald test for normality, see Greene (1990).

[e]Adjusted value.

[f]Number of observations.

[g]Hausman test, see Svestre and Trognon.

Table 6b. Initial OLS and Diagnostic Results for the ACSM for Malaysia.

Inflation Adjustment	Historic Prices				EKM			
Equation	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	w_1	w_2	w_3	w_4	w_1	w_2	w_3	w_4
PRO	−0.235048†	−0.382737†	0.255727†	0.362057†	−0.052464	−0.194842†	0.067948	0.179359†
	(0.054858)	(0.073704)	(0.072761)	(0.073641)	(0.038305)	(0.053732)	(0.050477)	(0.058966)
Size	−0.54019E-2	0.040161†	0.925398E-3	−0.035684†	−0.832135E-3	0.021198†	−0.278547E-2	−0.01758†
	(0.575147E-2)	(0.772716E-2)	(0.762835E-2)	(0.772059E-2)	(0.429821E-2)	(0.60293E-2)	(0.566403E-2)	(0.661664E-2)
Growth	1.01141	−0.717941	−4.24528†	3.95181†	0.648303‡	0.380115	−0.367562	−0.660856
	(1.07698)	(1.44695)	(1.42845)	(1.44572)	(0.317171)	(0.444912)	(0.417957)	(0.488252)
Risk	−0.939663E-3†	0.21489E-2†	−0.149922E-3	−0.105932E-2‡	−0.879257E-3†	0.149078E-2†	−0.485368E-4	−0.562965E-3
	(0.362282E-3)	(0.486738E-3)	(0.480515E-3)	(0.486325E-3)	(0.318567E-3)	(0.44687E-3)	(0.419797E-3)	(0.490401E-3)
NDTS	0.476187	−0.619213	0.096215	0.046811	0.394227‡	0.070275	0.39466††	−0.859163†
	(0.250447)	(0.336484)	(0.332181)	(0.336198)	(0.16253)	(0.227988)	(0.214176)	(0.250197)
INDUS[a]	7.730654†	8.732784†	11.41855†	18.78202†	7.810492†	7.708016†	10.03435†	12.45629†
	∼F(131,853)	∼F(131,853)	∼F(131,853)	∼F(131,853)	∼F(129,828)	∼F(129,828)	∼F(129,828)	∼F(129,828)
R^2 [b]	0.579117	0.748944	0.658948	0.794563	0.552647	0.715577	0.624284	0.724881
Haus.[c]	10.065††	68.281†	18.133†	14.602‡	18.932†	61.749†	19.409†	19.522†
Q_1[d]	90.3408†	42.4571†	131.878†	117.895†	94.6619†	36.1676†	48.1039†	16.1507†
Norm.[e]	1274.278†	340.949†	181.9906†	8.641927†	132.123†	112.1968†	289.2347†	56.46695†
Hetero.[f]	10.24426†	4.09969†	4.13528†	6.60058†	2.83564*	2.07754***	5.00471†	3.46024*
	∼F(3,1013)	∼F(3,1013)	∼F(3,1013)	∼F(3,1013)	∼F(3,986)	∼F(3,986)	∼F(3,986)	∼F(3,986)
Missp[g]	4.62487†	3.0028*	1.73542***	3.83134†	1.19869***	0.73641***	3.56528*	2.09724**
	∼F(3,848)	∼F(3,848)	∼F(3,1013)	∼F(3,848)	∼F(3,823)	∼F(3,823)	∼F(3,823)	∼F(3,823)

Note:
PRO, profitability; NDTS, non-debt-tax-shields.
Standard errors are within parentheses.
†Significant at the 1% level.
‡Significant at the 5% level.
††Significant at the 10% level.
‡‡Significant at the 20% level.
*Significant at the 1% level.
**Significant at the 5% level.
***Significant at the 10% level.
[a] *F*-Test statistic calculated using the method employed by Balestra (1996).
[b] Adjusted value.
[c] Hausman test.
[d] Ljung–Box *first* order autocorrelation test.
[e] Wald test for normality (Greene).
[f] Ramsey RESET test for heteroskedasticity using the squared, cubed, and fourth power of residuals.
[g] Ramsey RESET test for misspecification using the squared, cubed, and fourth power of residuals.

FIFO				LIFO			
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
w_1	w_2	w_3	w_4	w_1	w_2	w_3	w_4
−0.16224†	−0.079769	0.105307‡	0.122611‡	−0.044654	−0.188244†	0.044445	0.1884453†
(0.034911)	(0.054574)	(0.049211)	(0.058823)	(0.037408)	(0.052429)	(0.049408)	(0.058001)
−0.01447†	0.043192†	0.602238E-2	−0.036719†	0.183217E-3	0.018556†	−0.61369E-2	−0.012602‡
(0.459745E-2)	(0.727378E-2)	(0.655899E-2)	(0.784011E-2)	(0.399184E-2)	(0.59947E-2)	(0.527235E-2)	(0.618931E-2)
0.35086††	0.650342‡	−0.833183†	−0.103341	0.643448‡	0.522172	−0.436456	−0.729164
(0.211417)	(0.328352)	(0.296085)	(0.353917)	(0.319759)	(0.448153)	(0.422332)	(0.495784)
−0.269524E-3†	0.433896E-3†	0.209415E-3†	−0.403611E-3†	−0.985925E-3†	0.153886E-2†	0.184856E-3	−0.737797E-3
(0.452076E-4)	(0.707999E-4)	(0.638425E-4)	(0.763123E-4)	(0.314747E-3)	(0.441127E-3)	(0.415711E-3)	(0.488011E-3)
0.302237‡	0.464871	0.270374	−1.00455†	0.399028‡	0.127674	0.339292	−0.865994†
(0.153737)	(0.246632)	(0.222396)	(0.265835)	(0.163468)	(0.229105)	(0.215905)	(0.253455)
7.401226†	5.999682†	9.645892†	11.27252†	7.83847†	7.74252†	9.830788†	12.10767†
	$\sim F(130,825)$	$\sim F(130,825)$	$\sim F(130,825)$	$\sim F(130,825)$	$\sim F(130,824)$	$\sim F(130,824)$	$\sim F(130,824)$
0.449883	0.686415	0.618328	0.708481	0.551667	0.714781	0.622472	0.722142
7.0663‡‡	62.827†	22.832†	29.727†	14.696‡	43.527†	17.658†	25.243†
173.4406†	28.786†	46.1071†	11.3957†	96.6205†	35.909†	44.9603†	15.5587†
3480.573†	228.3388†	182.3704†	58.68435†	3231.29†	104.5764†	363.9277†	26.72667†
129.0756†	2.50458**	5.34315†	7.54418†	0.8378*	2.13867**	3.34976*	3.238*
$\sim F(3,985)$	$\sim F(3,985)$	$\sim F(3,985)$	$\sim F(3,985)$	$\sim F(3,983)$	$\sim F(3,983)$	$\sim F(3,983)$	$\sim F(3,983)$
6.04358†	2.22301**	2.18873**	4.33737†	0.29594*	0.66205*	4.36392†	1.98294***
$\sim F(3,979)$	$\sim F(3,821)$	$\sim F(3,821)$	$\sim F(3,821)$	$\sim F(3,819)$	$\sim F(3,819)$	$\sim F(3,819)$	$\sim F(3,819)$

Table 6c. Initial OLS and Diagnostic Results for the ACSM for Thailand.

Inflation Adjustment	Historic Prices				EKM			
Equation	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]
	W_1	w_2	W_3	w_4	W_1	w_2	W_3	w_4
PRO	−0.142838†	−0.181402†	0.155714†	0.212224†	−0.591937E-2	−0.44091E-2	0.048041†	−0.037712
	(0.0471)	(0.061107)	(0.035438)	(0.052683)	(0.026388)	(0.035724)	(0.020349)	(0.032241)
Size	−0.337157E-3	0.176435^{E}-2	0.775783E-3	−0.418301E-2)‡	0.741096E-4	0.15418E-2	−0.451018E-3	−0.116489E-2
	(0.196011E-2)	(0.254302E-2)	(0.143993E-2)	(0.212375E-2)	(0.188023E-2)	(0.58787^{E}-2)	(0.144994E-2)	(0.229729E-2)
Growth	0.100867	−0.302469‡	0.049752	0.169948	−0.23005E-2‡	0.830152^{E}-3	−0.296132E-3	0.176648E-2
	(0.092679)	(0.1204)	(0.071446)	(0.107507)	(0.969094E-3)	(0.131197E-2)	(0.747319E-3)	(0.118405E-2)
Risk	−0.786833E-4	0.173167E-3†	−0.1908503E-4	−0.882167E-4	−0.162997	−0.391262‡	0.791076†	−0.236817
	(0.500087E-4)	(0.648807E-4)	(0.385932E-4)	(0.58106E-4)	(0.129204)	(0.174918)	(0.099636)	(0.157863)
NDTS	−0.786833E-4	−0.061235‡	0.171715†	0.038138	−0.010088	−0.030516††	0.01687††	0.23734
	(0.019604)	(0.025434)	(0.01032)	(0.023399)	(0.12632)	(0.017101)	(0.974114E-2)	(0.015434)
INDUS[a]	5.936385†	8.962598†	14.46983†	10.52916†	5.964369†	8.516115†	15.86885†	10.46511†
	~F(126,509)	~F(126,509)	~F(126,509)	~F(126,509)	~F(125,509)	~F(125,509)	~F(125,509)	~F(125,509)
R^{2}[b]	0.61157	0.690045	0.719703	0.60873	0.614469	0.674533	0.807194	0.69788
Haus[c]	10.217††	9.196‡‡	6.4847	3.9437	9.3282††	14.648‡	9.2178‡‡	16.507†
Q_1[d]	6.53845†	1.64785	99.7873†	161.615†	4.09012‡	1.86132	0.000902	5.16762‡
Norm[e]	131.7914†	77.17585†	456.772†	338.0306†	159.937†	22.46464†	684.4977†	0.254096
Hetero[f]	0.15502***	8.91693†	247.444†	556.5906†	0.31006***	0.75201***	11.66018†	0.73076***
	~F(3,669)	~F(3,669)	~F(3,669)	~F(3,669)	~F(3,668)	~F(3,668)	~F(3,668)	~F(3,668)
Missp[g]	0.18828***	3.68242*	22.77894†	35.06208†	1.28569***	0.24384***	9.85492†	0.40815***
	~F(3,504)	~F(3,504)	~F(3,663)	~F(3,663)	~F(3,504)	~F(3,504)	~F(3,504)	~F(3,504)

Note:
PRO, profitability; NDTS, non-debt-tax-shields.
Standard errors are within parentheses.
†Significant at the 1% level.
‡Significant at the 5% level.
††Significant at the 10% level.
‡‡Significant at the 20% level.
*Significant at the 1% level.
**Significant at the 5% level.
***Significant at the 10% level.
[a] *F*-Test statistic calculated using the method employed by Balestra (1996).
[b] Adjusted value.
[c] Hausman test.
[d] Ljung–Box *first* order autocorrelation test.
[e] Wald test for normality (Greene).
[f] Ramsey RESET test for heteroskedasticity using the squared, cubed, and fourth power of residuals.
[g] Ramsey RESET test for misspecification using the squared, cubed, and fourth power of residuals.

FIFO				LIFO			
[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]
w_1	w_2	w_3	w_4	w_1	w_2	w_3	w_4
0.500406E-2	−0.871646E-2	−0.023859	0.027572	0.471832E-2	−0.897153E-2	−0.023264	0.027518
(0.032981)	(0.049023)	(0.033289)	(0.047621)	(0.033093)	(0.049124)	(0.033334)	(0.04782)
−0.040575†	−0.174127E-2	0.017503†	0.024813†	−0.040596	−0.165385E-2	0.017552†	0.024698†
(0.647354E-2)	(0.9622332E-2)	(0.653404E-2)	(0.934705E-2)	(0.649271E-2)	(0.963799E-2)	(0.654013E-2)	(0.93822E-2)
−0.454214E-2†	0.685219E-2†	0.289118E-2††	−0.520123E-2‡	−0.376564E-2	0.636223E-2†	0.246292E-2††	−0.505951E-2‡
(0.154165E-2)	(0.229153E-2)	(0.155606E-2)	(0.222597E-2)	(0.139913E-2)	(0.207691E-2)	(0.140934E-2)	(0.202179E-2)
−0.039942†	0.067088†	0.027178§	−0.054324‡	−0.036451	0.069138†	0.025634††	−0.058322†
(0.014928)	(0.022189)	(0.015067)	(0.021554)	(0.015038)	(0.022323)	(0.015148)	(0.021731)
−0.907506E-2	−0.03822‡	0.030484‡	0.01681	−0.942188E-2	−0.038678††	0.030406‡	0.017694
(0.013093)	(0.019461)	(0.013215)	(0.018904)	(0.01343)	(0.019509)	(0.01239)	(0.018992)
3.947707†	4.460334†	5.645483†	11.26349†	3.922128†	4.470508†	5.64482†	4.664497†
	$\sim F(128,506)$	$\sim F(128,506)$	$\sim F(128,506)$	$\sim F(128,506)$	$\sim F(128,506)$	$\sim F(128,506)$	$\sim F(128,506)$
0.52797	0.518827	0.593329	0.490616	0.526108	0.519911	0.592873	0.490075
35.8†	13.211‡	14.204‡	13.649‡	34.995†	13.168‡	14.054‡	13.775‡
6.613‡	2.11406	13.5387†	8.61022†	6.5848‡	2.1077	13.227†	8.33376†
52.26693†	141.8557†	191.9614†	59.53114†	54.87594†	140.5612†	188.5226†	61.39414†
2.61917***	0.61773***	1.20909***	0.79515***	2.772248**	0.61383***	1.21224***	0.86845***
$\sim F(3,668)$	$\sim F(3,668)$	$\sim F(3,668)$	$\sim F(3,668)$	$\sim F(3,668)$	$\sim F(3,668)$	$\sim F(3,668)$	$\sim F(3,668)$
0.83675***	0.2153***	1.01297***	0.3032***	0.93772***	0.24798***	1.00469***	0.36954***
$\sim F(3,501)$	$\sim F(3,501)$	$\sim F(3,501)$	$\sim F(3,501)$	$\sim F(3,501)$	$\sim F(3,501)$	$\sim F(3,501)$	$\sim F(3,501)$

Table 7. A Summary of RFCSM Estimates for Fixed Effects and Panel Estimates Corrected for Misspecification and Heteroskedasticity.

Inflation Adjustment	Historic Prices		EKM	
Country Variable	Malaysia	Thailand	Malaysia	Thailand
Panel A: Debt/Book Value of Equity				
	T[a]	O[b]	T	T
Tangibility	0.514824***	1.50037***	0.387246***	2.232497***
	(0.145537)	(0.992018)	(0.157019)	(0.991412)
Market-to-book (growth)	0.037803***	−0.00106634***	−0.00736726	−0.000114965***
	(0.00723542)	(0.000303873)	(0.00736726)	(0.0000272153)
Size	0.067105***	1.0518***	0.417975***	1.04934***
	(0.024235)	(0.228064)	(0.40444)	(0.19837)
Profitability	−3.42097***	−1.07531**	−0.728002***	−0.613865*
	(0.781531)	(0.614696)	(0.156898)	(0.429222)
Number of observations	1,145	685	1145	685
Adjusted R^2	–	0.7088	–	–
Panel B: Debt/Market Value of Equity				
	T	T	T	T
Tangibility	0.514824***	0.000407337***	0.249823***	0.000554195***
	(0.145537)	(0.0000913569)	(0.097589)	(0.000103198)
Market-to-book (growth)	0.037803***	-0.507773×10^{-7} ***	−0.01339***	-0.151221×10^{-7} ***
	(0.00723542)	$(0.286222 \times 10^{-8})$	(0.00718812)	$(0.283799 \times 10^{-8})$
Size	0.067105***	0.0000491439***	0.037141*	0.0000504452***
	(0.024235)	(0.0000208538)	(0.024953)	(0.000020629)
Profitability	−3.42097***	−0.00013409***	−0.581923***	−0.0000777495***
	(0.317497)	(0.0000561443)	(0.097753)	(0.0000446254)
Number of observations	1,145	685	1,145	685
Adjusted R^2	–	–	–	–
Panel C: Debt/Total Assets; Leverage = Short-Term Debt+Long-Term Debt Reported by Company Accounts				
	O	T	T	T
Tangibility	0.106029***	0.147209***	−0.00951352***	0.194196***
	(0.03275)	(0.037159)	(0.103779)	(0.043109)
Market-to-book (growth)	−0.0272237*	-0.38358×10^{-5}***	0.019562***	-0.401622×10^{-5}***
	(0.0154081)	$(0.116201 \times 10^{-5})$	(0.00735022)	$(0.118473 \times 10^{-5})$
Size	0.015624***	0.030567***	−0.021269	0.031458***
	(0.0541185)	(0.00849493)	(0.025722)	(0.00863326)
Profitability	−1.032***	−0.092181***	−0.792248***	−0.052764***
	(0.069852)	(0.022891)	(0.106226)	(0.018697)
Number of observations	1,145	685	1,145	685
Adjusted R^2	0.6347	–	–	–

Standard errors in parentheses.
White (1982) heteroskedastic-consistent standard errors.
*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.
[a]TOBIT estimator used.
[b]OLS estimator used.

FIFO		LIFO	
Malaysia	Thailand	Malaysia	Thailand
Panel A: Debt/Book Value of Equity			
O	O	T	O
0.414833***	1.88253***	0.467627***	1.75986**
(0.159611)	(1.10403)	(0.140925)	(1.06899)
−0.01073***	−0.0001068***	−0.00543396	−0.00116663***
(0.010652)	(0.0000296816)	(0.011327)	(0.0000311102)
0.32345***	1.01943***	0.408608***	1.00238***
(0.038482)	(0.223034)	(0.040361)	(0.222198)
−0.00498662***	−0.605474*	−0.288091***	−0.6084*
(0.00505037)	(0.469192)	(0.1015)	(0.46885)
1,145	685	1,145	685
0.50	0.7086	–	0.7091
Panel B: Debt/Market Value of Equity			
T	T	T	T
0.386464***	0.00054779***	0.432152***	0.000552587***
(0.102372)	(0.000103027)	(0.087861)	(0.000009972)
−0.011387*	-0.150709×10^{-7} ***	−0.011427*	-0.157639×10^{-7}***
(0.00707488)	$(0.282667 \times 10^{-8})$	(0.00706809)	$(0.296667 \times 10^{-8})$
0.024124	0.0000502858***	0.033202*	0.0000470426**
(0.025017)	(0.0000203695)	(0.024985)	(0.0000432534)
−0.00300258	−0.0000740217***	−0.130024**	−0.000072947**
(0.00316997)	(0.0000433354)	(0.063415)	(0.000043253)
1,145	685	1,145	685
–	–	–	–
Panel C: Debt/Total Assets; Leverage = Short-Term Debt+Long-Term Debt Reported by Company Accounts			
T	T	T	T
−0.476013**	0.192408***	0.234473**	2.18667***
(0.249508)	(0.043225)	(0.128306)	(0.958407)
0.019963***	-0.402432×10^{-5}***	0.027703***	−0.000123887 ***
(0.026565)	$(0.1185173 \times 10^{-5})$	(0.00964562)	$(0.284716 \times 10^{-4})$
−0.152795**	0.031449***	−0.079141***	1.02923***
(0.072466)	(0.00867544)	(0.0128306)	(0.197597)
2.9278***	−0.049387***	1.3775***	−0.577921*
(0.0628917)	(0.018236)	(0.090661)	(0.416304)
1,145	685	1,145	685
–	–	–	–

Hussain's (1995), and Singh's (1995) controversial conclusion of LDC firms preferring to employ equity over debt and thus use a 'reversed' pecking order of finance. Thus, the tentative finding from ratio analysis of there being no evidence to support a 'reversed' pecking order of sources of finance is further substantiated. Indeed, for all three measures of leverage, the magnitude of the coefficient found for the profitability measure for Malaysia is greater than the corresponding one for Thailand. Thus, a 1% increase in the profitability of the Malay firm will lead to a greater fall in its leverage than a corresponding one for Thailand. In turn, this perhaps suggests that Malay firms adhere to the pecking-order hypothesis more strongly than their Thai counterparts.

Comparison of the magnitudes of the profitability variable found within previous studies indicates that apart from Japan, Malay and Thai firms adhere more strongly to the traditional pecking-order hypothesis than the firms found within the G-7 and CEE economies. However, this contradicts the preliminary findings derived under ratio analysis, which suggested that the adherence to the pecking-order hypothesis will be weaker for Malay and Thai firms than for those found within developed economies.

From the above, the traditional theory of a positive relationship between leverage and profitability does not seem to apply. Thus, for Malaysia and Thailand, given their small corporate bond markets, banks may lend funds to firms that are marginally profitable. Previous ratio analysis may have suggested, albeit tentatively, that equity values may not be closely priced according to their fundamentals. Thus, it could be argued that the 'liquidity brake' of increased income gearing depressing equity valuation perhaps does not seem to apply to prevent excess leverage of lower return firms found within these two developing economies. In turn, this perhaps may explain the negative relationship between leverage and profitability.

We noted from ratio analysis that this 'brake' was found to be perhaps less effective for Thailand, where gearing levels have increased for the 'representative' firm, than for Malaysia, where they have fallen over the period of study. Paradoxically, this could possibly suggest that the investment inflows to both the Thai and Malay capital markets may have led to increased economic instability. That is, firms with poor profitability may have no external check to prevent them over gearing themselves. In turn, together with Thai and Malay firms using lower levels of retained earnings as a source of finance, and the relatively small corporate bond market, contagion effects between the financial and real sectors could possibly be greater for Malaysia and Thailand than those found for developed economies, ceteris paribus.

Second, a statistically significant positive relationship between leverage and firm size is observed for both Malaysia and Thailand. Again, this observation is independent of the definition of leverage applied. Apart from Germany and France, this observation is also consistent with those observed for both the remaining G-7 economies as well as those of the former CEE states, respectively.

If size is taken as proxy for the inverse likelihood of default, then its positive relationship with debt may suggest: (i) that the costs of financial distress are low for both Malaysia and Thailand (Rajan & Zingales, 1995, p. 1456) in comparison to all the G-7 and CEE states apart from Germany and France; (ii) that agency costs of debt are inversely related to firm size; and (iii) that there may still be significant informational asymmetries between firm insiders and outsiders for the largest firms.

The positive relationship between size and gearing is perhaps not that surprising. Examination of the secondary two-digit British SIC codes for the firms contained within both the Malay and Thai country data sets shows that the bulk of the firms manufacture products across a number of industries. That is, they are diversified and are, therefore, less prone to collapse Titman and Wessels (1988, p. 6). In some ways, this supports assertion (ii). Assertion (iii) is substantiated by the ratio analysis findings of the previous paper against Singh's conclusion of LDC corporates using a significant greater level of equity than their developed country counterparts. That is, for Singh's (1995) conclusion to be observed, information asymmetries between firm insiders and outsiders must be lower for large firms. The cost of these firms issuing informationally sensitive liabilities, such as equity, should be lower and will result in reduced leverage, ceteris paribus. Clearly, this is not the case.[13]

In addition, the asymmetry of information between firm insiders and outsiders may suggest, very tentatively, that endogenous banks do not have the necessary experience/ability to monitor those firms whose risk 'quality' has not yet been determined. In turn, under these circumstances Stiglitz and Weiss (1981) suggest that firms may face credit rationing. That is, banks charge an interest rate that is too high since they cannot distinguish between firms. Under such a scenario, the high cost of external sources of finance will force firms to prefer to use internal sources over external sources. In part, this may explain the negative relationship between leverage and profitability.

For Malaysia and Thailand, the posit of credit rationing could perhaps be supported by the statistically significant positive relationship between leverage and tangibility. That is, the agency costs of debt are reduced since tangible assets are easy to collateralise. Consequently, the greater the proportion of total assets that are tangible, the lower the agency costs of debt, ceteris paribus. For banks to reduce their bad debts, the proportion of tangible assets held may be used as a signal of firm 'quality'. Grossman and Hart's (1982) argument of the inverse relationship between monitoring costs and the level of assets used as collateral also suggests a positive relationship with the supply of credit. Thus, despite the firm employing tangibility as a signal of firm quality, its use is not sufficient to bridge the gap of asymmetric information between the firm's management and bank and results in credit rationing being persistent. In turn, this negative effect on the demand for credit by firms is outweighed by the positive effect on the supply of credit. This causes profitable firms to employ internal over external sources of finance. However, our suggestion of firms facing credit rationing needs to be further investigated if it is to be robustly proved. This is beyond the scope of this study. Thus, this conclusion should be treated as being tentative at best.

In sum, the positive statistical relationship between tangibility and leverage is consistent to that found for the G-7 economies. This is contrary to that noted for Hungary and Poland by Cornelli et al. (1996, p. 12). The latter is thought to be a result of the downward bias created by fixed assets recorded at historic prices under inflation. This issue will be investigated later in this chapter.

Turning to the final attribute, growth, it is clear that capital structure behaviour of Thai firms is cognate to those of its G-7 counterparts: a statistically significant negative relationship between leverage and market-to-book ratio is observed. This is found to be independent of the leverage definition employed. The same cannot be said for Malaysia. Here, apart from leverage scaled by total assets, a statistically significant positive relationship is noted.

Prima facie, the negative relationship between growth and leverage for the G-7 group of countries perhaps adds support to Higgins' (1977) hypothesis that better managed firms rely less on outside financing. In addition, this result may also be consistent with the earlier ratio analysis preliminary finding of Thai firms being more efficient than their Malay counterparts. Indirectly, this negative relationship adds to the weight of evidence that supports a pecking-order hypothesis; see Copeland and Weston (1988, p. 507).

The positive relationship that we observe between growth and leverage, under book and market values of equity, for Malaysia needs explanation. Due to the negative relationship between leverage and profitability, the positive relationship between leverage and growth does not rule out Malay firms following the pecking-order hypothesis.

Another explanation is in relation to the costs associated with financial distress. That is, the higher the market-to-book ratio, the higher the costs of financial distress and the lower the gearing of the firm, ceteris paribus. This seems to be the case for Thailand and for the firms found within the G-7 economies. Thus, one possible reason for the positive relationship between leverage and the firm's market-to-book ratio could lie with the financial distress costs of bankruptcy for Malay firms being lower than those of its competitors. However, this is at odds to the behaviour observed under ratio analysis. Here, the representative Malay firm has reduced its gearing over the sample period whilst that for its Thai counterpart has increased. If the financial distress costs of Malay corporates were lower than those of its Thai competitors, Malay firms should have increased their gearing over the period rather than reduced it. Similarly, Thai firms should have reduced theirs. As with Rajan and Zingales (1995, p. 1456), the evidence is somewhat puzzling. However, the impact of risk, and thus the costs of financial distress, is investigated later within this empirical chapter. This should be able to shed some light on whether the financial costs argument can be applied.

4.3. The Impact of the Bias Caused by Inflation

Table 7 presents the reduced form equation estimates under Edwards-Kay-Mayer (EKM), FIFO and LIFO inflation adjustments for Malaysia and Thailand. First, examination of columns (5), (7) and (9) of Table 7 show that the signs of the attributes for Thailand remain as before. Thus, the conclusions derived under historic prices are *robust* under current prices for this country.

A different story unfolds for Malaysia. For Panels (A) and (B) only, leverage scaled by the book and market value of equity, respectively, profitability is still found to be negatively related to leverage; the adherence to the pecking-order hypothesis by firms is maintained under current prices. In turn, the contagion effects between the financial and real sectors remains persistent under inflation.

From its definition, it is clear that under rising asset prices, the three inflation adjustments would reduce the sensitivity of profitability on firm leverage, ceteris paribus. For Thailand, for all three leverage definitions, see panels (A), (B) and (C) of Table (7), this is observed. Similarly, for panels (A) and (B), this is again noted for Malaysia but not under the leverage definition of panel (C) where an increase is noted. Here, the sign of the profitability attribute changes from negative to positive. This will be discussed in depth later. The following discussion will concentrate on the results presented in panels (A) and (B) of Table 7 for Malaysia.

The positive relationship between tangibility and size with gearing may suggest that credit rationing still persists under inflationary conditions. Again, by itself, this conclusion is tentative at best and must be investigated further if it is to be more comprehensively validated. Both the numerator and denominator of the tangibility measure, for a given increase in the price of the firm's assets, rise under inflation adjustments. Recall that if the total of fixed assets is less than the value of the firm's total assets, then from the definition of the tangibility variable, the three inflation adjustments should result in a net fall in this measure. This is clearly seen for Malaysia for the three definitions of leverage. The converse is found for Thailand, where the magnitude of the tangibility attribute increases. This suggests that the replacement value of the Thai firm's stocks have fallen, all other things being equal. In sum, it is clear that Malaysia's data under inflation adjustments adheres more strongly to a priori expectations while Thailand's does not for the tangibility measure.

By its definition, the inflation adjustments are not expected to have an a priori impact on the size measure. Examination of Table (7) shows that the magnitude of this attribute remains the same as before for both countries.

On a positive note, and converse to that found under historic prices, a statistically negative relationship between growth and the firm's leverage is observed under all three current prices. This may add weight not only to Higgins' posit that better managed firms rely less heavily on outside financing, but perhaps shows that firms further adhere to the pecking-order hypothesis (Copeland & Weston, 1988, p. 507). More importantly, under current prices, it was tentatively suggested by earlier ratio analysis that firms may issue more equity when their shares are over-priced by the market. In turn, this may result in the observed negative relationship between leverage and the firm's market-to-book ratio.

Moreover, by revaluating assets and liabilities under current prices, the financial costs of distress increase as the value of the firm's assets rise. The negative relationship between leverage and the market-to-book ratio suggests that the management of Malay firms acknowledge this. This result adheres to that observed under ratio analysis when the representative Malay's firm's gearing has fallen under inflationary conditions. However, and under inflationary conditions, as the value of the firm's assets rise, the agency costs of debt fall, ceteris paribus. This should increase the supply of credit to the firm. Since an overall negative relationship is found between leverage and the market-to-book ratio, we suggest that the costs associated with financial distress outweigh the benefits of increased supply and lower real costs of using credit.

Recall that this growth measure is defined as the book value of assets less the book value of equity plus the market value of equity all over the book value of assets. Under the inflation adjustments, the book and market value of equity remain the same. Since the numerator and denominator both contain the book value of assets, a priori, the three inflation adjustments should not influence this measure. Ignoring the direction of the growth coefficients for Malaysia (Thailand), it is clear that the impact of the inflation adjustments have reduced (increased) the sensitivity of this measure on firm leverage, and this is regardless of the definition of leverage employed.

If attention now turns to leverage scaled by total assets, panel (c), first, and converse to that experienced under historic prices and independent of the inflation adjustment applied, a positive relationship is observed between this definition of leverage and the growth measure. From Copeland and Weston (1988, p. 507), this supports evidence against the pecking-order hypothesis and may also suggest that Malay firms may not be optimally managed since it is argued that the more efficient a firm is, the less likely it is to use external funds. That is, if efficient, the firm should be able to organise itself so as to provide any funds that are required from internal rather than external sources. The latter assertion is consistent with the preliminary findings obtained under ratio analysis. The posit of the firm being more concerned with the costs of financial distress over the benefits of lowered real costs of credit may have reversed.

From panel (C), in the main, firm profitability now has a positive and significant influence on the firm's level of gearing. Similarly, the impact of tangibility is overall negative in direction and is again statistically different from zero. This is the opposite of that observed under historic prices. The former (a) goes against Malay corporates adhering to a pecking order of sources of finance; (b) perhaps shows, contrary to the paradox of high share prices in the presence of poor fundamentals drawn previously under ratio analysis, that the 'liquidity brake' of increased income gearing depressing equity prices may be working; (c) that the 'traditional' or static school of the supply of funds is adhered to; and (d) that because of tax shield and bankruptcy cost issues, the debt-to-total-assets ratio should be positively related with firm profitability, which is found to be consistent with that observed under ratio analysis.

Ordinarily, a positive relationship between profitability and tangibility with leverage may suggest that the problems associated with credit rationing could have diminished under current prices. That is, banks use profitability and the level of tangible assets as reliable signals of firm quality. This results in the interest rates charged being lower for higher quality firms. Thus, the supply of credit should be positively related to these two variables, with the more profitable and collateral rich firms borrowing more funds, ceteris paribus. This posit would normally be supported by a positive relationship between size and leverage. From panel (C), since a negative relationship is noted between these two variables, prima facie, this may suggest that the information asymmetry between firm insiders and outsiders has increased under current prices.

The assertion forwarded by Grossman and Hart (1982) of monitoring costs being inversely related to the levels of collateral assets, resulting in the increase of agency costs and the consumption of perquisites by management can be examined. If the tangibility variable is used to capture this information, under the inflation adjustments, the tangibility variable will fall and will result in the monitoring costs rising, ceteris paribus. This increases the agency costs of management consuming their perquisites. The positive dependence between leverage and tangibility is clearly at odds with this.

In sum, the conclusions drawn for Thailand under historic prices remain under current prices. It is clear that the ones under Malaysia change for the better: the anomalous positive relationship between the market-to-book ratio and leverage now becomes negative and is consistent to the findings of the ratio analysis. In addition, the signs of the other variables remain as before. More importantly, and taken together, this shows that Malay corporates exhibit behaviour identical to their Thai and developed economy counterparts. The only disparity relates to when the dependent variable is leverage-to-total assets (panel c): the direction of influence of all measures reverse.

From the evidence provided by the inflation adjustments utilised by this study, the negative relationship between leverage and tangibility found for Hungary and Poland by Cornelli et al. (1996) and attributed to bias caused by assets being recorded at historic prices under inflation, cannot be substantiated. Indeed, under current prices, a positive relationship between these two variables is still evident.

Where it has been possible to accurately predict influences of the three inflation adjustments, it has been found for both Malaysia and Thailand that their profitability attribute has adhered to a priori expectations. With the tangibility measure, Malaysia has adhered to expectations whilst Thailand has not. Overall, both countries' data under the three inflation adjustments have remained the same. The theoretical coherence of the data has not improved under the three inflation adjustments.

Though the application of a reduced form model represents a significant advance over ratio analysis, it still has a major problem associated with it. That is, the problem of this study and of the empirical literature in this area per se is that they attempt to explain the capital structure, and thus the financial behaviour of the firm, by examining only leverage. They fail to directly to take into account other sources of finance such as retained earnings and equity, as well as how the firm chooses between them. It is for this reason that the empirical investigation of Malay and Thai corporates does not rest here but expands to take into account how the firm allocates its liabilities amongst retained earnings, equity and debt (both short- and long-term).

4.4. The ACSM

Tables 8 and 9 report the parameter estimates for the ACSM under historic and inflation-adjusted asset and liabilities, respectively. The results produced using historic costs together with the bias caused by inflation will both be commented upon as well as those produced using the RFCSM.

In the main, the diagnostic test results are similar to those found under the RFCSM. That is, we find for the RFCSM that the null of normality is rejected for all 32 equations whilst the null of no first-order serial correlation is rejected by all 16 Malay equations but not for some equations for Thailand. Thus, again, the a priori expectation of liabilities reported in one period impacting on those in subsequent periods holds more strongly for Malaysia than for Thailand. A number of equations for both countries again reject the null of homoskedasticity. Here, White's heteroskedastic-consistent standard errors were applied. A number of equations were found to be misspecified. TOBIT estimation was applied to remedy this.

It appears that all the industry dummies do not have a statistical influence on the demand for long- and short-term debt, equity and for retained earnings. This last result is contrary to that found by Kester (1986), Titman and Wessels (1988), Allen and Mizuno (1993), Singh and Hamid (1992), Hussain (1995) and Singh (1995).

More importantly, examination of Table 8 shows that, for a number of independent variables, the two components of debt (long- and short-term debt) and the two of equity (equity and retained earnings) have opposite signs. This shows the importance of disaggregating these two types of liabilities. Recall that a similar conclusion was reached from the review of previous empirical research.

4.5. Historic prices

Table 8 reports estimates corrected for misspecification and heteroskedasticity for the ACSM for both Malaysia and Thailand. The impact of each of the five exogenous variables is now discussed individually.

Table 8. ACSM Estimates Corrected for Heteroskedasticity and Misspecification.

Equation	Historic Prices			
	[1][a]	[2]	[3]	[4][a]
Malaysia	Long-Term Debt	Short-Term Debt	Equity	Retained Earnings
PRO	−0.271102†	−0.382737†	0.255727†	0.362057†
	(0.055684)	(0.089269)	(0.086898)	(0.057436)
Size	−0.48887E-2	0.040161†	0.925398^E-3	−0.035684†
	(0.547451E-2)	(0.0011816)	(0.884686E-2)	(0.707007E-2)
Growth	3.82245**	−0.717941	−4.24528‡	3.95181†
	(2.31297)	(1.10282)	(1.63767)	(1.32391)
Risk	−0.125043E-2†	0.21489E-2†	−0.149922E-3	−0.1095932E-2‡
	(2.31297)	(0.364042E-3)	(0.620669E-3)	(0.445348E-3)
NDTS	0.4873*	−0.619213*	0.096215	0.046811
	(0.238133)	(0.364578)	(0.719716)	(0.307897)
Equation	[17]	[18]	[19][a]	[20][a]
Thailand	Long-Term Debt	Short-Term Debt	Equity[b]	Retained Earnings
PRO	−0.142838†	−0.181402†	0.134228†	0.203319†
	(0.0471)	(0.061107)	(0.0013475)	(0.049382)
Size	−0.337157E-3	0.176435E-2	−0.001305	−0.00266707
	(0.196011E-2)	(0.254302E-2)	(0.00013475)	(0.0020551)
Growth	0.100867	−0.302469‡	0.018354	0.18313
	(0.092679)	(0.1204)	(0.063713)	(0.097171)
Risk	−0.786833E-4	0.173167E-3†	−0.138973E-5	−0.930927E-4*
	(0.500087E-4)	(0.648807E-4)	(0.343791E-4)	(0.524324E-4)
NDTS	−0.786833E-4	−0.061235‡	0.044414†	0.040699‡
	(0.019604)	(0.025434)	(0.013477)	(0.020554)

Note: PRO, profitability; NDTS, non-debt-tax shields.
Standard errors in parentheses.
*Significant at the 10% level.
**Significant at the 20% level.
†Significant at the 1% level.
‡Significant at the 5% level.
[a]TOBIT estimator used.
[b]Equations [9], [19], and [20] were estimated in fixed form.

4.6. Profitability

The adherence of Malay firms to the pecking-order hypothesis is further substantiated by the significant negative parameters found on the

Table 9. ACSM Estimates Under Current Prices Corrected for Heteroskedasticity and Misspecification.

Inflation Adjustment	EKM				FIFO				LIFO			
Equation	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12][a]	[13]	[14]	[15][a]	[16]
Malaysia	Long-Term Debt	Short-Term Debt	Equity	Retained Earnings	Long-Term Debt	Short-Term Debt	Equity	Retained Earnings	Long-Term Debt	Short-Term Debt	Equity	Retained Earnings
PRO	−0.052464	−0.194842†	0.067948	0.179359†	−0.151114†	−0.079769	0.104499**	0.113504*	−0.044654	−0.188244†	0.04445	0.1884453†
	(0.038305)	(0.053732)	(0.04603)	(0.058966)	(0.035693)	(0.054574)	(0.052697)	(0.053896)	(0.037408)	(0.052429)	(0.4514)	(0.058001)
Size	−0.832135E-3	0.021198†	−0.278547E-2	−0.01758†	−0.0133375†	0.043192†	0.608277E-2	−0.036038†	0.183217E-3	0.018556†	−0.612369E-2	−0.012602‡
	(0.429821E-2)	(0.60293E-2)	(0.0570825E-2)	(0.661664E-2)	(0.00482984)	(0.727378E-2)	(0.8869475E-2)	(0.719095E-2)	(0.399184E-2)	(0.59947E-2)	(0.481688E-2)	(0.618931E-2)
Growth	0.648303‡	0.380115	−0.367562	−0.660856	0.384585	0.650342‡	−0.82813*	−0.046349	0.643448‡	0.522172	−0.436456	−0.729164
	(0.317171)	(0.444912)	(0.729733)	(0.488252)	(0.420644)	(0.328352)	(0.455093)	(0.324236)	(0.319759)	(0.448153)	(0.385847)	(0.495784)
Risk	−0.879257E-3†	0.149078E-2†	−0.485368E-4	−0.562965E-3	−0.000257†	0.433896E-3†	0.20994E-3†	−0.397689E-3†	−0.985925E-3†	0.153886E-2†	0.184856E-3	−0.737797E-3
	(0.318567E-3)	(0.44687E-3)	(0.580702E-3)	(0.490401E-3)	(0.5274E-4)	(0.707999E-4)	(0.778301E-4)	(0.700003E-4)	(0.314747E-3)	(0.441127E-3)	(0.379798E-3)	(0.488011E-3)
NDTS	0.394227‡	0.070275	0.39466	−0.859163†	0.23667	0.464871	0.275217	−0.949926†	0.399028‡	0.127674	0.339292*	−0.865994†
	(0.16253)	(0.227988)	(0.387447)	(0.250197)	(0.193822)	(0.246632)	(0.387706)	(0.24329)	(0.163468)	(0.229105)	(0.197253)	(0.253455)
Equation	[21]	[22]	[23][a]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]
Thailand	Long-Term Debt	Short-Term Debt	Equity	Retained Earnings	Long-Term Debt	Short-Term Debt	Equity	Retained Earnings	Long-Term Debt	Short-Term Debt	Equity	Retained Earnings
PRO	−0.591937E-2	−0.44091E-2	−0.562068E-2	−0.037712	0.500406E-2	−0.871646E-2	−0.023859	0.027572	0.471832E-2	−0.897153E-2	−0.023264	0.027518
	(0.026388)	(0.035724)	(0.027296)	(0.032241)	(0.032981)	(0.049023)	(0.033289)	(0.047621)	(0.033093)	(0.049124)	(0.033334)	(0.04782)
Size	0.741096E-4	0.15418E-2	−0.103345E-3	−0.116489E-2	−0.040575†	−0.174127E-2	0.017503†	0.024813†	−0.040596	−0.165385E-2	0.017552†	0.024698†
	(0.188023E-2)	(0.58787E-2)	(0.190367E-2)	(0.229729E-2)	(0.647354E-2)	(0.9622332E-2)	(0.653404E-2)	(0.934705E-2)	(0.649271E-2)	(0.963799E-2)	(0.654013E-2)	(0.93822E-2)
Growth	−0.23005E-2‡	0.830152E-3	−0.229838E-2‡	0.176648E-2	−0.454214E-2†	0.685219E-2†	0.289118E-2*	−0.520123E-2‡	−0.376564E-2	0.636223E-2†	0.246292E-2*	−0.505951E-2‡
	(0.969094E-3)	(0.131197E-2)	(0.978332E-3)	(0.118405E-2)	(0.154165E-2)	(0.229153E-2)	(0.155606E-2)	(0.222597E-2)	(0.139913E-2)	(0.207691E-2)	(0.140934E-2)	(0.202179E-2)
Risk	−0.162997	−0.391262‡	−0.176283	−0.236817	−0.039942†	0.067088†	0.027178§	−0.054324‡	−0.036451	0.069138†	0.025634§	−0.058322†
	(0.129204)	(0.174918)	(0.132183)	(0.157863)	(0.014928)	(0.022189)	(0.015067)	(0.021554)	(0.015038)	(0.022323)	(0.015148)	(0.021731)
NDTS	−0.010088	-0.030516*	−0.988834E-2	0.23734	−0.907506E-2	−0.03822‡	0.030484‡	0.01681	−0.942188E-2	−0.038678*	0.030406‡	0.017694
	(0.12632)	(0.017101)	(0.012759)	(0.015434)	(0.013093)	(0.019461)	(0.013215)	(0.018904)	(0.01343)	(0.019509)	(0.01239)	(0.018992)

Note: PRO, profitability; NDTS, non-debt-tax shields.
Standard errors in parentheses.
*Significant at the 10% level.
**Significant at the 20% level.
†Significant at the 1% level.
‡Significant at the 5% level.
[a]TOBIT estimator used.

profitability variable in the long- and short-term debt equations for both countries. Myer and Majluf's (1984) posit of firms preferring to finance using internal before external funds is supported. Accordingly, this study shows proof *against* the prima facie empirical evidence of developing economy corporates provided by Singh and Hamid (1992), Ang and Jung (1993), Hussain (1995) and Singh (1995), who find a 'reversed pecking order'. However, the result is consistent with the finding for Australian firms by Chiarella et al. (1992, p. 153).

The conclusions for both countries substantiate the earlier findings found using the RFCSM under similar conditions of (i) Malay and Thai firms adhering to the pecking-order hypothesis and (ii) there being no evidence to support a positive relationship between firm profitability and leverage.

In addition, the negative relationship between long-term debt and profitability for both countries provides additional evidence for Donaldson's (1961) transactions cost argument of firms preferring to raise capital from retained earnings rather than from debt and finally from issuing new equity. This seems to be reinforced by the positive dependence between profitability and retained earnings. That is, the more profitable the firm is, the more retained earnings that are employed. Moreover, the said relationship may tentatively also suggest that both Malay and Thai firms engage in a form of 'dividend smoothing'. If this behaviour is not observed, and the firm does not divorce its dividend payments from its profit levels, in good times when profit levels are high, the firm is expected to issue more dividends resulting in retained earnings falling, *ceteris paribus*. Clearly, the observed positive relationship between retained earnings and profitability is at odds with this.

Support of the conventional pecking-order hypothesis does not simultaneously rule out the traditional theories of capital dependence of the market being reluctant to offer funds to those firms that are unprofitable – hence a *positive* relationship between equity with profitability. This last observation is noted for both Malaysia and Thailand. In turn, this can also explain the 'reversed pecking order' conclusion reached by previous research. That is, in the presence of a significant level of profits, under a given level of dividend payments, the firm has three options: (1) employ retained earnings rather than debt, etc. – the pecking-order hypothesis; (2) since it is profitable, the market will offer it external funds, *ceteris paribus* – the reversed pecking-order hypothesis; or (3) a mixture of (1) and(2).

4.7. Size

Size is *not* found to have a statistical influence on the proportion of long- and short-term debt held within the Thai firm's portfolio of liabilities. This is converse to the significant positive dependence noted between leverage and this variable for this country when using the RFCSM. However, for Malaysia, a significant positive relationship is exhibited between this variable and short-term debt, whilst an insignificant influence is noted for long-term debt. This is, though to a limited degree, consistent with the result found for this country using the RFCSM.

The last observation for the ACSM may be consistent with the posit advanced by Warner (1977), Ang, Chua, and McConnell (1982) as well as by Bradbury and Lloyd (1994), amongst others, that the firm's bankruptcy costs are quadratically related to firm value and results in them being lower for larger firms than for smaller ones. Accordingly, larger firms will have lower bankruptcy costs per unit of debt than their smaller peers, ceteris paribus. Moreover, the last observation for Malaysia also provides further support for Titman and Wessel's (1988, p. 6) argument of larger firms tending to be more diversified than smaller ones – the former being less likely to collapse in relation to the latter.

If size is taken as a proxy for the asymmetry of information between the firm and the market, with smaller firms being more widely known than their larger counterparts ceteris paribus, for Malaysia, it is clear that larger firms have proportionately lower costs of using debt than their smaller counterparts. Also, there is sufficient evidence for Malaysia to support the opinion that liquidation values of smaller firms would be proportionately higher than that of their larger counterparts with bondholders being more likely to get partial payments. This indicates that agency costs associated with managers transferring wealth away from a lender of funds towards the shareholder will be lower for larger firms.

If the transactions costs argument is valid, larger firms will have lower costs of issuing equity. They will, therefore, employ a lower amount of retained earnings for a given size of their portfolio of liabilities, ceteris paribus. This suggests a positive (negative) relationship between equity (retained earnings) and firm size. The latter dependence is statistically substantiated whilst the former is not for Malaysia. Taken together with the respective negative and positive parameter estimates between long- and short-term debt with size, it is clear that the a priori influence of firm size on the allocation of liabilities within the firm's portfolio of liabilities is not adhered to for Malaysia.

4.8. Non-Debt-Tax-Shields

In relation to the influence of non-debt-tax-shields, this variable is found to have an *insignificant* influence on the demand for long-term debt for Thailand. A positive relationship between this attribute and long-term debt is only reported for Malaysia.[14] Thus, for Malaysia, the argument that the firm will exploit the tax deductibility (shield) of interest payments to reduce its overall tax liability is clearly not supported. This is against the posit of DeAngelo and Masulis (1980). What is observed is that as the level of other tax shields (depreciation) rise, the firm will employ a greater proportion of long-term debt. This behaviour can be explained by high non-debt-tax-shields of depreciation being associated with high levels of tangible assets that are used as collateral to secure debt against, ceteris paribus. In turn, this produces the observed positive relationship between debt and non-debt-tax-shields.

Despite this, a significant negative dependence between this attribute and short-term debt is found for both countries. Thus, firms use non-debt-tax-shields to reduce their short-term gearing – its influence is only short-term in nature and suggests that firms use debt as a measure to reduce their tax liabilities in the short-term. In turn, this may suggest that non-debt-tax-shields influence the firm's cash flows. That is, as the level of non-debt-tax-shields increase, the firm's short-term debt falls, which, for a given interest rate, will cause the firm's cash flow to increase, ceteris paribus. This may provide further support for the earlier preliminary finding derived under ratio analysis where depreciation was noted as being an important source for the firm's cash flow and debt repayments.

The last conclusion is further supported by the magnitude of the non-debt-tax-shields parameter for Malaysia being 10 times larger than the corresponding one for Thailand; a unit increase of depreciation will result in a 0.6% increase in the firm's cash flow for Malaysia but only a 0.06% increase for Thailand. Such a conclusion was first obtained under ratio analysis.

For Malaysia, non-debt-tax-shields do not statistically influence the proportion of equity and retained earnings held. This is opposite to that observed for Thailand, where a significant positive dependence is noted. This may suggest that as the level of depreciation written off against profits increases, the proportion of equity and retained earnings that are held increase. It could be possible to apply Scott's earlier argument here. That is, high levels of depreciation are associated with considerable levels of tangible assets. It is theorised that for the firm to finance these levels of tangible assets, equity or retained earnings would have to be used, *ceteris paribus*.

4.9. Firm Risk

The intuitive negative relationship between long-term debt and risk is observed for Malaysia but is found to be *insignificant* for Thailand. The former observation is consistent with the findings of Kale et al. (1991). The argument of an additional unit of debt increasing the likelihood of firm bankruptcy is statistically supported. That is, there is evidence to support the posit that firms having earnings variability will cause investors to inaccurately forecast future earnings based on publicly available information; the market will see the firm as a 'lemon' and drive up the cost of using debt.

Surprisingly, as with Thies and Klock (1992, p. 48), a positive dependence is observed between short-term debt and risk for both countries. Thies and Klock (1992, p. 48) suggest that this behaviour is consistent with firms being restricted in borrowing long-term, which is partially offset by borrowing short-term. By itself, such a conclusion is tentative at best and will need to be further investigated if it is to be substantiated for Malaysia and Thailand. We leave this as a Promising Research Idea (PRI) for further research.

If the DeAngelo and Masulis (1980) assertion is extended, a positive relationship must be observed between equity and retained earnings with risk. Under earnings volatility, if the firm does not employ debt, due to its use increasing the likelihood of firm bankruptcy, for a given portfolio liability size, it must use the alternate sources of equity and/or retained earnings instead. The former security is advantageous since the firm does not necessarily have to pay dividends to shareholders. The negative insignificant and significant influence of risk on the demand for equity and retained earnings, respectively, found for both Malaysia and Thailand clearly shows that there is *no* evidence to support the extension of DeAngelo and Masulis' (1980) posit.

4.10. Growth

Prima facie, it is difficult to say whether or not Malay firms are operating efficiently. If this were the case, from Higgins' posit that better managed firms rely less on external sources of finance, a negative relationship between long- and short-term debt and equity with the growth attribute should be observed. Since a positive statistical relationship is noted between growth and long-term debt, a negative dependence for equity and an insignificant one for short-term debt, there is no clear evidence to either support or reject Higgin's (1977) posit.

Despite a negative (positive) statistical dependence on short-term debt (retained earnings) being noted, an identical conclusion is also reached for Thailand. This is still true since growth is found to have an insignificant influence on the proportion of long-term debt and equity held.

It should be pointed out that the positive dependence observed between long-term debt and growth for Malaysia together with the statistically negative relationship found between short-term debt and growth for Thailand, do, to a degree, support cognate observations found for both countries when using the RFCSM under historic prices. More importantly, these positive relationships may suggest that firms use their fixed assets to secure debt against. That is, if the additions of plant, etc. are used to produce goods to furnish sales growth, the higher the growth rate, the greater the amount of fixed assets employed. Since a positive dependence is noted for Malaysia between growth and leverage, this may suggest that the firm secures its long-term debt against its assets. In turn, this reduces the firm's stockholder–debtholder agency costs of conflict as well as the information asymmetry between the firm and the market. Moreover, such a posit is supported by the positive dependence between non-debt-tax-shields and long-term debt for Malaysia.

4.11. Impact of the Bias Caused by Inflation

Table 9 reports estimates corrected for misspecification and heteroskedasticity for the ACSM for both Malaysia and Thailand under the three inflation adjustment procedures. To save space, the impact of each of the five exogenous variables is not discussed individually. Instead, general comparisons are made and we will relate the sign and significance of parameters under the three inflation adjustments to their corresponding historic price ones.

It is clear that the sign and significance of parameter estimates for the size and risk remain the same under both historic and inflation-adjusted prices for Malaysia. Thus, the conclusions reached under the historic cost prices can still be applied here for this country. The only exception for the latter is that there is now a positive relationship between risk and equity. In turn, this supports the extension of DeAngelo and Masulis' (1980) theory as well as the option pricing model of risky firms using equity as a source of finance; however, this is opposite to that noted under historic prices.

It should be noted that the positive statistical dependence between size and short-term debt for Malaysia is converse to that noted using the RFCSM when leverage is scaled by total assets – panel (C) of Table (7).

However, the positive significant impact of profitability on long-term debt under ACSM is identical to that observed for the RFCSM under identical asset and liability prices for this country. Thus, both models provide support for the earlier conclusion of there being information asymmetries between the firm and the market.

Perhaps the greatest influence of the inflation-adjusted prices on Malaysia has been the impact of profitability. The previous positive significant relationship between profitability and retained earnings is still maintained. Thus, and under current prices, there seems to be some continued support for Malay firms adhering to 'dividend smoothing' behaviour.

Overall, the level of firm profitability is found to have no statistical influence on the proportion of short- and long-term debt held for Malaysia. However, a negative dependence is also noted for short-term debt. Thus, it is clear that the earlier conclusion of the Malay firm adhering to the pecking-order hypothesis is still substantiated, though weakly.

Under current prices, the adherence of Thai firms to the pecking-order hypothesis has weakened. Here, profitability is found to have a negative impact on both long- and short-term debt. In the main, its influence on the former is now insignificant. Despite this, the general result is identical to that observed for this country when using the RFCSM under identical conditions, except that the influence of profitability was always significant for the RFCSM.

Profitability is found to influence the level of equity that is employed by the Thai firm under the EKM adjustment. There seems to be some, though weak, evidence to support the posit that the market will lend funds to profitable firms under current prices. This is opposite to the earlier finding under identical asset and liability price conditions for the RFCSM for this country.

As with Malaysia, the overall positive dependence between profitability and retained earnings may suggest that Thai firms still adhere to behaviour consistent with 'dividend smoothing' under current prices. This result is consistent with that observed for this country under historic prices.

The influence of non-debt-tax-shields for Malaysia is positive and significant on long-term debt. This further supports the posit of firms using their assets as collateral for long-term debt under current asset and liability prices. Also, it is interesting to note that the magnitude of the non-debt-tax-shields parameter has reduced under the current prices in comparison with its historic price one. It cannot be determined whether this observation adheres to a priori expectations since, from the definition of non-debt-tax-shields, the impact of the inflation adjustments is indeterminate.

In the main, the insignificant influence of non-debt-tax-shields on equity remains as before for Malaysia whilst its previous significant negative influence on short-term is now found to be insignificant but positive and is against a priori expectations. That is, under rising asset prices, the firm's depreciation charge is expected to increase as well. In turn, this provides the positive sign and perhaps provides further support for the early posit of Malay firms using depreciation as an important source for cash flow.

For Malaysia, non-debt-tax-shields are now found to have a negative statistical influence on retained earnings. This is against its earlier insignificant impact under historic prices. It could be argued that this agrees with a priori expectations. That is, if Scott and Moores' argument of the depreciation charge being a signal of the size of the firm's tangible assets is used, under increasing asset prices, the firm's depreciation charge must also increase. As already noted, if firms adhere to 'dividend smoothing', for a given level of profits, the increase in the depreciation charge under current prices will reduce the proportion of retained earnings, ceteris paribus.

In the main, for Thailand, and contrary to that noted under historic prices, non-debt-tax-shields are found to have a positive and statistical influence on the proportion of equity and retained earnings. Thus, there is statistical evidence to support the proposal of firms financing higher levels of tangible assets by issuing equity, or by using retained earnings under current asset and liability prices, *ceteris paribus*.

More importantly, and identical to that observed under historic prices, a negative statistical relationship between non-debt-tax-shields and long-term debt for Thai firms under current prices is found. In turn, this supports the earlier hypothesis of high non-debt-tax-shields, depreciation in this case, reducing the demand for debt on interest payments as a tax shield. Moreover, this behaviour is consistent with (i) that noted for Malaysia under both current and historic asset and liability prices and (ii) *a priori* expectations.

Furthermore, for Malaysia, but inconsistent with *a priori* expectations, the magnitude of the non-debt-tax-shields parameter for long-term debt rises under current prices for Thailand. In addition, non-debt-tax-shields under current prices do not statistically influence the level of short-term debt carried by the Thai firm. Unlike Malaysia, its direction is negative and thus provides no further support for the tentative posit derived under historic prices of firms using depreciation as a source of cash flow.

The continued positive significant dependence of growth on long-term debt under current prices is against Higgin's (1977) posit for Malaysia. However, it is again difficult to determine if firms are operating efficiently due to the insignificant dependence of short-term debt, equity and retained earnings on growth for this country. Moreover, this observation found using the ACSM is also consistent with that noted by the RFCSM for Malaysia under identical conditions, where a negative dependence between debt and growth is found, thus indicating that firms do not use debt, an external source of finance, and are therefore operating efficiently.

As with Malaysia, for Thailand under current prices, there is evidence to support Higgin's (1977) posit that efficiently run firms will have less need to use outside sources of finance. This is supported by the continued significant positive relationship between growth and short-term debt, by the now significant positive influence of growth on equity, as well as by the insignificant negative impact of growth on retained earnings, all under current prices. However, under EKM for this country, the direction of the parameter estimates for growth adheres to Higgin's (1977) posit. It should be pointed out that the negative dependence of long-term debt on growth for Thailand is consistent with the negative relationship using the RFCSM under identical current prices for this country. Moreover, the positive dependence of short-term debt on growth provides support for Myers' (1977) theory of firms using short-term debt to reduce stockholder–debtholder conflicts of interest. A similar conclusion was noted for Malaysia from Table 9.

The overall significant positive impact of the size attribute with equity may seem to suggest that the asymmetric costs of information between the firm and the market are lower for larger firms. In turn, this agrees with a priori expectations; however, the negative though insignificant influence of size on long-term debt is against this. Thus, no overall conclusion can be made as to whether information asymmetries have reduced under these three inflation adjustments.

Contrary to what was found for Malaysia, and apart from EKM, examination of Table 9 shows that there is a negative dependence of size on short-term debt. In turn, this suggests that small firms borrow more short-term debt than long-term debt. Titman and Wessels (1988) suggest that this could be due to the transaction costs of long-term debt being proportionately greater for smaller firms than for their larger counterparts. In turn, this may perhaps increase smaller firms' sensitivity to downturns within the economic cycle, unlike in the case of their larger peers who employ more long-term debt, *ceteris paribus*. However, the negative dependence between long-term debt and size suggests that small Thai firms use long-term debt as a source of finance. This is clearly at odds to what was suggested by Titman and Wessels (1988). That is, the negative relationship between long-term debt and size provides evidence that the costs of long-term debt are small for small firms.

However, smaller firms would be more sensitive to economic downturns due to their increased gearing.

Finally, in relation to the impact of firm risk on the allocation on the four types of liabilities for Thailand, the intuitive negative relationship between risk and long-term debt is now observed. Recall that this is converse to that noted under historic prices for this country.

As with historic costs, an overall significant positive relationship is found between short-term debt and risk for Thailand under current prices. This is independent of the inflation adjustment that has been applied. Thus, this could possibly support Thies and Klock's (1992, p. 48) posit of firms using short-term debt to circumvent restrictions on them borrowing long term under current prices for this country.

Like Malaysia, there seems to be some evidence to support the extension of DeAngelo and Masulis' (1980) theory of risk having a positive impact on the amount of equity and retained earnings held by Thai firms. This is shown by the significant positive influence of risk on equity under the FIFO and LIFO inflation adjustments, quite the reverse of that noted under EKM. However, the significant negative influence of risk on retained earnings found under historic prices now undermines, to a degree, this extension of DeAngelo and Masulis' (1980) theory.

For Malaysia, it is clear that the ability of the size attribute to adhere to a priori predications is identical to that found for this country under historic prices. This is due to the overall sign of appropriate coefficients being the same under historic and inflation-adjusted prices. Accordingly, the earlier conclusion of size not adhering to *a priori* expectations is not improved upon under inflation-adjusted prices. On the other hand, for Thailand, a slight improvement between size and its adherence to a priori expectations has occurred: a positive, though insignificant, dependence between equity and this variable now occurs.

A similar story is told for risk and non-debt-tax-shields for this country as well. The adherence of the data to theoretical predictions under inflation adjustments is the same as that noted under historic prices. This is due to the overall sign and significance of the parameters remaining the same as those under historic prices.

A significant improvement is noted for the adherence of the inflation-adjusted prices to theoretical predictions for Thailand with risk, since there is further evidence to support the extension of DeAngelo and Masulis' (1980) argument of a positive dependence between risk and equity.

As with risk and size, again a significant improvement of the inflation-adjusted data to theoretical predictions for Thailand is observed for non-debt-tax-shields. This is due to a negative statistical dependence now being noted under the inflation adjustments, whilst being insignificant under historic prices for long-term debt.

Turning to profitability, a number of previously significant parameters under historic prices for both countries have now become insignificant. However, the direction of parameter estimates have, in the main, remained the same. Thus, it is concluded that the adherence of the inflation-adjusted prices to *a priori* predictions remains as before, but the statistical adherence of any findings has been lost.

Finally, in relation to growth, for both countries an improvement has been observed. This has been due to the impact of this variable on short-term debt now being positive, though insignificant, and may add weight to Myer's posit of there being a reduction in the agency costs between debt- and stockholders.

More significantly, and which is again another important finding, we can conclude that the inflation adjustments employed have been important since they have increased the adherence of the data to theoretical predications. This has especially been more marked for Malaysia than for Thailand for the ACSM.

5. SUMMARY AND CONCLUDING REMARKS

In this paper, the RFCSM benchmark model and the extensions to ACSM were estimated and tested on Malay and Thai company data, each time accounting for adjustments to inflation. Our data show that a relatively high proportion of asset growth is internally financed in both Malaysia and Thailand, mainly through retentions. Inflation-adjusting the accounts increases the level of equity financing, suggesting that in times of inflation, equity finance is used indirectly to shore up companies' cash and liquidity.

The main findings for the RFCSM and ACSM are as follows. First, there is evidence to support the pecking-order hypothesis. There is also evidence against the controversial findings of previous studies relating to a 'reversed pecking-order' of finance. Second, information asymmetries still persist. Other studies have suggested that this might create credit rationing. Rather than being a macroeconomic problem, we suggest that this is perhaps more a microeconomic one: perhaps endogenous banks may not have the right know-how to distinguish between high- and low-risk companies. Again, such a conclusion, given the evidence we have presented, is tentative. Further empirical investigation is again needed for this to be substantiated.

However, there is sufficient empirical evidence that shows that the firms in both countries face reduced agency costs between debtholders and owner-managers. Moreover, risk is found to have a non-linear influence on leverage. This concurs with the findings of Bradley et al. (1982) and may support the assertion that the risks of bankruptcy are non-linear, as held by the traditional capital structure school of thought.

For the RFCSM, the above conclusions are robust when current prices of assets and liabilities are employed. That is, if all the inflation adjustment results are viewed jointly, there is no change for Thailand. For Malaysia, the positive results outweigh the negative ones; that is, the positive relationship between the market-to-book ratio and leverage found under historic prices reverses when assets and liability are restated in current prices. For the ACSM, it is clear that the inflation adjustments have, overall, improved the ability of the data to adhere to *a priori* predictions. This is especially the case for Thailand.

As expected, the ACSM not only captures information contained within the RFCSM but also further explains the firm's financing behaviour. We also found that the disaggregation of debt into its short- and long-term components was beneficial. Here, the short- and long-term debt effects were not always the same. A similar conclusion was noted when equity was split into its retained earnings and that subscribed by the firm's shareholders (equity). This is a major finding and shows that all the components that make up one particular type of liability do *not* necessarily behave the same way. Thus, disaggregation yields additional insights into corporate capital structure behaviour that the majority of previous empirical studies have not found.

The conclusions of the RFCSM and the ACSM were found to digress from each other under current asset and liability prices. In turn, this may suggest that inflation bias does have an important role in explaining how liabilities are simultaneously allocated. Clearly, the latter would not be normally captured using single liability models *per se* and represents the advantage of the ACSM over the RFCSM under these conditions.

Where suitable, both the RFCSM and ACSM produce conclusions that are first noted under ratio analysis. Though crude, ratio analysis should not be discarded. To a certain degree, it can be used to (a) gain insight into the rudimentary financing behaviour of firms and (b) provide preliminary hypotheses that can be tested using specific models.

The ACSM represents an advance over the RFCSM. More importantly, the ACSM fails to directly incorporate the price or cost of using a particular source of finance per se. For example, it could be argued that the costs of debt are indirectly incorporated into the exogenous variables of the RFCSM and ACSM. That is, if the underlying cost of using debt was very expensive, its responsiveness to changes in the level of the firm's non-debt-tax-shields, profitability, etc. would not be that great. From the firm's point of view, the actual cost of using debt has often been ignored by the majority of the empirical literature at the microeconomic level.

NOTES

1. See Green, Murinde and Suppakitjarak (2001) for a discussion of the issues underlying the interpretation of some of these statistics.
2. See Singh (1995) for further details.
3. Hay and Louri (1997, p. 415, 1991, p. 429, 1989, p. 148) apply a similar 'consolidated' approach to both liabilities and assets. Four, six and five categories (endogenous variables) of balance sheet assets and liabilities are used within these demand equation systems, respectively.
4. The reduced form capital structure model employed tangibility, profitability, size and growth as its exogenous variables. The growth measure involved the use of the market-value of the firm. To minimise duplication, tangibility is not included within the vector of exogenous variables within this augmented capital structure model.
5. See Bradley et al. (1982, p. 871), amongst others.
6. Here the majority of previous empirical work is followed; Vogt (1994), amongst others, adopts the total assets scalar. This controls for firm size and reduces heteroscedasticity problems that may be present in the data set. The proxy used may not reflect DeAngelo and Masulis' (1980) posit that as a result of these constraints, the availability of pre-tax cash flows may be lowered which in turn causes the present value of depreciation to increase relative to *pre*-tax cash flows and reduce the likelihood of using interest tax deductions of debt. Downs's (1992) scalar of discounted cash flows corrects for this. The use of this denominator is left as a PRI. Accordingly, there will be some bias in inferences that are drawn. Nevertheless, this bias should be on par with those found in other studies which have used depreciation deductions over total assets as a measure of non-debt-tax-shields, e.g. Titman and Wessels (1988). Normally, the modelling of non-debt-tax-shields (NDTS) would follow that of Allen and Mizuno (1993, p. 573) as well as Chiarella et al.(1992, p. 148) Chiarella, Pham, Sim and Tan (1992, p. 148).
7. On the other hand, Titman and Wessels (1988, p. 4) note that: "Growth opportunities are capital assets that add value to a firm but cannot be collateralised and do not generate current taxable income."
8. Burton, Lonie and Power (1993, p. 2) find no difference when using growth defined in terms of total assets or earnings. Titman and Wessels apply research and development expenditure scaled by sales. This would make a better proxy than earnings since a firm will only conduct research and development if it could be used in the future to generate future earnings. Due to the scarcity of data, such a proxy cannot be constructed. Note that earnings will be influenced by a number of non-growth factors such as foreign exchange income etc. Inferences should interpreted with this in mind.

9. In addition, Titman and Wessels (1988) apply a labour turnover variable to measure firm size. Due to the lack of data, this proxy cannot be replicated and compare results. Given that total assets is used as a scalar, it cannot be applied as a numerator for a variable per se.

10. Note should be given to the modelling of industrial dummies. A 'Hendry' approach is used. First of all, an *F*-test, Balestra (1996, p. 47), is applied to see if *all* the industry dummies have a significant influence. If the null is not rejected, individual industrial dummies are investigated; insignificant ones are dropped.

11. The empirical evidence of Bradley, Jarrell, and Kim (1984) points to a non-linear relationship between leverage and dependent variables.

12. A type I TOBIT model was applied since the impact of the allocation of liabilities within its portfolio on any other part of the firm's operation is not examined.

13. Due to the lack of information, verification of posit (i) is left as a PRI.

14. This observation is consistent with the results found by Bradley et al. (1984), Boquist and Moore (1984), Auerbach (1985), Allen and Mizuno (1989), Gardner and Trzcinka (1992) and Downs (1993) but against those reported by Bowen, Daly and Huber (1982), Kester (1986), Titman and Wessels (1988), Long and Malitz (1985), Givoly et al. (1989) and Pilotte (1990).

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MEASURING THE COST OF EQUITY IN FRONTIER FINANCIAL MARKETS

Daryl Collins

ABSTRACT

The objective of this study is to establish the most appropriate method for calculating the cost of equity for markets in different stages of development and global integration. The sample of 59 markets includes both developed and emerging markets as well as the smallest and least developed frontier markets. Markets are sorted into tiers based on three different methods of measuring market development and global integration. Eleven alternative risk measures are calculated and used in cross-sectional correlations and regressions. The results suggest that using the capital asset pricing model to determine the cost of equity is not appropriate for any market, either emerging or developed, and that downside risk measures may be a more appropriate method for calculating the cost of equity.

1. INTRODUCTION

A decade ago emerging markets were considered the investment destination of the future. With an increase in stock market capitalisations via privatisation listings, the advent of Brady bonds and the successful implementation

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of stabilisation plans, many emerging markets saw a dramatic increase in foreign investment. Over the past decade, these inflows of foreign capital to larger and more mature emerging markets have allowed them to become more integrated with global markets, while frontier[1] markets that did not receive foreign inflows are still somewhat segmented from global markets. These different patterns of integration and segmentation are likely to have significant consequences on the degree of certainty in determining the risk of an investment in an emerging market, particularly in frontier markets.

Firms evaluating a direct investment project in a new market must estimate not only future cash flows but also an appropriate discount rate or weighted average cost of capital. One of the most difficult elements to estimate in the cost of capital is the cost of equity. Practitioners commonly use the capital asset pricing model (CAPM), which estimates beta as a measure of risk, to calculate the cost of equity. However, many of the fundamental assumptions required for CAPM tend to be violated in most markets, both developed and emerging. CAPM assumes that pooling idiosyncratic risks is feasible, although this is only true in integrated markets. However, most markets are either only partially integrated or entirely segmented. Therefore, the CAPM and its risk measure of beta are consequentially seen to be inappropriate for most emerging financial markets and many developed markets.

Although opportunities in emerging and frontier markets may be attractive, investors will shy away from any investment where they cannot quantify the risk involved. Because of the lack of information and data, frontier markets are likely to be the most difficult in which to quantify risks. Yet they are typically in the poorest countries where foreign direct investment could have the most impact. Because most of these markets are segmented from global financial flows, estimates of the cost of equity based on the CAPM are incorrectly measuring the investment risk in those countries. This creates additional uncertainty and discourages investment. This study aims to identify the most accurate and feasible measure of risk in emerging and frontier markets and, in doing so, to verify an approach for calculating the cost of equity for those markets.

2. MEASURING THE COST OF EQUITY

2.1. Capital Asset Pricing Model

The cost of equity is a critical variable in the decision to invest in countries. It is the minimum required rate of return, given the level of risk, for investing capital in a country. In other words, it is the required return in exchange for placing capital at risk (Anderson & Groth, 1997).

The CAPM was developed in Sharpe (1964), Lintner (1965) and Mossin (1966) as a means of measuring a required rate of return, using beta as the measure of risk. It states that a firm's cost of equity consists of a risk-free rate of return plus a risk premium that reflects how volatile its returns have been relative to the world. The risk-free rate can be thought of as a compensation for any loss of purchasing power demanded for any risk-less asset, while the risk premium is the extra compensation required for bearing the risk of the investment.

The CAPM equation is

$$R_{\text{country } i} = R_{\text{f}} + \beta[R_{\text{world}} - R_{\text{f}}] \tag{1}$$

where $\mathrm{R}_{\text{country } i}$ is the return of the market in country *i*, R_{f} is the global risk-free rate, R_{world} is the return on the world market and β is the risk measure for country *i*. In the international version of this model, investors are presumed to hold a diversified world market portfolio consisting of equities from all national markets. The CAPM predicts that equities with higher variances (higher risk) will command higher expected returns.

2.2. Problems with the CAPM

A significant criticism of the CAPM is the necessary assumption that markets are fully integrated. Markets are said to be fully integrated when assets of identical risk around the world command the same expected return and are said to be totally segmented when they are isolated from world market activities. Basic theory allows a calculation of the cost of equity in an open, integrated economy as well as in a closed, segmented economy. However, emerging markets, and in fact many developed markets, are only partially integrated or have become integrated over time.[2]

Whether markets are integrated or segmented has an impact on the cost of equity. Harvey (1995) suggests that local information is more likely to affect a country's equity returns and volatility when the market is segmented and that world information affects countries that are integrated. In other words, the sources of risk in a segmented market are focused on the local economy (Bekaert, Erb, Harvey, & Viskanta, 1998). Further analysis performed by Bekaert, Harvey, and Lumsdaine (2002) shows markets that become more integrated should eventually see a decrease in the cost of equity and a reduction in the high premium demanded in segmented markets. Alexander, Eun, and Janakiramanan (1987) and Errunza and Losq

(1985) review international asset pricing models and show, as does Hargis (2000), how a shift from market segmentation towards integration reduces overall risk and lowers the required rate of return.

Asset pricing theory (APT) (Ross, 1976) is based on fewer and less restrictive assumptions than is the CAPM and might be a more appropriate model with which to calculate cost of equity. APT is a more general model that stipulates that more than one risk factor – not just beta as assumed in the CAPM – might have significant relationships to mean returns. The sensitivities of those factors that cannot be diversified away in a multi-asset portfolio will then be reflected in the asset price. Empirical works (such as Chen, Roll, & Ross, 1986) suggest that macroeconomic variables such as money supply, inflation and economic growth explain asset returns. These macroeconomic variables are only available in monthly or quarterly frequencies. However, because time series of frontier market returns are often only available for less than six years, it is necessary to use weekly data to increase the number of data points. Moreover, in frontier markets, many financial factors, such as term structure and dividend growth, are either not available due to the immature nature of financial markets or not calculated due to unsophisticated data collection methods. Therefore, although APT might be an appropriate alternative method for determining risk measures, it is not suitable for all markets across the broad sample used in this study.

3. MEASURING MARKET DEVELOPMENT AND INTEGRATION

The CAPM and beta, therefore, are unlikely to provide a correct and unbiased estimate of market risk in emerging markets. The aim of this study is to provide the most appropriate measure of risk for evaluating expected returns in all markets, including emerging and frontier markets. One of the contributions that this study aims to make is to test ways of categorising markets into different stages of development and integration. Several factors could be used to categorise each market into different tiers of development and integration. The key determinant of whether markets are appropriately categorised is the significance of each tier's relationship of different risk measures to returns.

The most widely used categorisation of emerging markets is based on International Finance/Standard & Poor's (IFC/S&P) emerging market database (EMDB). The EMDB classifies 34 markets as emerging markets, 32 of which are in this sample, as shown in Table 1a. Table 1b provides a relative development ranking calculated on the basis of market capitalisation,

Table 1a. Market Tiers, as Defined by the IFC/S&P EMDB.

First tier – Developed markets
United States
France
Germany
Sweden
United Kingdom
The Netherlands
Canada
Spain
Switzerland
Hong Kong
Australia
Denmark
Singapore
Austria
Japan
New Zealand
Second tier – Emerging markets
Portugal[a]
Mexico
South Africa
Argentina
Israel
Brazil
Chile
Korea
Turkey
Czech Republic
Hungary
Greece
Thailand
Philippines
Malaysia
Venezuela
Indonesia
Peru
Poland
India
Egypt
Colombia
Taiwan
Sri Lanka
Jordan
Zimbabwe
Nigeria

Table 1a. *(Continued)*

Pakistan
Russia
Morocco
Slovakia
China
Third tier – Frontier markets
Estonia
Namibia
Botswana
Lithuania
Latvia
Lebanon
Mauritius
Ghana
Kenya
Slovenia
Tunisia

[a]Portugal has "graduated" from the IFC/S&P Emerging Market Index but was included in the Index for most of the time period covered by this study

turnover, value traded and number of shares. An overall level of relative development is calculated using a means-removed methodology that combines the four indicators (Demirguç-Kunt & Levine, 1996). The 59 markets are separated evenly into three tiers. As Table 1a shows, most of the frontier markets are ranked very low in the sample, while some of the Asian markets, like India, Korea and Taiwan, are ranked higher than some developed markets. Because global integration is a crucial issue in determining an appropriate cost of equity, markets in different stages of integration should be calculated using different risk measures. A simple estimate of the degree of global integration is the unconditional correlation with the Morgan Stanley World Index, as shown in Table 1c. The first tier has markets with a correlation between 1.0 and 0.5; the second tier markets have correlations between 0.5 and 0.25; and the third tier markets have correlations below 0.25.

As Tables 1a, 1b and 1c show, the rankings of countries by the three different methodologies can be extremely wide. India and Korea are considered emerging markets by the IFC/S&P database but are ranked second and third in terms of market development. Mexico is considered an emerging market by IFC/S&P and its development ranking is only 39, yet its correlation with the World Index is relatively high. China is considered an emerging market, but its development ranking is 15. Yet, it is a highly segmented

Table 1b. Market Tiers, as Defined by Market Indicators (2000 Data).

Country	Market Cap/GDP		Trading Value/GDP		Turnover Ratio		No. of Listed Companies		Rank
	Rank	Value (%)	Rank	Value (%)	Rank	Value (%)	Rank	Value (%)	
First tier markets									
United States	5	170.1	1	358.8	7	200.8	1	7524	1
India	34	31.0	10	106.7	4	306.5	2	5937	2
Korea	26	42.0	3	261.2	2	444.8	7	1308	3
Taiwan	16	85.8	2	340.8	3	315.4	19	531	4
Hong Kong	1	377.5	4	228.8	22	61.3	15	779	5
Canada	9	137.0	11	103.4	18	77.3	3	3977	6
Switzerland	2	289.3	5	222.4	16	82.0	28	252	7
United Kingdom	3	183.6	9	130.7	21	66.6	5	1904	8
Pakistan	51	11.9	20	59.8	1	486.9	16	762	9
Spain	15	86.5	7	169.1	5	210.7	11	1019	10
Singapore	7	160.1	12	95.9	5	210.7	21	418	11
The Netherlands	6	161.2	6	170.4	12	101.4	31	234	12
Japan	17	77.9	18	66.4	20	69.9	4	2561	13
Sweden	8	138.6	8	164.6	11	111.2	25	292	14
China	22	58.7	16	72.9	9	158.3	8	1086	15
South Africa	4	177.6	17	67.1	35	33.2	18	616	16
Turkey	29	36.6	13	94.3	8	196.5	24	315	17
Australia	13	96.3	21	57.0	25	55.8	6	1330	18
France	11	99.5	15	74.5	19	74.1	13	808	19
Malaysia	10	130.9	19	65.5	31	44.6	14	795	20
Second tier markets									
Germany	21	60.4	23	50.8	17	79.1	10	1022	21
Greece	12	98.4	14	84.4	23	60.4	23	329	22
Denmark	19	63.1	22	53.6	13	86.0	34	225	23
Portugal	25	55.1	24	49.4	15	85.5	43	109	24

Table 1b. (*Continued*)

Country	Market Cap/GDP		Trading Value/GDP		Turnover Ratio		No. of Listed Companies		Rank
	Rank	Value (%)	Rank	Value (%)	Rank	Value (%)	Rank	Value (%)	
Slovakia	59	3.8	42	4.5	10	122.3	12	838	25
Egypt	32	34.3	30	13.3	34	36.1	9	1076	26
Israel	24	57.6	26	21.0	32	36.6	17	654	27
Brazil	28	40.5	29	18.1	30	44.6	20	459	28
Chile	14	91.7	35	9.2	47	9.5	27	258	29
Hungary	37	24.8	25	25.1	14	85.8	48	60	30
Thailand	36	26.2	27	20.6	26	52.9	22	381	31
Philippines	18	77.6	32	12.3	42	16.4	32	230	32
New Zealand	31	34.9	28	20.2	29	45.9	39	144	33
Czech Rep	40	20.7	31	12.4	24	57.7	40	131	34
Poland	42	20.2	34	9.4	27	48.1	34	225	35
Jordan	20	61.2	38	5.1	50	7.6	38	163	36
Indonesia	43	20.1	33	10.7	37	31.5	25	292	37
Argentina	23	58.2	48	2.1	54	4.8	41	127	38
Mexico	38	22.1	36	8.0	36	32.5	37	179	39
Russia	54	9.7	39	5.1	33	36.6	29	249	40
Third tier countries									
Zimbabwe	27	41.3	40	4.7	45	11.3	46	69	41
Estonia	30	35.3	37	6.2	41	18.0	55	23	42
Latvia	56	9.0	43	3.6	28	47.8	47	64	43
Peru	41	20.3	46	2.9	44	12.7	32	230	44
Austria	46	14.5	41	4.6	38	29.8	44	97	45
Morocco	33	33.0	44	3.3	48	8.9	51	53	46
Tunisia	47	14.5	45	3.2	39	22.6	52	44	47
Mauritius	35	30.5	50	1.7	53	5.1	53	40	48
Sri Lanka	58	6.7	52	0.9	46	10.9	30	239	49

Table 1b. *(Continued)*

Country	Market Cap/GDP		Trading Value/GDP		Turnover Ratio		No. of Listed Companies		Rank
	Rank	Value (%)	Rank	Value (%)	Rank	Value (%)	Rank	Value (%)	
Slovenia	49	12.7	47	2.3	40	19.7	54	38	50
Nigeria	53	9.8	55	0.6	51	7.3	36	195	51
Lithuania	45	14.9	49	1.9	43	14.8	50	54	52
Colombia	50	12.6	57	0.5	57	3.8	42	126	53
Botswana	39	20.8	51	1.0	55	4.7	57	16	54
Venezuela	57	6.9	56	0.6	49	8.8	45	85	55
Kenya	48	12.8	58	0.5	58	3.5	49	57	56
Ghana	44	15.4	59	0.3	59	1.4	56	22	57
Namibia	52	11.1	53	0.8	56	4.4	58	13	58
Lebanon	55	9.2	54	0.7	52	6.7	59	12	59

[a]Market capitalisation/GDP is the market capitalisation at the end of the year divided by GDP for the year.
[b]Total value traded/GDP is the total value traded for the year divided by the GDP for the year.
[c]Turnover ratio is the total value traded for the year divided by the GDP for the year.
[d]Listed companies are the number of listed companies at the end of the year.
Source: S&P/IFC Emerging Market Factbook 2001.

Table 1c. Market Tiers, as Defined by Correlation with the World Market[a] (1996–2001).

Country	Correlation	
	Value	Rank
First tier markets – between 0.5 and 1.0		
United States	0.91	1
France	0.79	2
Germany	0.79	3
Sweden	0.77	4
United Kingdom	0.76	5
The Netherlands	0.75	6
Canada	0.74	7
Spain	0.69	8
Switzerland	0.63	9
Portugal	0.54	10
Hong Kong	0.54	11
Australia	0.51	12
Denmark	0.50	13
Mexico	0.50	14
South Africa	0.50	15
Second tier markets – between 0.25 and 0.49		
Singapore	0.44	16
Austria	0.43	17
Argentina	0.42	18
Israel	0.42	19
Brazil	0.39	20
Japan	0.38	21
Chile	0.37	22
Korea	0.33	23
New Zealand	0.32	24
Turkey	0.30	25
Czech Rep	0.29	26
Hungary	0.27	27
Greece	0.27	28
Thailand	0.26	29
Philippines	0.25	30
Third tier markets – between 0.0 and 0.24		
Malaysia	0.22	31
Venezuela	0.21	32
Indonesia	0.20	33
Peru	0.20	34
Estonia	0.18	35
Poland	0.14	36
India	0.11	37

Table 1c. (*Continued*)

Country	Correlation	
	Value	Rank
Egypt	0.11	38
Namibia	0.11	39
Colombia	0.09	40
Taiwan	0.06	41
Botswana	0.05	42
Sri Lanka	0.03	43
Jordan	0.03	44
Lithuania	0.03	45
Zimbabwe	0.03	46
Latvia	0.02	47
Lebanon	0.02	48
Nigeria	0.01	49
Pakistan	0.01	50
Russia	0.00	51
Morocco	–0.01	52
Mauritius	–0.01	53
Slovakia	–0.02	54
Ghana	–0.03	55
Kenya	–0.04	56
Slovenia	–0.05	57
China	–0.06	58
Tunisia	–0.07	59

[a]Morgan Stanley World Index.

market with one of the lowest correlations with the World Index in the sample. Austria is considered a development market, yet its development ranking as well as its correlation with the World Index places it in the second tier.

4. METHODOLOGY AND DATA

Given the concerns of non-normality and segmentation, the CAPM, and its estimated risk factor, beta, are not appropriate for calculating cost of equity in any non-normal and non-integrated market. As Table 2 shows, all markets in the sample, both developed and emerging, have some non-zero degree of skewness and therefore show non-normality. Moreover, no market has a perfect correlation with the Morgan Stanley World Index, shown in Table 1c, which suggests that all markets are either partially integrated or

Table 2. Summary of Risk Variables (Based on Weekly Dollar Returns, Sorted by Standard Deviation).

	μ	σ	β	IR	Size	Σ_{μ}	Σ_0	Σ_{Rf}	β^D	*VaR*	Skew	Kurt
Indonesia	−0.69	9.64	1.15	9.42	10.65	10.63	10.45	10.47	0.54	−22.96	−1.93	22.75
Turkey	0.19	8.74	1.30	8.33	10.98	9.83	9.82	9.84	3.15	−23.17	−1.33	10.24
Russia	0.63	8.40	0.02	8.40	10.99	9.19	9.19	9.18	1.49	−21.24	−0.47	6.09
Korea	−0.21	7.58	1.38	7.10	12.01	8.11	8.13	8.06	0.69	−18.48	−0.81	10.61
Thailand	−0.75	6.83	1.05	6.58	10.64	6.52	6.70	6.71	0.99	−15.24	0.31	5.13
Estonia	−0.01	6.66	0.58	6.55	7.18	7.17	7.17	7.20	0.17	−18.03	−1.34	12.06
Austria	−0.12	6.00	0.54	2.40	10.41	2.70	2.73	2.77	0.83	−6.19	−0.25	3.63
Venezuela	0.22	6.00	0.77	5.87	9.05	5.70	5.57	5.61	0.42	−12.32	0.27	4.67
Brazil	0.05	5.96	1.09	5.48	12.26	6.85	6.85	6.75	1.41	−15.54	−0.92	9.45
Zimbabwe	0.19	5.90	0.08	5.90	7.92	6.50	6.48	6.47	0.10	−15.76	−0.77	8.46
Latvia	0.28	5.56	0.07	5.56	5.90	5.16	5.23	5.20	0.82	−12.73	0.10	7.20
Lithuania	−0.04	5.18	0.05	5.17	7.15	3.68	3.66	3.65	−0.12	−8.89	5.00	54.13
Argentina	0.01	4.99	1.08	4.51	11.15	5.21	5.23	5.22	0.76	−12.02	−0.48	7.10
Mexico	0.24	4.91	1.23	4.23	11.75	5.14	5.15	5.17	1.19	−11.05	−0.20	5.20
Pakistan	−0.33	4.89	0.27	4.98	9.02	5.23	5.36	5.35	0.01	−12.20	−0.42	4.58
Philippines	−0.42	4.87	0.77	4.75	10.66	4.78	4.81	4.82	0.71	−11.56	0.39	8.25
Hungary	0.26	4.86	0.65	4.68	9.44	5.12	5.06	5.10	0.42	−11.26	−0.25	4.37
Malaysia	−0.20	4.83	0.72	4.77	11.86	4.59	4.65	4.60	0.27	−10.42	0.81	7.86
Poland	0.08	4.77	0.29	4.73	9.92	4.96	4.99	4.95	1.14	−11.06	−0.43	5.57
Greece	0.18	4.73	0.77	4.58	11.40	4.44	4.37	4.40	0.78	−9.51	0.15	4.13
Colombia	−0.24	4.47	0.44	4.55	9.50	4.39	4.47	4.47	0.28	−10.45	0.05	5.52
Taiwan	−0.13	4.45	0.11	4.45	12.57	4.63	4.66	4.71	0.26	−10.80	−0.45	5.92
Singapore	−0.19	4.42	0.91	4.03	11.84	4.36	4.36	4.40	0.45	−10.26	−0.34	12.85
Hong Kong	0.09	4.26	1.11	3.63	13.12	4.65	4.62	4.66	0.55	−10.17	−0.60	5.54
India	0.00	4.14	0.45	4.20	11.84	4.16	4.25	4.21	0.49	−8.41	0.04	3.37
China	0.49	4.03	−0.12	4.02	12.59	4.33	4.42	4.32	0.15	−8.87	−0.78	12.23
Namibia	−0.30	3.82	0.21	3.80	6.29	3.65	3.53	3.53	0.21	−9.47	0.69	15.64
Japan	−0.20	3.73	0.70	3.44	14.95	3.53	3.60	3.67	0.32	−8.15	0.16	3.96
South Africa	−0.14	3.63	0.89	3.17	12.27	4.07	4.07	4.08	1.20	−9.69	−1.25	9.06
Slovenia	−0.18	3.63	−0.04	3.63	7.55	3.54	3.58	3.63	−0.10	−8.68	0.11	5.99
New Zealand	0.04	3.62	0.53	3.44	10.15	3.74	3.75	3.79	0.41	−8.16	−0.18	3.15
Egypt	−0.08	3.57	0.20	3.55	10.16	3.47	3.49	3.51	0.58	−8.09	0.19	5.82
Czech Republic	−0.29	3.49	0.49	3.35	6.31	3.61	3.63	3.65	0.72	−8.11	−0.10	3.99
Portugal	0.25	3.43	0.78	3.05	10.96	3.13	3.14	3.12	0.93	−6.95	1.25	13.58
Sweden	0.14	3.38	1.23	2.31	12.65	3.52	3.50	3.52	1.08	−7.34	0.21	7.11
Israel	0.13	3.34	0.67	3.06	10.86	3.76	3.71	3.74	0.61	−8.14	−0.58	4.38
Chile	−0.11	3.22	0.74	3.03	11.05	3.29	3.32	3.34	0.24	−8.12	−0.40	6.03
Peru	−0.11	3.17	0.31	3.11	9.48	3.18	3.21	3.24	0.27	−7.81	−0.22	5.96
Canada	0.13	3.10	1.08	2.09	13.44	3.30	3.30	3.32	1.03	−7.33	−0.61	5.62
Ghana	−0.22	3.00	−0.04	3.00	7.06	2.81	2.77	2.76	0.11	−7.14	0.72	9.33
Spain	0.20	2.84	0.90	2.19	12.92	2.89	2.80	2.82	0.70	−6.34	−0.05	4.64
The Netherlands	0.18	2.81	0.96	2.04	13.31	3.07	3.09	3.11	0.66	−6.18	−0.27	4.94
France	0.22	2.81	1.03	1.90	13.95	2.81	2.70	2.74	0.63	−5.61	0.19	4.05

Table 2. (*Continued*)

	μ	σ	β	IR	Size	Σ_μ	Σ_0	Σ_{Rf}	β^D	*VaR*	Skew	Kurt
Nigeria	0.24	2.79	0.02	2.79	8.11	2.59	2.53	2.54	0.33	–6.15	0.48	6.93
Tunisia	–0.28	2.73	–0.09	2.72	7.88	2.82	2.71	2.64	–0.21	–7.18	0.34	21.51
Lebanon	–0.23	2.71	0.02	2.71	7.70	2.55	2.57	2.51	–0.32	–5.98	0.60	5.99
Germany	0.12	2.68	0.98	1.83	13.96	2.97	2.90	2.95	0.80	–6.24	–0.35	5.48
Switzerland	0.11	2.68	0.78	2.07	13.44	2.62	2.58	2.61	0.76	–5.63	–0.10	5.23
Slovakia	–0.30	2.57	–0.01	2.57	7.16	2.85	2.93	2.96	–0.16	–6.48	–0.49	4.17
Denmark	0.22	2.42	0.57	2.14	11.53	2.60	2.58	2.56	0.58	–5.42	–0.40	4.15
Sri Lanka	–0.34	2.39	0.04	2.40	7.42	2.66	2.64	2.63	0.00	–6.48	–0.48	5.69
Australia	0.02	2.33	0.57	2.03	12.79	2.35	2.34	2.38	0.42	–5.34	–0.31	3.75
Kenya	–0.38	2.33	–0.04	2.33	7.45	2.63	2.55	2.55	–0.18	–5.62	–1.54	17.88
United States	0.13	2.27	1.08	1.26	16.46	2.56	2.49	2.54	0.96	–5.45	–0.31	4.19
United Kingdom	0.13	2.27	0.81	1.59	14.72	2.37	2.35	2.35	0.68	–5.18	–0.34	3.88
Botswana	0.38	2.14	0.06	2.14	6.64	1.94	1.82	1.85	0.24	–4.04	0.45	6.93
Morocco	0.10	1.77	–0.01	1.77	9.48	1.57	1.53	1.57	0.07	–3.42	0.67	5.47
Jordan	–0.02	1.56	0.04	1.56	8.58	1.37	1.38	1.41	0.00	–3.20	0.66	6.00
Mauritius	–0.12	1.51	–0.01	1.51	7.41	1.45	1.50	1.54	–0.17	–3.52	–0.14	5.56
World	0.14	2.00	1.00	0.00	17.10	2.14	2.11	2.12	1.00	–4.19	–0.21	4.51

Note: μ, mean return; β, systematic risk (beta); σ, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; *VaR*, value at risk; skew, skewness; kurt, kurtosis.

entirely segmented, albeit to different extents. An alternative method of measuring the risk and cost of equity in emerging markets is required.

Several alternative methods have been suggested, including using risk ratings (Erb, Harvey, & Viskanta, 1995, 1996) and spreads of sovereign bonds (Godfrey & Espinosa, 1996). However, many emerging markets, particularly frontier markets, do not have dollar denominated debt, nor are they covered by risk rating services.

Estrada (2000) proposes that the costs of equity in emerging markets should be calculated using downside risk rather than the total risk measure of standard deviation and the systematic risk measure of beta. The probability of failure – whether it be the failure of a stabilisation plan, a currency regime or a political system – is central to assessing risk in emerging markets. Risk is generally considered to be the chance of loss, rather than overall volatility; therefore, downside risk measures, such as the semi-standard deviation, value at risk and downside beta are intuitively appealing as risk measures. The use of downside risk is supported by the models of Bawa and Lindenburg (1977), Harlow and Ramesh (1989), Sortino and van der Meer (1991) and Markowitz (1959). Harvey (2000) performs a study similar to that of Estrada (2000) on a wider range of markets, including developed markets. There has yet been no investigation, however, into frontier markets, which are the few markets that can be considered truly segmented. A contribution of this study is to test different risk measures on a wide sample that includes frontier markets.

This study follows a methodology similar to that of Estrada (2000) and Harvey (2000). The total sample and the three different sub-samples for each of the three different ranking methodologies are tested to determine an appropriate cost of equity. Different risk measures are calculated for each market. The full sample and nine different sub-samples are analysed via cross-sectional correlation matrices, as well as bivariate and multivariate regression, to determine which risk measures have the greatest relationship to each other and to mean returns. Cost of equity figures are then calculated for each market using the risk measures considered most appropriate.

4.1. Data and Measurement

A sample of 59 markets is used for this analysis, with varying levels of development and global integration. Included in this sample are 11 frontier markets: Botswana, Estonia, Ghana, Kenya, Latvia, Lebanon, Lithuania, Mauritius, Namibia, Slovenia and Tunisia. Calculations are based on weekly dollar returns on local stock market indices from January 1996 to June 2001. Indices were converted into dollar terms with the week-end exchange rates. World returns are based on the Morgan Stanley World Index. As cost of equity is calculated from an international investor's point of view rather than that of a local one, the three-month U.S. Treasury Bill rate is used for the global risk-free rate.

4.2. Estimating Measures of Risk

The alternative risk variables that will be tested are laid out below. Estimates of each measure for each country in the sample are presented in Table 2.

1. *The arithmetic mean (μ)* of the weekly dollar returns summarises the average performance of each market over the entire sample period and serves as a proxy for expected returns
2. *The systematic risk, or beta (β),* is the most commonly used measure of risk. As it measures the market's relative volatility in relation to the world, it can be translated as the risk inherent in the stock market as a

whole. In being applicable to all markets, it is regarded as non-diversifiable. The betas for each country were calculated by running a simple regression of their returns against those of the world market. This was done using the following regression equation:

$$RM_i - R_f = \gamma_1 + \beta(MR - R_f) + v_i \tag{2}$$

where RM_i and MR stand for the return on market i and the world return respectively, R_f is the risk free rate, γ_1 and β are the unknown constant and coefficient, respectively, and v_i is the residual.

3. *The total risk, or standard deviation (σ),* of the weekly dollar returns comprises systematic and non-systematic risk and is therefore considered a more appropriate measure of risk in segmented markets where there is little to no diversification opportunity. It is a measure of volatility that applies the same weight to upward and downward swings and may therefore be seen to be misleading for partially integrated markets.
4. *The idiosyncratic risk (IR)* is the variability of returns not explained by beta and is thus the volatility that is not correlated with the world. It reflects the fluctuations caused by the unique factors of the individual market and as such is an element of price risk that can usually be eliminated through diversification. This may not be the case in emerging markets where diversification opportunities are limited by the small number of listed securities. Idiosyncratic risk is therefore used to include the impact of diversifiable risk on returns. It is calculated by taking the standard deviation of the residual in Eq. (2).
5. *The downside risk* is the risk that asset returns are more correlated with the world market when it is falling (Ang, Chen, & Xing, 2005). Assets with a greater measure of downside risk could, as such, be less desirable and would therefore have to offer higher returns. Three forms of downside risk are calculated: semi-standard deviation, downside beta and value at risk.
   5.1. *The semi-standard deviation (Σ_B)* (semideviation) represents the standard deviation of all returns falling below the benchmark. The semideviation is calculated using the following equation:

$$\sum_B = \sqrt{(1/T)\sum_{t=1}^{T}(R_t - B)^2 \text{ for all } R_t < B} \tag{3}$$

where T expresses the sample size, t is the time period, R is the return and B represents the benchmark. It is important to note that this calculation applies only to periods during which the return is less than the variable (B).

Based on the approach in Estrada (2000), this study uses 0, the risk-free rate and the arithmetic mean as benchmark figures.

5.2. *The downside beta (β^D)* is the sensitivity of the market returns with respect to the world market returns when both markets simultaneously decrease (Estrada, 2000). In this calculation, all incidences where the individual market and world returns are both negative are isolated, and then a simple regression is run against those returns to calculate the beta.

5.3. *The value at risk (VaR)* reflects the potential downside risk faced on investments in terms of nominal losses. It is a statistical tool that quantifies the exposure of an asset or portfolio to market risk, as such, estimating the level of loss that is expected to be equalled or exceeded with a small, given probability (Schachter, 1997). It can then be interpreted that there is an x percent chance of losing y amount of dollars over a certain holding period. The greater the desired confidence level, the greater the measure of risk will be. There are many methods of calculating this figure, but the historical simulation is the only one that is free from distributional assumptions (Schachter, 1997) and is therefore the only method applicable to emerging markets. The value at risk was calculated by taking the arithmetic mean of returns below the fifth percentile level (i.e., a 95 percent confidence level).

6. *The size* is considered to be a proxy for the age or maturity of a market. The size of each market was calculated by taking the log of the average market capitalisation of each country, over the entire period.
7. *The skewness* measures the extent to which the distribution is non-symmetrical. The skewness of a symmetrical distribution, such as the normal distribution, is zero. If the upper tail of the distribution is thicker than the lower tail, the skewness will be positive.
8. *The kurtosis* measures the extent to which a distribution is "punched in" or "filled out". The kurtosis of a normal distribution is 3. If the distribution has thicker tails than a normal distribution, then the kurtosis will exceed 3.

Table 2 is ranked according to the total risk (standard deviation). Indonesia ranks highest according to risk, and some of the other risk measures, such as idiosyncratic risk and semideviation, decline in a fashion similar to the total risk. However, the mean returns do not show that a higher risk means a higher reward, as the CAPM would indicate. The beta, downside beta, size, skewness and kurtosis values seem to show a lack of relationship to total risk across the sample.

Beta is decidedly close to zero in most third tier markets, indicating a lack of a significant relationship with global markets and lower systematic risk. This suggests that these markets are highly segmented from the rest of the world, and using beta as a risk measure would make the cost of equity much lower than it likely should be. Most first and second tier markets have betas closer to 1, with the notable exceptions of China, India and Taiwan.

5. FINDINGS

5.1. Cross-Sectional Correlation Matrices

Correlation matrices are calculated for the total sample and each sub-sample. The results shown in Table 3 for the full sample suggests that both size and downside risk (as measured by the downside beta) have a close relationship with mean returns. Size could be related to liquidity and to information factors. There is a lack of relationship between mean returns and beta while the downside risk (as measured by downside beta) appears to have a more significant relationship to mean returns. This suggests that most markets are not completely integrated but perhaps partially integrated and certainly more sensitive to global markets during a downturn.

Within first tier markets, the relevance of different risk measures changes depending on what methodology is used to split the sample. First tier markets are defined as developed markets by IFC/S&P, and a correlation based on that definition shows that there are significant relationships between returns and a variety of different risk measures, including the idiosyncratic risk and total risk. The last two risk variables show negative relationships with mean returns, which is counterintuitive. A correlation matrix of first tier rankings based on the development methodology suggests a similar result, where the idiosyncratic risk and total risk also have a negative sign. The first tier as defined by correlations with world returns suggests that skewness is closely related to mean returns. However, skewness has a significant positive correlation with mean returns, a result that is counterintuitive. The relationship between the skewness and mean returns should be negative because if the skewness is high and positive, prices are high and expected returns are low. If the skewness is negative, prices are low and expected returns are high.

Second tier markets show a strong correlation between mean returns and the downside beta, across all methodologies of splitting the sample. The sub-

Table 3. Cross-Sectional Correlation Matrices.

	μ	σ	β	IR	Size	β^D	VaR	Σ_μ	Σ_0	Σ_{Rf}	Skew	Kurt
(a) Full sample												
μ	1.00											
σ	−0.09	1.00										
β	0.02	0.33	1.00									
IR	−0.12	0.96	0.19	1.00								
Size	0.26	−0.01	0.68	−0.14	1.00							
β^D	0.32	0.47	0.64	0.36	0.45	1.00						
VaR	0.09	−0.95	−0.32	−0.97	0.03	−0.48	1.00					
Σ_μ	−0.06	0.95	0.37	0.96	0.04	0.50	−0.99	1.00				
Σ_0	−0.07	0.96	0.37	0.96	0.04	0.50	−0.99	1.00	1.00			
Σ_{Rf}	−0.07	0.96	0.37	0.96	0.04	0.51	−0.99	1.00	1.00	1.00		
Skew	0.04	−0.22	−0.28	−0.18	−0.24	−0.29	0.34	−0.37	−0.37	−0.37	1.00	
Kurt	−0.19	0.23	−0.16	0.27	−0.28	−0.18	−0.18	0.16	0.16	0.15	0.52	1.00
(b) First-Tier Markets												
As defined by IFC/S&P												
μ	1.00											
σ	−0.67	1.00										
β	0.37	−0.17	1.00									
IR	−0.66	0.63	−0.16	1.00								
Size	0.21	−0.56	0.51	−0.46	1.00							
β^D	0.44	−0.09	0.58	−0.60	0.23	1.00						
VaR	0.53	−0.58	−0.22	−0.91	0.27	0.32	1.00					
Σ_μ	−0.39	0.52	0.32	0.87	−0.25	−0.26	−0.98	1.00				
Σ_0	−0.43	0.54	0.28	0.88	−0.27	−0.27	−0.98	1.00	1.00			
Σ_{Rf}	−0.44	0.55	0.28	0.88	−0.26	−0.28	−0.99	1.00	1.00	1.00		
Skew	−0.04	−0.03	0.03	−0.03	0.09	−0.05	0.17	−0.14	−0.14	−0.13	1.00	
Kurt	−0.34	0.26	0.38	0.47	−0.12	0.02	−0.61	0.57	0.57	0.56	−0.11	1.00
As defined by development indicators												
μ	1.00											
σ	−0.28	1.00										
β	0.02	0.20	1.00									
IR	−0.34	0.98	0.03	1.00								
Size	0.37	−0.60	0.23	−0.66	1.00							
β^D	0.28	0.47	0.59	0.35	−0.05	1.00						
VaR	0.27	−0.99	−0.23	−0.96	0.59	−0.54	1.00					
Σ_μ	−0.22	0.99	0.22	0.97	−0.58	0.53	−1.00	1.00				
Σ_0	−0.23	0.99	0.20	0.97	−0.60	0.51	−0.99	1.00	1.00			
Σ_{Rf}	−0.24	0.99	0.21	0.97	−0.59	0.52	−1.00	1.00	1.00	1.00		
Skew	−0.12	−0.43	−0.10	−0.40	0.22	−0.51	0.53	−0.52	−0.51	−0.51	1.00	
Kurt	−0.01	0.59	0.06	0.57	−0.39	0.24	−0.58	0.58	0.58	0.58	−0.45	1.00

Table 3. (*Continued*)

	μ	σ	β	IR	Size	β^D	VaR	Σ_μ	Σ_0	Σ_{Rf}	Skew	Kurt
As defined by correlations with world returns												
μ	1.00											
σ	0.03	1.00										
β	0.14	0.58	1.00									
IR	−0.03	0.95	0.30	1.00								
Size	−0.14	−0.50	0.24	−0.67	1.00							
β^D	−0.14	0.50	0.57	0.36	−0.12	1.00						
VaR	0.21	−0.96	−0.55	−0.92	0.42	−0.54	1.00					
Σ_μ	−0.09	0.98	0.63	0.91	−0.40	0.51	−0.99	1.00				
Σ_0	−0.09	0.98	0.61	0.91	−0.42	0.52	−0.99	1.00	1.00			
Σ_{Rf}	−0.10	0.97	0.62	0.91	−0.40	0.51	−0.99	1.00	1.00	1.00		
Skew	0.70	−0.02	−0.04	−0.02	−0.26	−0.06	0.28	−0.22	−0.21	−0.22	1.00	
Kurt	−0.05	0.38	0.01	0.43	−0.54	0.48	−0.33	0.27	0.29	0.27	0.46	1.00
(c) Second-Tier Markets.												
As defined by IFC/S&P.												
μ	1.00											
σ	−0.06	1.00										
β	−0.24	0.56	1.00									
IR	−0.07	0.99	0.49	1.00								
Size	0.18	0.35	0.47	0.31	1.00							
β^D	0.23	0.58	0.58	0.53	0.38	1.00						
VaR	0.06	−0.98	−0.53	−0.98	−0.31	−0.61	1.00					
Σ_μ	−0.04	0.99	0.54	0.98	0.34	0.59	−0.99	1.00				
Σ_0	−0.05	0.99	0.54	0.98	0.34	0.59	−0.99	1.00	1.00			
Σ_{Rf}	−0.05	0.99	0.54	0.98	0.34	0.59	−1.00	1.00	1.00	1.00		
Skew	0.10	−0.53	−0.26	−0.51	−0.18	−0.31	0.62	−0.62	−0.62	−0.62	1.00	
Kurt	−0.15	0.49	0.34	0.48	0.30	0.19	−0.49	0.51	0.51	0.50	−0.42	1.00
As defined by development indicators												
μ	1.00											
σ	−0.21	1.00										
β	−0.25	0.35	1.00									
IR	−0.22	0.99	0.26	1.00								
Size	0.31	0.20	0.59	0.12	1.00							
β^D	0.33	0.55	0.36	0.50	0.50	1.00						
VaR	0.18	−0.99	−0.31	−0.98	−0.20	−0.54	1.00					
Σ_μ	−0.17	0.99	0.33	0.98	0.21	0.54	−1.00	1.00				
Σ_0	−0.18	0.99	0.33	0.98	0.20	0.54	−1.00	1.00	1.00			
Σ_{Rf}	−0.18	0.99	0.33	0.98	0.20	0.54	−1.00	1.00	1.00	1.00		
Skew	0.16	−0.51	−0.24	−0.49	−0.13	−0.06	0.57	−0.60	−0.59	−0.59	1.00	
Kurt	−0.36	0.57	0.38	0.55	0.17	0.10	−0.55	0.58	0.57	0.57	−0.35	1.00

Table 3. (*Continued*)

	μ	σ	β	IR	Size	β^D	VaR	Σ_μ	Σ_0	Σ_{Rf}	Skew	Kurt
As defined by correlations with world returns												
μ	1.00											
σ	−0.07	1.00										
β	−0.06	0.79	1.00									
IR	−0.07	0.86	0.87	1.00								
Size	0.04	0.14	0.39	0.14	1.00							
β^D	0.21	0.76	0.57	0.71	−0.02	1.00						
VaR	−0.01	−0.87	−0.90	−0.98	−0.16	−0.78	1.00					
Σ_μ	0.05	0.87	0.89	0.98	0.15	0.77	−1.00	1.00				
Σ_0	0.03	0.87	0.89	0.98	0.15	0.77	−1.00	1.00	1.00			
Σ_{Rf}	0.03	0.87	0.89	0.98	0.15	0.77	−1.00	1.00	1.00	1.00		
Skew	−0.54	−0.47	−0.56	−0.43	−0.08	−0.61	0.59	−0.60	−0.59	−0.58	1.00	
Kurt	−0.06	0.50	0.75	0.57	0.29	0.38	−0.64	0.62	0.61	0.61	−0.52	1.00
(d) Third-Tier Markets												
As defined by IFC/S&P												
μ	1.00											
σ	0.29	1.00										
β	0.22	0.71	1.00									
IR	0.29	1.00	0.70	1.00								
Size	−0.59	−0.39	−0.29	−0.39	1.00							
β^D	0.68	0.51	0.33	0.52	−0.91	1.00						
VaR	−0.17	−0.95	−0.80	−0.94	0.32	−0.49	1.00					
Σ_μ	0.20	0.95	0.80	0.95	−0.32	0.50	−1.00	1.00				
Σ_0	0.21	0.95	0.80	0.95	−0.31	0.50	−1.00	1.00	1.00			
Σ_{Rf}	0.21	0.95	0.80	0.95	−0.32	0.50	−0.99	1.00	1.00	1.00		
Skew	0.13	0.17	−0.21	0.18	−0.07	−0.11	0.12	−0.13	−0.13	−0.14	1.00	
Kurt	−0.12	0.31	−0.02	0.32	0.10	−0.23	−0.08	0.09	0.08	0.07	0.78	1.00
As defined by development indicators												
μ	1.00											
σ	0.27	1.00										
β	0.16	0.69	1.00									
IR	0.31	0.87	0.52	1.00								
Size	−0.05	0.10	0.47	−0.16	1.00							
β^D	0.49	0.55	0.56	0.30	0.23	1.00						
VaR	−0.21	−0.85	−0.51	−0.95	0.15	−0.28	1.00					
Σ_μ	0.26	0.86	0.56	0.96	−0.10	0.31	−0.99	1.00				
Σ_0	0.25	0.87	0.56	0.96	−0.09	0.31	−0.99	1.00	1.00			
Σ_{Rf}	0.26	0.87	0.57	0.96	−0.09	0.32	−0.99	1.00	1.00	1.00		
Skew	0.11	0.03	−0.18	0.08	−0.13	−0.14	0.17	−0.18	−0.18	−0.19	1.00	
Kurt	−0.14	0.14	−0.21	0.23	−0.30	−0.34	−0.07	0.05	0.04	0.03	0.75	1.00

Table 3. (*Continued*)

	μ	σ	β	IR	Size	β^D	VaR	Σ_μ	Σ_0	Σ_{Rf}	Skew	Kurt
As defined by correlations with world returns												
μ	1.00											
σ	0.09	1.00										
β	−0.30	0.64	1.00									
IR	0.10	1.00	0.63	1.00								
Size	0.15	0.31	0.34	0.32	1.00							
β^D	0.49	0.60	0.30	0.60	0.39	1.00						
VaR	−0.06	−0.98	−0.59	−0.98	−0.27	−0.57	1.00					
Σ_μ	0.06	0.98	0.62	0.98	0.35	0.59	−0.99	1.00				
Σ_0	0.07	0.98	0.62	0.98	0.36	0.60	−0.99	1.00	1.00			
Σ_{Rf}	0.07	0.98	0.62	0.98	0.35	0.60	−0.99	1.00	1.00	1.00		
Skew	0.12	−0.22	−0.23	−0.21	−0.22	−0.20	0.36	−0.38	−0.38	−0.38	1.00	
Kurt	−0.18	0.22	0.02	0.22	−0.19	−0.22	−0.12	0.11	0.10	0.10	0.57	1.00

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; VaR, value at risk; skew, skewness; kurt, kurtosis.

sample resulting from the IFC/S&P definitions have relatively fewer significant relationships between mean returns and risk variables, suggesting that the category named "emerging markets" includes markets that actually have little in common in terms of their risk/return characteristics. The split determined by the ranking of correlations with world returns shows a high correlation between the skewness and mean returns, but the relationship is appropriately negative. This suggests that the measure of skewness in partially segmented markets is important for a correct determination of the risk/return profile of these markets.

Within the third tier markets, the downside beta also has a high correlation with mean returns no matter how the sample is divided. It should be noted, however, that the difference in correlation matrices between the ranking methodologies is more pronounced in the first and second tier markets. Most markets that are ranked as third tier by one methodology are ranked third tier by all; therefore, the sub-sample changes little.

5.2. Cross-Sectional Bivariate Regression Results

The results of bivariate regressions in Tables 4–4c show more difference in the ranking methodologies. The development methodology yields very few significant results, suggesting that the markets that are ranked together do

Table 4. Results of Cross-Sectional Bivariate Regressions Based on the Equation $MR_i = \gamma_0 + \gamma_1 RV_i + \upsilon_i$.

Risk Variable	γ_1	p-Value	Adj. R^2
Full sample			
σ	−0.01	0.49	−0.01
β	0.01	0.85	−0.02
IR	−0.02	0.35	0.00
Size	0.03	0.05	0.05
β^D	0.15	0.01	0.09
VaR	0.01	0.48	−0.01
Σ_μ	−0.01	0.65	−0.01
Skew	0.01	0.76	−0.02
Kurt	−0.01	0.16	0.02

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; VaR, value at risk; skew, skewness; kurt, kurtosis.

not actually share risk/return characteristics. The same is true for the second tier of the IFC/S&P rankings, i.e., those markets that are commonly categorised as emerging markets.

However, the results for the first and third tier markets show more definitive results, as ranked by both IFC/S&P and correlations with the world returns. First tier markets, as ranked by the IFC/S&P, show significant relationships between mean returns and value at risk and downside beta. Significant relationships are also found between mean returns and standard deviation and idiosyncratic risk, but with the wrong sign. First tier markets, as ranked by correlations with world returns, show a significant relationship with the skewness, but again with the wrong sign. Third tier markets, as defined by both methodologies, show a significant relationship between mean returns and the downside beta.

5.3. Cross-Sectional Multivariate Regression Results

Multivariable regressions, reported in Tables 5–5c, are meant to shed more light on the results in the previous two tables and to identify cross relationships between the risk variables and mean returns. For the full sample, the size and downside beta continue to show significant relationships with mean returns, whether combined with other variables or not. However, neither variable explains more than 16 percent of variations in mean returns

Table 4a. Results of Cross-Sectional Bivariate Regressions – First Tier Markets Based on Equation $MR_i = \gamma_0 + \gamma_1 RV_i + \upsilon_i$.

Risk Variable	γ_1	p-Value	Adj. R^2
First tier as defined by IFC/S&P			
σ	−0.09	0.00	0.41
β	0.22	0.15	0.08
IR	−0.11	0.01	0.40
Size	0.02	0.44	−0.03
β^D	0.26	0.09	0.13
VaR	0.04	0.03	0.23
Σ_μ	−0.08	0.14	0.09
Skew	−0.02	0.87	−0.07
Kurt	−0.02	0.19	0.06
First tier as defined by development indicators			
σ	−0.03	0.23	0.03
β	0.01	0.92	−0.06
IR	−0.04	0.14	0.07
Size	0.05	0.11	0.09
β^D	0.08	0.24	0.02
VaR	0.01	0.24	0.02
Σ_μ	−0.02	0.35	0.00
Skew	−0.05	0.61	−0.04
Kurt	0.00	0.98	−0.06
First tier as defined by correlations with world returns			
σ	0.00	0.93	−0.08
β	0.07	0.62	−0.06
IR	0.00	0.92	−0.08
Size	−0.01	0.63	−0.06
β^D	−0.06	0.62	−0.06
VaR	0.01	0.45	−0.03
Σ_μ	−0.01	0.75	−0.07
Skew	0.13	0.00	0.45
Kurt	0.00	0.87	−0.07

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; VaR, value at risk; skew, skewness; kurt, kurtosis.

in multivariate regression or 10 percent in bivariate regressions. This suggests that one risk variable is not appropriate for all markets.

For the first tier markets, some combination of downside risk variables – and most often value at risk and semideviation – shows

Table 4b. Results of Cross-Sectional Bivariate Regressions for Second Tier Markets Based on Equation $MR_i = \gamma_0 + \gamma_1 RV_i + \upsilon_i$.

Risk Variable	γ_1	p-Value	Adj. R^2
Second tier as defined by IFC/S&P			
σ	−0.01	0.75	−0.03
β	−0.16	0.19	0.02
IR	−0.01	0.72	−0.03
Size	0.03	0.33	0.00
β^D	0.11	0.21	0.02
VaR	0.00	0.76	−0.03
Σ_μ	−0.01	0.84	−0.03
Skew	0.05	0.57	−0.02
Kurt	−0.01	0.41	−0.01
Second tier as defined by development indicators			
σ	−0.03	0.38	−0.01
β	−0.21	0.30	0.01
IR	−0.04	0.34	0.00
Size	0.06	0.19	0.04
β^D	0.26	0.16	0.06
VaR	0.01	0.44	−0.02
Σ_μ	−0.03	0.48	−0.03
Skew	0.09	0.49	−0.03
Kurt	−0.03	0.12	0.08
Second tier as defined by correlations with world returns			
σ	−0.01	0.80	−0.07
β	−0.06	0.82	−0.07
IR	−0.01	0.80	−0.07
Size	0.01	0.88	−0.07
β^D	0.08	0.46	−0.03
VaR	0.00	0.97	−0.08
Σ_μ	0.01	0.85	−0.07
Skew	−0.31	0.04	0.24
Kurt	−0.01	0.84	−0.07

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; VaR, value at risk; skew, skewness; kurt, kurtosis.

significant relationships with mean returns, across all sub-samples. The sub-sample based on development indicators has less significant results than those based on IFC/S&P definitions or correlations with world returns.

Table 4c. Results of Cross-Sectional Bivariate Regressions for Third Tier Markets Based on Equation $MR_i = \gamma_0 + \gamma_1 RV_i + \upsilon_i$.

Risk Variable	γ_1	p-Value	Adj. R^2
Third tier as defined by IFC/S&P			
σ	0.04	0.40	−0.02
β	0.28	0.52	−0.06
IR	0.04	0.39	−0.02
Size	−0.23	0.06	0.27
β^D	0.51	0.02	0.40
VaR	−0.01	0.61	−0.08
Σ_μ	0.03	0.55	−0.07
Skew	0.02	0.70	−0.09
Kurt	0.00	0.73	−0.10
Third tier as defined by development indicators			
σ	0.04	0.26	0.02
β	0.15	0.51	−0.03
IR	0.05	0.19	0.05
Size	−0.01	0.84	−0.06
β^D	0.36	0.03	0.20
VaR	−0.01	0.38	−0.01
Σ_μ	0.04	0.28	0.01
Skew	0.02	0.64	−0.05
Kurt	0.00	0.55	−0.04
Third tier as defined by correlations with world returns			
σ	0.01	0.63	−0.03
β	−0.29	0.11	0.06
IR	0.01	0.61	−0.03
Size	0.02	0.44	−0.01
β^D	0.35	0.01	0.21
VaR	0.00	0.76	−0.03
Σ_μ	0.01	0.74	−0.03
Skew	0.03	0.52	−0.02
Kurt	−0.01	0.34	0.00

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; VaR, value at risk; skew, skewness; kurt, kurtosis.

The second tier markets show that the sub-sample created by the correlations gives more significant results than the other two methodologies. The downside beta appears to be significant in the other two methodologies, but the correlation with world returns brings light on the importance of the skewness to partially segmented markets.

Table 5. Results of Cross-Sectional Multivariate Regression Full Sample Based on Equation $MR_i = \gamma_0 + \gamma_1 RV_{1i} + \gamma_2 RV_{2i} + \upsilon_i$.

Risk Variable	γ_1	p-Value	γ_2	p-Value	Adj. R^2
Full sample					
β^D/IR	0.20	0.00	−0.04	0.04	0.14
β^D/σ	0.23	0.00	−0.05	0.02	0.15
β^D/VaR	0.23	0.00	0.02	0.02	0.16
β^D/Σ_μ	0.23	0.00	−0.04	0.04	0.14
β^D/skew	0.17	0.01	0.04	0.26	0.09
β^D/β	0.25	0.00	−0.18	0.06	0.13
β^D/kurt	0.14	0.02	0.00	0.30	0.09
β^D/size	0.12	0.07	0.01	0.32	0.09
Size/IR	0.03	0.07	−0.01	0.50	0.04
Size/σ	0.03	0.05	−0.01	0.50	0.04
Size/VaR	0.03	0.05	0.00	0.50	0.04
Size/Σ_μ	0.03	0.05	−0.01	0.59	0.04
Size/skew	0.03	0.04	0.03	0.42	0.04
Size/kurt	0.02	0.10	0.00	0.35	0.05
Size/β	0.05	0.01	−0.17	0.11	0.08

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; *VaR*, value at risk; skew, skewness; kurt, kurtosis.

For the third tier markets, the downside beta is clearly the risk variable with the most significant relationship to mean returns, across all methodologies.

6. AN APPROPRIATE COST OF EQUITY

The results above suggest several things. First, the most useful division of markets into sub-samples comes from the correlation with world returns, which is a rough estimation of global integration. The results from the sub-samples created by that ranking, often agreeing with those sub-samples created from other rankings, suggest that for first tier markets, some form of downside risk, either value at risk or semideviation, creates the most appropriate risk/return profile and therefore the most appropriate cost of equity. For second tier markets, the degree of skewness appears most appropriate. For third tier markets, the downside risk provides the best risk estimate.

Table 5a. Results of Cross-Sectional Multivariate Regression First Tier Based on Equation $MR_i = \gamma_0 + \gamma_1 RV_{1i} + \gamma_2 RV_{2i} + \upsilon_i$.

Risk Variable	γ_1	p-Value	γ_2	p-Value	Adj. R^2
First tier as defined by IFC/S&P					
σ/β	−0.08	0.01	0.16	0.19	0.45
σ/size	−0.11	0.00	−0.02	0.32	0.42
$\sigma/\beta^{\mathrm{D}}$	−0.09	0.00	0.23	0.05	0.45
σ/VaR	−0.07	0.04	0.02	0.41	0.40
σ/Σ_μ	−0.09	0.02	−0.01	0.84	0.37
σ/skew	−0.09	0.01	−0.03	0.76	0.37
σ/kurt	−0.08	0.01	−0.01	0.40	0.41
IR/β	−0.10	0.01	0.16	0.18	0.44
IR/size	−0.12	0.01	−0.01	0.59	0.37
IR/β^D	−0.10	0.03	0.04	0.81	0.35
IR/VaR	−0.18	0.05	−0.03	0.40	0.39
IR/Σ_μ	−0.22	0.00	0.14	0.06	0.51
IR/skew	−0.11	0.01	−0.03	0.78	0.35
IR/kurt	−0.11	0.02	0.00	0.86	0.35
β^D/σ	0.23	0.05	−0.09	0.00	0.45
β^D/kurt	0.27	0.07	−0.02	0.15	0.21
VaR/size	0.04	0.06	0.01	0.78	0.18
VaR/β^{D}	0.04	0.08	0.18	0.22	0.26
VaR/β	0.05	0.01	0.30	0.02	0.46
VaR/Σ_μ	0.33	0.00	0.69	0.00	0.71
VaR/skew	0.05	0.04	−0.07	0.57	0.19
β/VaR	0.30	0.02	0.05	0.01	0.46
β/Kurt	0.35	0.02	−0.03	0.03	0.33
β/Σ_μ	0.33	0.03	−0.11	0.02	0.34
First tier as defined by development indicators					
β^D/IR	0.14	0.05	−0.05	0.03	0.21
β^D/σ	0.16	0.04	−0.06	0.04	0.21
β^D/VaR	0.18	0.02	0.03	0.02	0.25
β^D/Σ_μ	0.17	0.04	−0.05	0.05	0.18
Size/skew	0.05	0.08	−0.09	0.35	0.09
Size/kurt	0.06	0.09	0.01	0.50	0.06
Size/β^D	0.05	0.09	0.09	0.19	0.13
VaR/Σ_μ	0.25	0.01	0.59	0.02	0.28
VaR/skew	0.02	0.09	−0.15	0.17	0.08
First tier as defined by correlations with world returns					
Skew/σ	0.13	0.01	0.01	0.84	0.41
Skew/IR	0.13	0.01	0.00	0.95	0.41

Table 5a. (*Continued*)

Risk Variable	γ_1	p-Value	γ_2	p-Value	Adj. R^2
Skew/β	0.13	0.00	0.08	0.43	0.44
Skew/size	0.13	0.01	0.00	0.83	0.41
Skew/β^D	0.13	0.01	−0.04	0.63	0.42
Skew/VaR	0.13	0.01	0.00	0.92	0.41
Skew/Σ_μ	0.13	0.01	0.01	0.76	0.41
Skew/kurt	0.17	0.00	−0.02	0.03	0.60
VaR/σ	0.15	0.00	0.37	0.00	0.64
VaR/IR	0.06	0.09	0.13	0.13	0.09
VaR/Σ_μ	0.22	0.00	0.49	0.00	0.47

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; VaR, value at risk; skew, skewness; kurt, kurtosis.

The above results, however, are only useful if they can be used to estimate an intuitively appropriate cost of equity. For that purpose, the perspective of an international, diversified investor is used. When such an investor considers an investment, the required rate of return can be thought of as having two components, namely a risk-free rate and a risk premium:

$$RR_i = R_\mathrm{f} + (RP_\mathrm{w})(RM_i) \tag{4}$$

where RR_i is the required return, R_f is the risk-free rate, RP_w is the world market risk premium, RM_i is a risk measure and i indexes markets. A risk-free rate of 3.56 percent is the three-month U.S. Treasury Bill rate on the last day of the sample period. The world market risk premium is estimated at 6 percent, which agrees with that used in cost of equity calculations estimated by Korolyi and Stultz (2001).

We calculate the cost of equity using six different risk measures: total risk (measured by standard deviation), systematic risk (measured by beta), value at risk, downside beta, skewness and semi-standard deviation with respect to the mean. The calculations are as follows:

1. Total risk

$$CE_\sigma = R_\mathrm{f} + (RP_\mathrm{w})(\sigma_i/\sigma_\mathrm{w}) \tag{5}$$

2. Systematic risk

$$CE_\beta = R_\mathrm{f} + (RP_\mathrm{w})(\beta_i/\beta_\mathrm{w}) \tag{6}$$

Table 5b. Results of Cross-Sectional Multivariate Regression Second Tier Based on Equation $MR_i = \gamma_0 + \gamma_1 RV_{1i} + \gamma_2 RV_{2i} + \upsilon_i$.

Risk Variables	γ_1	*p*-Value	γ_2	*p*-Value	Adj. R^2
Second tier as defined by IFC/S&P					
β^D/β	0.26	0.01	−0.38	0.01	0.20
β^D/size	0.18	0.09	−0.04	0.22	0.04
β^D/σ	0.19	0.08	−0.04	0.19	0.04
β^D/VaR	0.20	0.07	0.02	0.17	0.05
β^D/Σ_μ	0.19	0.09	−0.04	0.23	0.04
β/β^D	−0.38	0.01	0.26	0.01	0.20
β/size	−0.28	0.04	0.07	0.06	0.11
Second tier as defined by development indicators					
β^D/IR	0.46	0.02	−0.08	0.04	0.22
β^D/σ	0.49	0.02	−0.09	0.03	0.24
β^D/VaR	0.48	0.02	0.03	0.05	0.20
β^D/Σ_μ	0.46	0.03	−0.07	0.07	0.19
β^D/kurt	0.29	0.10	−0.03	0.08	0.17
β^D/β	0.38	0.05	−0.36	0.08	0.17
Size/β	0.14	0.01	−0.56	0.01	0.30
Size/kurt	0.07	0.09	−0.03	0.06	0.18
Second tier as defined by correlations with world returns					
Skew/σ	−0.42	0.01	−0.07	0.11	0.34
Skew/IR	−0.39	0.01	−0.06	0.16	0.31
Skew/β	−0.47	0.01	−0.51	0.05	0.41
Skew/size	−0.31	0.04	0.00	1.00	0.18
Skew/β^D	−0.38	0.05	−0.08	0.51	0.21
Skew/VaR	−0.46	0.01	0.03	0.10	0.35
Skew/Σ_μ	−0.45	0.01	−0.06	0.15	0.32
Skew/kurt	−0.44	0.01	−0.04	0.09	0.36
Σ_μ/IR	0.37	0.03	−0.44	0.03	0.23

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; *VaR*, value at risk; skew, skewness; kurt, kurtosis.

3. Downside risk

3.1. Semi-standard deviation with respect to the mean

$$CE_{\Sigma\mu} = R_\mathrm{f} + RP_\mathrm{w}(\Sigma_{\mu,i}/\Sigma_{\mu,w}) \tag{7}$$

Table 5c. Results of Cross-Sectional Multivariate Regression Third Tier Based on Equation $MR_i = \gamma_0 + \gamma_1 RV_{1i} + \gamma_2 RV_{2i} + \upsilon_i$.

Risk Variable	γ_1	p-Value	γ_2	p-Value	Adj. R^2
Third tier as defined by IFC/S&P					
β^D/IR	0.54	0.04	−0.01	0.79	0.33
β^D/σ	0.54	0.04	−0.01	0.79	0.33
β^D/VaR	0.59	0.03	0.01	0.48	0.36
β^D/Σ_μ	0.57	0.03	−0.03	0.57	0.35
β^D/skew	0.52	0.02	0.03	0.43	0.37
β^D/kurt	0.51	0.03	0.00	0.89	0.32
β^D/β	0.51	0.04	−0.01	0.98	0.32
Size/β	−0.23	0.09	0.07	0.87	0.18
Size/Σ_μ	−0.23	0.09	0.00	0.95	0.18
Size/skew	−0.23	0.08	0.01	0.76	0.19
Size/kurt	−0.23	0.08	0.00	0.83	0.19
Third tier as defined by development indicators					
β^D/IR	0.32	0.07	0.03	0.42	0.18
β^D/σ	0.36	0.08	0.00	0.98	0.15
β^D/VaR	0.34	0.06	0.00	0.73	0.15
β^D/Σ_μ	0.33	0.06	0.02	0.60	0.16
β^D/skew	0.38	0.03	0.03	0.39	0.18
β^D/kurt	0.37	0.05	0.00	0.92	0.15
β^D/β	0.43	0.04	−0.15	0.53	0.17
β^D/size	0.39	0.03	−0.03	0.45	0.18
Third tier as defined by correlations with world returns					
β^D/σ	0.48	0.00	−0.05	0.15	0.25
β^D/IR	0.48	0.00	−0.05	0.15	0.24
β^D/β	0.46	0.00	−0.48	0.00	0.42
β^D/size	0.36	0.01	−0.01	0.79	0.18
β^D/skew	0.38	0.00	0.06	0.19	0.23
β^D/VaR	0.49	0.00	0.02	0.11	0.26
β^D/Σ_μ	0.50	0.00	−0.05	0.10	0.27
β^D/kurt	0.34	0.01	2.70	0.65	0.19
β/VaR	−0.49	0.03	−0.02	0.12	0.11
β/size	−0.38	0.05	0.04	0.15	0.10
β/β^D	−0.48	0.00	0.46	0.00	0.42
β/σ	−0.59	0.01	0.07	0.04	0.17
β/IR	−0.58	0.01	0.07	0.04	0.17
β/Σ_μ	−0.54	0.02	0.05	0.08	0.13

Note: μ, mean return; β, systematic risk (beta); $\boldsymbol{\sigma}$, total risk; IR, idiosyncratic risk; size, log of the average market cap; Σ_μ, semi-standard deviation with respect to the mean; Σ_0, semi-standard deviation with respect to zero; Σ_{Rf}, semi-standard deviation with respect to the risk-free rate; β^D, downside beta; *VaR*, value at risk; skew, skewness; kurt, kurtosis.

Table 6. Costs of Equity, Ranked by Correlations with World Returns.

Market	CE_{β}^{D}	CE_{β}	$CE_{\Sigma\mu}$	CE_{σ}	CE_{Skew}	CE_{VaR}
First tier markets						
United States	9.33	10.01	10.72	10.37	12.27	11.38
Germany	8.37	9.45	11.88	11.61	13.47	12.51
France	7.32	9.75	11.44	11.98	8.96	11.60
Sweden	10.01	10.94	13.41	13.68	9.62	14.08
United Kingdom	7.63	8.41	10.20	10.37	13.16	10.99
The Netherlands	7.54	9.34	12.17	11.98	11.27	12.43
Canada	9.73	10.01	12.80	12.86	20.87	14.07
Spain	7.75	8.97	11.66	12.08	4.99	12.64
Switzerland	8.14	8.22	10.90	11.58	6.39	11.63
Portugal	9.14	8.25	12.33	13.85	39.27	13.53
Hong Kong	6.85	10.19	16.58	16.34	20.82	18.14
Australia	6.09	6.97	10.15	10.54	12.36	11.21
Denmark	7.03	6.96	10.85	10.82	14.87	11.33
Mexico	10.67	10.95	17.94	18.28	9.36	19.41
South Africa	10.78	8.88	14.95	14.45	39.13	17.46
Second tier markets						
Singapore	6.28	9.00	15.76	16.82	13.39	18.26
Austria	8.53	6.81	11.13	21.55	10.70	12.43
Argentina	8.09	10.04	18.14	18.53	17.16	20.79
Israel	7.22	7.58	14.08	13.56	20.13	15.22
Brazil	12.04	10.10	22.75	21.43	29.82	25.84
Japan	5.48	7.75	13.45	14.74	8.13	15.25
Chile	5.03	8.00	12.78	13.22	14.85	15.20
Korea	7.68	11.83	26.28	26.29	26.65	30.05
New Zealand	6.00	6.75	14.04	14.42	8.67	15.26
Turkey	22.44	11.35	31.09	29.78	41.45	36.78
Czech Rep	7.88	6.50	13.66	14.04	6.42	15.18
Hungary	6.08	7.46	17.89	18.14	10.70	19.70
Greece	8.27	8.18	15.99	17.74	7.70	17.19
Thailand	9.49	9.88	21.82	24.04	12.42	25.42
Philippines	7.84	8.18	16.95	18.16	14.70	20.14
Third tier markets						
Malaysia	5.19	7.86	16.40	18.04	26.70	18.50
Venezuela	6.10	8.18	19.53	21.55	11.35	21.22
Indonesia	6.79	10.46	33.32	32.46	58.70	36.48
Peru	5.15	5.42	12.47	13.06	9.85	14.75
Estonia	4.59	7.04	23.63	23.52	41.85	29.41
Poland	10.40	5.30	17.44	17.85	15.85	19.41
India	6.48	6.26	15.22	15.98	4.79	15.61
Egypt	7.01	4.77	13.27	14.26	9.10	15.15
Namibia	4.81	4.84	13.77	15.01	23.27	17.14
Colombia	5.22	6.20	15.86	16.96	5.10	18.53

Table 6. (*Continued*)

Market	CE_{β}^{D}	CE_{β}	$CE_{\Sigma\mu}$	CE_{σ}	CE_{Skew}	CE_{VaR}
Taiwan	5.14	4.22	16.53	16.91	16.42	19.04
Botswana	5.02	3.90	8.98	9.99	16.53	9.35
Sri Lanka	3.57	3.80	11.01	10.73	17.27	12.84
Jordan	3.56	3.80	7.38	8.24	22.42	8.14
Lithuania	4.28	3.88	13.87	19.08	146.42	16.30
Zimbabwe	4.18	4.02	21.77	21.26	25.56	26.15
Latvia	8.45	3.98	18.01	20.24	6.53	21.81
Lebanon	5.51	3.68	10.71	11.68	20.79	12.14
Nigeria	5.57	3.67	10.81	11.93	17.39	12.38
Pakistan	3.62	5.18	18.22	18.23	15.62	21.05
Russia	12.47	3.67	29.30	28.76	17.07	34.00
Morocco	3.95	3.51	7.94	8.86	22.70	8.46
Mauritius	4.60	3.50	7.62	8.09	7.56	8.60
Slovakia	4.50	3.53	11.55	11.27	17.56	12.86
Ghana	4.21	3.32	11.42	12.55	24.13	13.80
Kenya	4.64	3.31	10.92	10.54	47.56	11.62
Slovenia	4.18	3.32	13.47	14.43	6.70	16.00
China	4.44	2.86	15.70	15.64	25.82	16.28
Tunisia	4.81	3.02	11.46	11.76	13.27	13.85

Note: The Cost of Equity calculations are based on Eqs. (5)–(10). Cost of Equity is based on a risk-free rate of 3.56 percent and a world market risk premium of 6 percent. All numbers are expressed as percentages.

3.2. Value at risk

$$CE_{VaR} = R_{\mathrm{f}} + (RP_{\mathrm{w}})(VaR_i/VaR_{\mathrm{w}}) \tag{8}$$

3.3. Downside beta

$$CE_{\beta}^{D} = R_{\mathrm{f}} + (RP_{\mathrm{w}})(ABS(\beta^{D})) \tag{9}$$

3.4. Skewness

$$CE_{Skewness} = R_{\mathrm{f}} + RP_{\mathrm{w}}(-(ABS(Skewness_i))/Skewness_{\mathrm{w}}) \tag{10}$$

where *CE* stands for the cost of equity for each risk measure. Note that Eq. (6) translates into the standard CAPM equation as β_{w} is 1.

Table 6 shows that the cost of equity estimates based on the downside beta represent the lowest expected returns of any of the cost of equity calculations while the estimates based on the value at risk tend to be at the other end of the spectrum. This already poses a practical problem. If the value at risk cost of equity is higher than the downside beta cost of equity, and developed markets are to use the former while frontier markets use the latter, this suggests that the cost of equity is always lower in third tier markets than in first tier markets. However, the same is true when using beta to calculate the cost of equity. Skewness measures appear to result in intuitively appropriate cost of equity estimates, at least for second tier markets. The semideviation seems to be the most intuitive for all market tiers.

7. CONCLUSIONS

Investors can face many risks in emerging markets – including inadequate regulatory systems, political instability, expropriation of assets or radical policy shifts – which are not considered in the basic theory surrounding the cost of equity. While none of the risk measures tested in this study can capture the risk premium demanded for the above qualitative risks, a risk measure that appropriately measures quantifiable risks as much as possible would give investors more certainty.

It does not appear appropriate to estimate the cost of equity based on one risk measure for all markets. A sub-sample of African countries demonstrates this succinctly in Table 7. In all measures except size, South Africa has either the highest or the second highest cost of equity compared with its African counterparts. This is despite a higher turnover, more listed shares, higher global integration and a more efficient market. It appears that it

Table 7. Cost of Equity Comparisons – African Countries Only.

Market	CE_{β}^{D}	CE_{β}	$CE_{\Sigma\mu}$	CE_{σ}	CE_{Skew}	CE_{VaR}
South Africa	10.78	8.88	14.95	14.45	39.13	17.46
Egypt	7.01	4.77	13.27	14.26	9.10	15.15
Zimbabwe	4.18	4.02	21.77	21.26	25.56	26.15
Morocco	3.95	3.51	7.94	8.86	22.70	8.46
Mauritius	4.60	3.50	7.62	8.09	7.56	8.60
Tunisia	4.81	3.02	11.46	11.76	13.27	13.85
Nigeria	5.57	3.67	10.81	11.93	17.39	12.38
Botswana	5.02	3.90	8.98	9.99	16.53	9.35
Kenya	4.64	3.31	10.92	10.54	47.56	11.62
Ghana	4.21	3.32	11.42	12.55	24.13	13.80
Namibia	4.81	4.84	13.77	15.01	23.27	17.14

Note: The Cost of Equity calculations are based on Eqs. (5)–(10). Cost of Equity is based on a risk-free rate of 3.56 percent and a world market risk premium of 6 percent. All numbers are expressed as percentages.

would be appropriate to use different risk measures for each market, depending on its level of integration with global markets.

What factor is the most important when determining which markets belong in different risk categories? The results suggest that ranking markets based on their correlation to world returns allows significant relationships between risk variables and mean returns to become apparent. Based on this rationale, the results suggest that using a value at risk or semideviation measure would be most appropriate for first tier markets, the skewness for second tier markets and the downside beta for third tier markets. The practical implication of the results, however, are not entirely conclusive as to which risk measure is appropriate for which market. The downside risk is appealing intuitively and does seem to be significant across all market tiers, particularly frontier markets. However, cost of equity estimates based on the downside beta are very low and appear to underestimate risk in frontier markets. Another form of downside risk, such as semideviation, would perhaps lead to more reasonable estimates.

Although this study does not offer clear alternatives regarding which risk measures should be used for which markets, it does appear that the results highlight the dangers of the widespread use of the CAPM across all markets. The low betas presented in some emerging markets result in very low cost of equity measures, providing a false signal of low risk in emerging markets. Uncertainty about the validity of these results results in the addition of arbitrarily high-risk premiums and steers investors away from these markets, which do in fact offer high rates of return as well as added diversification benefits. Beta, therefore, does not warrant being applied across the spectrum of markets.

Certainly this study is not and should not be the end of this debate. In order to provide greater certainty to foreign direct investors, a more accurate measure of cost of equity must be determined based on the development and level of integration of a market. Correlations with world returns is a very crude measure of integration. Two countries may be completely integrated even though their equity returns are uncorrelated. The low correlation might simply reflect the different industrial mixes in the two countries. A more accurate methodology that adjusts for differences in industry mixes might be used to more accurately determine the degree of integration of the countries in this sample. The result may be a more accurate ranking of markets and more conclusive results.

Another significant contribution would be to expand on the cross-sectional work done in this study by creating time series risk measures. Risk measures do change over time, and it would be important to capture the transformation of risk and not only a snapshot. Moreover, with time series, one could test each country individually to determine which risk measures best explain returns on a country by country basis. Time-varying data would allow analysis of each market in isolation and could yield more conclusive results.

Lastly, this study looks at aggregate local markets but not at individual shares. As institutional emerging market investors become more cyclical players, searching for liquidity, only the large and liquid shares of each market will be exposed to global fund flows. Therefore, some shares within each market may become integrated with global equity markets while other shares of the same market become more segmented. Each set of shares would then need to be assessed using different risk measures. More work could be done on determining the degrees of segmentation within markets and the appropriate cost of equity measures that should be used for different shares within the same market.

NOTES

1. Very small, less developed equity markets as defined by the IFC/S&P's EMDB.
2. Korajczyk (1996) investigates one measure of financial integration between equity markets. He uses a multifactor equilibrium arbitrage pricing theory. This measure of market segmentation tends to be much larger for emerging markets than for developed markets, which is consistent with larger barriers to capital flows into or out of emerging markets.

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