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Risk exposure and financial policy

An empirical analysis of emerging markets

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Abstract

Purpose – This paper aims to evaluate the effect of risk on the financial policy of emerging market firms.

Design/methodology/approach – Using data from 34 emerging markets during a 17-year period, 1990-2006, a panel data model is employed for the analysis.

Findings – The results of this study indicate that firms with high probability of survival are likely to employ more debt. The level of risk exposure, particularly business risk is important in influencing the financial decisions of firms in emerging market economies. It is argued that since the use of debt increases firms' exposure to financial risk, firms with high business risk would shy away from using more debt. Also, finance providers in the financial market may not be interested in lending to firms with high business risk. This study also identified profitability, dividend, asset tangibility, growth opportunities, and GDP per capita as important determinants of the financial policy of emerging market firms.

Originality/value – This study contributes to the extant literature by providing empirical evidence regarding the effect of risk on the financial policy of emerging market firms.

Keywords Risk management, Finance, Emerging markets

Paper type Research paper

1. Introduction

Important theories of capital structure include the pecking order theory and trade-off theory. In the pecking order theory, external financing is more expensive for riskier securities (possibly due to informational asymmetries between managers and security holders). Thus, firms prefer to finance first with internal funds, then with debt, and lastly with equity. In the trade-off theory, the benefits of increased leverage (for example, tax benefits or reductions in agency costs) are weighed against the costs of increased leverage (for example, deadweight bankruptcy costs) in order to determine the optimal amount of leverage (Korajczyk and Levy, 2003). Thus, the trade-off theory suggests a proportional relationship between financial leverage and economic performance (Andersen, 2005). With respect to the bankruptcy costs, bankruptcy probability increases with debt level since it increases the risk that the firm might not be able to generate profits to repay the interest and the loans. In other words, if there is the likelihood of bankruptcy and the expected associated costs of bankruptcy are significant, the firm with high leverage may not be as attractive to investors as the one with limited leverage (Van Horne, 2002).

JEL classification – G30, G32

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In fact, risk has been identified as an important factor in financial decisions. However, existing theoretical and empirical research does not provide an unambiguous answer to the question of whether an increase in a firm's business risk should lead it to lower the level of debt in its capital structure (Kale *et al.*, 1991). The extant literature suggests an inverse relationship between business risk and optimal debt level. According to Kale *et al.* (1991), the basis for this argument is that the existence of debt in the capital structure increases the probability of bankruptcy, and firms with more variable cash flows, that is, higher business risk, have a higher probability of bankruptcy for a given level of debt. The issue of risk and it effect on financing policy of firms is critical considering that the cost of capital and hence, the value of a firm, depends upon its debt-equity mix (Boyd and Smith, 1998; Hovakimian *et al.*, 2001).

Most studies on financial policy and capital structure have used data from American and European companies. However, research on the determinants of capital structure of emerging and developing market firms has emerged as an extended new line of research because of the differences in levels of efficiency and institutional arrangements between developed markets and emerging markets (Eldomiaty, 2007). This paper contributes to the existing literature by providing empirical evidence regarding the effect of risk on the financial policy of emerging market firms. We believe our understanding of this subject would be enhanced by examining the effect of risk exposure on financing decisions from the perspective of emerging market economies. Using data for 34 emerging markets for a 17-year period, 1990-2006, we adopt a panel framework in addressing this issue. The main findings of this paper are that a high probability of survival is associated with high debt use. Firms that exhibit higher probabilities of survival are likely to accommodate more risk in the form of financial risk that comes with the use of debt finance. The paper clearly provides empirical support for the proposition that lower business risk is associated with higher debt use after controlling for profitability, asset tangibility and future growth.

The remainder of this paper is structured as follows: Section two discusses some theoretical issues on capital structure and reviews the existing empirical literature on the effect of risk on capital structure. Section three explains the data used and the econometric method employed for the analysis. Section four discusses the estimation results of the study. Section five concludes with a summary of the key findings of the study.

2. Overview of literature

In the Modigliani and Miller (1963) framework, the value of the firm is said to be independent of its capital structure under conditions of perfect capital markets, no taxes, no transaction costs, and information symmetry. In the Modigliani and Miller (1963) framework there are also no bankruptcy costs. In case a firm is unable to meet its contractual obligations, it is costlessly transferred to its bondholders. Subsequently, Modigliani and Miller (1963) revised their earlier position by easing the conditions and showed that under capital market imperfection where interest expenses are tax deductible, firm value will increase with higher financial leverage. In this situation, the optimal capital structure is determined by a trade-off between increased bankruptcy risk from higher debt use and the tax advantage associated with debt. Also, in the real world, bankruptcy imposes both direct and indirect costs on the firm. If firms increase their debt position as a result of the tax benefit, then their ability to meet their fixed interest payment obligation reduces. Such a situation increases the probability (risk) of

bankruptcy and consequently the cost of financing. In the view of Agarwal and Mohtadi (2004), firms that adjust their capital structure away from excessive debt reduce the risk of exposure to debt-equity mix and therefore are able to reduce their cost of finance.

Bankruptcy costs are the costs incurred when the perceived probability that the firm will default on financing is greater than zero. Direct bankruptcy costs include legal expenses, trustees' fees, and other administrative costs in the bankruptcy process. Haugen and Senbet (1978) explain that bankruptcy costs must be trivial or nonexistent if one assumes that capital market prices are competitively determined by rational investors. Indirect bankruptcy costs include disruption of operations, loss of suppliers and market share, and the imposition of financial constraints by creditors. Indirect bankruptcy costs involve the loss in profits incurred by the firm as a result of the unwillingness of stakeholders to do business with them. Customer dependency on a firm's goods and services and the high probability of bankruptcy affect the solvency of firms (Titman, 1984). If a business is perceived to be close to bankruptcy, customers may be less willing to buy its goods and services due to the risk of the firm not being able to meet its warranty obligations. Also, employees might be less inclined to work for the business or suppliers less likely to extend trade credit. These indirect costs of bankruptcy (and the financial distress costs that may occur even if the firm does not enter bankruptcy) can be very significant[1]. The effect of bankruptcy costs on company value is easily seen in the case of direct bankruptcy costs. When a company issues risky debt there is some probability that the company will default, in which case direct bankruptcy costs will be incurred. Therefore, by issuing risky debt, a company gives outsiders (liquidators and other insolvency specialists) a potential claim against its assets, which must decrease the value of the company to its shareholders and/or its debt holders (Peirson *et al.*, 1990).

These bankruptcy/financial distress costs carry a number of implications for capital structure choice. In the first place, optimal debt levels may be inversely related to measures of financial risk, for instance, cash flow volatility. Second, optimal leverage ratios may be positively related to firm size. If bankruptcy costs include a fixed component, these costs constitute a larger fraction of the value of a firm as firm size decreases[2]. Last, leverage may be positively related to the value of a firm's collateralizable assets or liquidation values (Gertler and Gilchrist, 1994). Higher liquidation values reduce the expected losses accruing to debt holders in the event of financial distress, thus making debt less expensive (Yartey, 2006).

All these behaviours by the stakeholders effectively reduce the value of the firm. Therefore, firms which have high distress cost would have incentives to decrease outside financing so as to lower these costs. Warner (1977) maintains that such bankruptcy costs increase with debt, thus reducing the value of the firm. According to Modigliani and Miller (1963), it is optimal for a firm to be financed by debt in order to benefit from the tax deductibility of debt. The value of the firm can be increased by the use of debt since interest payments can be deducted from taxable corporate income. However, increasing debt results in an increased probability of bankruptcy. Hence, the optimal capital structure represents a level of leverage that balances bankruptcy costs and benefits of debt finance. The greater the probability of bankruptcy a firm faces as a result of increases in the cost of debt, the less debt they use in the issuance of new capital (Pettit and Singer, 1985).

Firm risk can be looked at in terms of business risk and financial risk (Ward, 1993). Business risk is associated with the adverse effects of environmental uncertainties on the earnings development of corporate business activities, whereas financial risk is the risk associated with promises and requirements resulting from the use of more debt finance. Increase in business risk and financial risk may result in an increased probability of bankruptcy, but at any given level of business risk, the probability of bankruptcy will be positively related to the company's financial risk (Peirson *et al.*, 1990). Therefore, firms that operate in environments with a high level of business risk should reduce their financial risk by decreasing their debt levels. They may have to employ more capital reserves as a financial buffer to cope with the uncertainties in the business environment. Conversely, higher debt use is better suited in the case of relatively stable business activities where the need for a financial buffer is correspondingly lower. This indicates that high business risk is associated with low debt and for that matter low financial risk (Andersen, 2005).

The empirical literature indicates that the level of risk is an important determinant of a firm's capital structure (Kale *et al.*, 1991). The tax shelter-bankruptcy cost theory of capital structure determines a firm's optimal leverage as a function of business risk (Castanias, 1983). Given agency and bankruptcy costs, there are incentives for the firm not to fully utilise the tax benefits of 100 per cent debt within the static framework model. The more likely a firm is exposed to such costs, the greater their incentive to reduce their level of debt within its capital structure. Firms with high operating risk experience very volatile cash flows and are more likely to default on their debt commitments (Johnson, 1997). According to Kim and Sorensen (1986), firms with high degree of business risk have less capacity to sustain financial risks and thus, employ less debt in their capital structure. Similarly, rather than the firm attempting to reduce leverage when faced with increased business risk, the market might also impose a reduction by its unwillingness to lend to the firm[3]. Following from these explanations, it is obvious that firms with high risk tend to use less debt finance. Some previous studies have also supported the inverse relationship between risk and leverage (see Bradley *et al.*, 1984; Titman and Wessels, 1988; Friend and Lang, 1988; MacKie-Mason, 1990; Kale *et al.*, 1991; Kim *et al.*, 1998; Abor and Biekpe, 2005). However, other empirical studies suggest a positive relationship between risk and debt ratio (Jordan *et al.*, 1998; Michaelas *et al.*, 1999).

It is necessary to also look at the pecking order theory in explaining financial policy of firms. The pecking order theory suggests that, firms follow a certain hierarchical order in their financing decisions. It is argued that due to information asymmetries between insiders and outsiders, firms will initially rely on internally generated funds to finance new projects. They will then turn to debt if additional funds are needed and then finally to equity. The pecking order theory explains why the bulk of external financing comes from debt. It also explains why more profitable firms borrow less: not because their target debt ratio is low-in the pecking order they do not have a target-but because profitable firms have more internal financing available. Less profitable firms require external financing, and consequently accumulate debt (Myers, 1984; Myers and Majluf, 1984; Myers, 2001).

The implications of the pecking order theory are that:

(1) Firms prefer internal to external finance (Information asymmetries are assumed relevant only for external financing).

(2) Dividends are "sticky," so that dividend cuts are not used to finance capital expenditure, and so changes in cash requirements are not soaked up in

short-run dividend changes. In other words, changes in net cash show up as changes in external financing.

(3) If external funds are required for capital investment, firms will issue the safest security first, that is, debt before equity. If internally generated cash flow exceeds capital investment, the surplus is used to pay down debt rather than repurchasing and retiring equity. As the requirement for external financing increases, the firm will work down the pecking order, from safe to riskier debt, perhaps to convertible securities or preferred stock, and finally to equity as a last resort.

(4) Each firm's debt ratio therefore reflects its cumulative requirement for external financing (Myers, 2001).

It is worth noting that much of the research on capital structure decisions have been limited to developed markets. But given the significant differences in levels of efficiency and institutional arrangements between developed markets and emerging markets (Eldomiaty, 2007), it is necessary for further studies to focus on emerging markets. Glen and Singh (2004), for instance, have shown that emerging market firms have lower levels of leverage (which has even declined in recent years) than do their developed market counterparts. Interestingly, recent research by Jong *et al.* (2008) show that, contrary to implicit assumptions in prior studies, firm-specific determinants of leverage differ across countries and are also impacted by country-specific factors.

A few previous studies have involved the determinants of capital structure in specific emerging economies. These include Pandey and Chotigeat (2004), which examined the financial characteristics of Malaysian companies and their debt policies. Their results show that all types of debt (short-term, long-term, and total) are influenced by profitability, size, and tangibility-but not by growth, risk and investment opportunity, the latter being contrary to evidence from developed markets. Benkato *et al.* (2005) also found that in the emerging market of Egypt, non-debt tax shield is a primary determinant of long-term leverage, while the unlevered tax rate is the key factor explaining short-term leverage. Other conventional determinants of capital structure like market-to-book value ratio and capital gains (losses) from changes in the firms' stock prices fail to produce any significant explanatory power for leverage.

Nishat and Ullah (2008) found that, in Pakistan, firms with high risk and more tangible assets use less debt, and that the size of the firm and growth opportunities are positively related to the debt ratio, while more profitable and highly liquid firms avoid debt and rely mainly on equity financing. In his study of the Chinese market, Chen (2004) posit that neither the trade-off model nor the pecking order hypothesis derived from Western settings provides convincing explanations for the capital structure choices of Chinese firms. The capital structure decision of Chinese firms seems to follow a "new pecking order" – retained profit, equity, and long-term debt. Similarly, Delcoure (2007) suggests that neither the trade-off, pecking order, nor agency costs theories explain the capital structure choices of Central and Eastern European markets. Companies do follow the modified "pecking order". On the other hand, Fan and So (2004) found the pecking order principle to be preferred to maintaining a target financing mix by Hong Kong managers. Apparently, the Asian financial crisis led managers to prefer equity to debt. Managers did not follow a set of principles mechanically in making financing decisions, but also considered the current market conditions.

3. Methodology

3.1 The model

This paper investigates how risk exposure affects financial policy of firms in emerging market economies. Based on the corporate finance theories discussed and on the basis of previous empirical studies, we specify the following static panel model of financial policy:

$$Y_{it} = \alpha_i + \delta \mathrm{RISK}_{it} + \beta X_{it} + \mu_{it} \quad (1)$$

where subscript i and t represent the country and time, respectively. Y is a measure of financial policy. RISK are measures of risk variables including, the Altman (1968) Z-Score, the Ohlson (1980) O-Score and inflation. The Z-Score captures the probability of survival (one year ahead) and is defined as: 1.2 (working capital/total assets) + 1.4 (retained earnings/total assets) + 3.3 (earnings before interest and tax/total assets) + 0.6 (market value of equity/total liabilities) + 0.999 (sales/total assets). The O-Score also measures the one-year-ahead probability of default and is defined as: − 1.32 − 0.41 (Size) +6.03 (total liabilities/total assets) − 1.43 (working capital/total assets) + 0.08 (current liabilities/total assets) − 2.37 (net income/total assets) − 1.83 (pre-tax income plus depreciation and amortization/ total liabilities) + 0.285F − 1.72G − 0.52H, where Size is the natural log of total asset divided by the GDP deflator; F is an indicator variable equal to one if cumulative net income over the previous two years is negative, and zero otherwise; G is an indicator variable equal to one if owners' equity is negative and zero otherwise; and H is the scaled change in net income.

Inflation is used as a proxy for systematic risk. Inflation increases the real financing cost and therefore may be associated with the use of less debt and external finance. X represent the control variables and include profitability (return on assets), dividend (ratio of dividend to capital), asset tangibility (proportion of fixed assets in total assets), growth (market-to-book value ratio), and macro income level (log of GDP per capita). μ is the error term. Three measures of financial policy are used in this analysis. These are financial leverage (the debt-equity ratio), external finance (external finance to total finance ratio), and debt maturity (the ratio of short-term debt to total debt). Using this model, it is possible to investigate the effect of risk on financial policy.

3.2 Data overview and variables description

This study relies on accounting and market data of publicly traded companies in 34 emerging markets over the period 1990-2006. The countries are made up of; Argentina, Brazil, Chile, China, Columbia, Czech, Egypt, Greece, Hong Kong, Hungary, India, Indonesia, Israel, South Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Portugal, Russian Federation, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Taiwan, Thailand, Turkey, Venezuela and Zimbabwe. This information is obtained through the Corporate Vulnerability Utility of the International Monetary Fund. The Corporate Vulnerability Utility provides indicators for surveillance of the corporate sector and it relies on accounting data from Worldscope and market data mainly from Datastream.

We control for some variables that have been documented in the literature to influence corporate financial policies. Following from standard corporate finance theory, we control for asset tangibility, growth and macro income level. In order to motivate the expected signs of the determinants of financing decisions, we draw upon our review of the extant literature. The control variables are discussed as follows.

Requirement for debt financing. Two variables are used as proxies for the firm's requirement for debt financing. These are return on assets (profitability) and the ratio of dividends to capital (dividends). Profitability is included because several studies (see Titman and Wessels, 1988; Barton *et al.*, 1989; UgÏurlu, 2000), have found an inverse relationship between profitability and leverage. In the context of the pecking order theory, profitable firms are able to generate enough internal finance and therefore will depend less on external sources of finance. Also, within the agency theory framework, if the market for corporate control is inefficient, managers of profitable firms will use more retained earnings in order to avoid the disciplinary role of external finance. These explanations point to a negative relationship between profitability and leverage. However, it is also possible that as a firm's profitability increases, the firm becomes the target of lenders, who tend to prefer borrowers with high current cash flows. Furthermore, in agency theory framework, if the market for corporate control is efficient, managers of profitable firms will seek debt because they regard it as a commitment to pay out cash in the future as in the context of Jensen (1986). These explanations also support a positive relationship between profitability and leverage (Yartey, 2006). The ratio of dividends to total capital is included because cash constrained firms are unlikely to pay out large dividends. According to Korajczyk and Levy (2003), a firm is financially constrained if it is unable to pay dividends.

Asset tangibility. Asset tangibility is defined as the proportion of fixed assets in total assets. The corporate finance theory prescribes that a firm's optimal financing mix will depend on the owner's ability to engage in opportunistic behaviour at the expense of creditors and other parties. This, in turn, will depend partly on the composition of the firm's assets. Firms with high ratios of fixed assets to total assets are predicted to have high long-term debt. The trade-off theory predicts a positive relationship between tangibility and debt levels. In particular, tangible assets often reduce the costs of financial distress because they tend to have higher liquidation value. For this reason tangible assets normally provide high collateral value relative to intangible assets, which implies that these assets can support more debt. It is usually more difficult to alter the variance of the cash flows generated from tangible rather than intangible assets. Thus, asset tangibility reduces the scope for risk shifting and consistent with agency theory, firms with tangible assets will support more debt (Yartey, 2006; Abor and Biekpe, 2009). However, Titman and Wessels (1988) provide an agency theory based argument for a negative relationship between the tangibility of the firm's assets and leverage. They argue that it is easier to monitor the use of tangible rather than intangible assets, which means that firms with intangible assets will tend to use more debt for monitoring purposes (Yartey, 2006).

Firm growth. Growth is defined in terms of market-to-book value ratio. In line with pecking order theory, growing firms that need funds prefer debt to external equity. Firms with high growth opportunities will require more external debt finance in order to finance the growth, thus, the relationship between growth opportunities and leverage is predicted to be positive. However, the agency cost theory postulates that rapidly growing firms are not able to use their growth potential as collateral asset with which loans can be secured. In line with agency theory of debt, conflicts between owners and lenders should lead to a negative relationship between growth and debt levels. These conflicts include two of the agency costs of debt, namely under investment and risk shifting. Considerations based on the trade-off theory also point to

a negative correlation between growth and leverage (Yartey, 2006). For example, although growth opportunities add value, the firm cannot use growth opportunities as security for lenders (Titman and Wessels, 1988). Myers (1977) supports the position that firms with growth opportunities will employ less debt because the conflicts of interest between debt and equity holders are especially serious for assets that give the firm the option to undertake such growth opportunities in the future.

3.3 Panel data estimation

This study adopts a panel data method given that it allows for a broader set of data points. Therefore degrees of freedom are increased, collinearity among the explanatory variables is reduced and the efficiency of economic estimates is improved. Also, panel data can control for individual heterogeneity due to hidden factors, which, if neglected in time-series or cross section estimations leads to biased results (Baltagi, 2005). The panel regression equation differs from a regular time-series or cross-section regression by the double subscript attached to each variable. The general form of the model can be written as:

$$y_{it} = \alpha + X'_{it}\beta + \mu_{it}\, i = 1, ..., N; t = 1, ..., T \tag{2}$$

where α is a scalar, β is K X 1 andX_{it} is the itth observation on K explanatory variables.

We assume that the μ_{it} follow a one-way error component model.

$$\mu_{it} = \mu_i + \nu_{it} \tag{3}$$

where μ_i is time-invariant and accounts for any unobservable individual-specific effect that is not included in the regression model. The term ν_{it} represents the remaining disturbance, and varies with the individual countries and time. It can be thought of as the usual disturbance in the regression. In estimating our model, we specify μ_i to be fixed for each cross-section over the analysis period. An obvious way to account for the fixed effects of those omitted variables that are specific to each cross-section but stay constant over time is to introduce dummy variables into the regression model. Hence, the fixed-effects model is also referred to as the least squares dummy variable model. It provides a common set of partial regression coefficients whilst allowing a different intercept for each of the cross-sectional units. Ooi (1999) explains that an alternative specification is to assume that the joint effects of the omitted (unobserved) variables can be appropriately summarized by a random variable. Panel data model with such error structure specification is called the random effects model. As both specifications can produce results that are significantly different from each other, the issue of whether to specify the effects as fixed or random has been widely treated in the econometric literature (see Balestra, 1992). The least squares dummy variable model may be specified as:

$$y_{it} = \alpha_i + X'_{it}\beta + \nu_{it} \tag{4}$$

4. Empirical results

4.1 Descriptive statistics

The descriptive panel summary statistics are presented in Table I. The mean of financial leverage measured by the debt to equity ratio is shown as 1.17. External finance registers

Variable	Mean	Std dev.	Min.	Max.
Financial leverage				
overall	1.17	127.58	0.00	12.99
between		64.98	0.29	3.18
within		109.33	−1.40	11.72
External finance				
overall	−0.01	5.27	−0.24	0.79
between		1.82	−0.04	0.04
within		4.97	−0.25	0.73
Debt maturity				
overall	0.58	11.83	0.22	1.00
between		9.68	0.36	0.80
within		7.08	0.34	0.98
Business risk				
overall	15.44	8.88	0.00	77.69
between		5.25	3.35	26.50
within		7.27	−3.72	67.91
Default risk				
overall	−3.37	4.60	−58.81	61.89
between		1.75	−6.98	1.14
within		4.24	−56.07	57.38
Inflation				
overall	0.0261	0.2169	−0.0016	4.5060
between		0.0637	0.0001	0.3244
within		0.2074	−0.2983	4.2077
Profitability				
overall	6.66	5.37	−17.79	51.90
between		3.31	2.02	18.30
within		4.31	−13.83	40.26
Dividend				
overall	0.32	0.49	0.00	3.93
between		0.27	0.02	1.15
within		0.42	−0.69	3.43
Tangibility				
overall	0.56	9.98	0.30	0.82
between		8.80	0.41	0.77
within		4.77	0.39	0.92
Growth				
overall	2.90	7.32	0.13	126.9
between		1.78	0.59	10.49
within		7.10	−7.18	119.3
GDP per capita				
overall	8.04	1.09	5.74	10.21
between		1.10	5.99	10.03
within		0.13	7.40	8.62

Table I.
Descriptive summary statistics

a mean of −0.01 over the period with an overall variation of 5.27. The mean debt maturity is also shown as 0.58, indicating that short-term debt represents 58 per cent of total debt finance. Measures of business risk and default risk register mean values of 15.44 and −3.37 respectively. The level of inflation and profitability are also shown as 2.61 per cent and 6.66 per cent respectively. On average 32 per cent of profits of emerging market firms are distributed as dividends to shareholders. Asset tangibility has a mean of 0.56 indicating that, on average, tangible fixed assets account for 56 per cent of total assets. The mean market to book value as a measure of growth opportunities is 2.9 and mean GDP per capita in emerging market economies over the period is 8.04.

4.2 Correlation analysis

In order to test for possible degree of multi-collinearity among the regressors, we include a correlation matrix of all the variables in Table II. Financial leverage shows significantly negative correlations with profitability and asset tangibility but a positive and significant relationship with business risk and default risk. External finance exhibits a significantly negative correlation with GDP per capita, but shows significantly positive correlations with inflation and profitability. Debt maturity registers a positive correlation with dividend but shows inverse correlations with business risk, asset tangibility and GDP per capita. Business risk shows significant and positive correlations with default risk, inflation, and asset tangibility, but negative correlation with profitability and dividend. There are significant and negative correlations between default risk and profitability as well as asset tangibility. However, we found a positive correlation between default risk and GDP per capita. Inflation shows significantly positive correlations with profitability, asset tangibility, and growth. Profitability is positively correlated with dividends but inversely related to asset tangibility and GDP per capita. Dividend payout also shows a negative correlation with asset tangibility but positively correlated with GDP per capita. Overall, the magnitude of the correlation coefficients indicates that multi-collinearity is not a potential problem in the regression models.

4.3 Regression results

The panel regression results are reported in Tables III-IV. We estimate both fixed and random effects specifications. The Hausman specification test was also conducted to determine the appropriate specification. The Hausman specification tests show that the Random effects specification is appropriate for the financial leverage and debt maturity models, while the fixed effects specification is appropriate for the external finance model.

The results from Table III indicate a significantly positive relationship between business risk and financial leverage. In this paper, business risk is defined in terms of the Altman's (1968) Z-Score, which captures the probability of survival. Therefore, higher Z suggests higher probability of survival or lower business risk. The result on the effect of business risk shows that firms with high probability of survival or low business risk are likely to employ more debt because of the low cost of borrowing. In other words, firms with high business risk or low probability of survival would be discouraged from taking on more financial risk associated with debt use. The more likely the firm is exposed to high risk, the less likely the need for debt. It could be explained that firms that have risk may be experiencing low cash flow to service their debt. Also, in the financial market, finance providers may be unwilling to lend to such

Table II. Correlation matrix

	Financial leverage	External finance	Debt maturity	Business risk	Default risk	Inflation	Profitability	Dividend	Tangibility	Growth	GDP per capita
Financial leverage	1.0000										
External finance	−0.0659 (0.1560)	1.0000									
Debt maturity	−0.0027 (0.9521)	0.0687 (0.1394)	1.0000								
Business risk	0.4385 (0.0000)	−0.0316 (0.4967)	−0.1105 (0.0134)	1.0000							
Default risk	0.0949 (0.0399)	0.0202 (0.6635)	0.0070 (0.8802)	0.1369 (0.0030)	1.0000						
Inflation	−0.0262 (0.5861)	0.1020 (0.0425)	0.0457 (0.3426)	0.1165 (0.0156)	−0.0186 (0.7111)	1.0000					
Profitability	−0.2287 (0.0000)	0.0992 (0.0327)	0.0467 (0.2973)	−0.5073 (0.0000)	−0.1489 (0.0012)	0.0811 (0.0935)	1.0000				
Dividend	−0.0058 (0.9002)	−0.0157 (0.7355)	0.1467 (0.0015)	−0.1789 (0.0001)	−0.0272 (0.5582)	0.0665 (0.1843)	0.2024 (0.0000)	1.0000			
Tangibility	−0.1370 (0.0020)	−0.0547 (0.2393)	−0.2375 (0.0000)	0.2276 (0.0000)	−0.2186 (0.0000)	0.1487 (0.0019)	−0.1263 (0.0047)	−0.1740 (0.0002)	1.0000		
Growth	0.0344 (0.4401)	0.0219 (0.6373)	0.0058 (0.8962)	−0.0007 (0.9876)	0.0335 (0.4690)	0.4344 (0.0000)	0.0710 (0.1130)	0.0045 (0.9219)	0.0357 (0.4242)	1.0000	
GDP per capita	−0.0147 (0.7590)	−0.0988 (0.0490)	−0.1313 (0.0060)	−0.0353 (0.4642)	0.1225 (0.0142)	−0.0261 (0.5681)	−0.3385 (0.0000)	0.0973 (0.0514)	−0.0419 (0.3840)	−0.0245 (0.6086)	1.0000

Notes: *P*-values are in parentheses; financial leverage is the ratio of debt to equity; external finance is the ratio of external finance to total finance; debt maturity is the ratio of short-term debt to total debt; business risk is the *z*-score which captures the probability of survival; default risk is o-score which measures probability of default; inflation risk is the inflation rate of the GDP deflator; market; profitability is net profit as a percentage of total assets; dividend payout is the ratio of dividend to capital; tangibility is the proportion of fixed assets in total assets; market-to-book value is used as a proxy for growth opportunities; GDP per capita the log of GDP per capita

	Financial leverage (Random effects)	External finance (Fixed effects)	Debt maturity (Random effects)
Business risk	6.6695	−0.0352	0.0569
	(6.63)***	(−0.66)	(1.08)
Inflation risk	−77.8038	7.9669	5.5285
	(−0.64)	(1.33)	(0.92)
Profitability	−0.3057	−0.2422	−1.1938
	(−0.15)	(−2.24)**	(−1.84)*
Dividend	17.8418	−0.1835	0.7421
	(1.44)	(−0.30)	(1.19)
Tangibility	−2.2851	−0.2464	−0.2368
	(−2.33)***	(−3.27)***	(−3.54)***
Growth	4.8443	−0.0315	0.1098
	(3.08)***	(−0.41)	(1.43)
GDP per capita	−5.8985	−13.3872	−2.1259
	(-0.55)	(−5.49)***	(−1.74)*
Constant	176.72	123.94	88.27
	(1.56)	(6.13)***	(7.95)***
R-squared	0.2163	0.0095	0.1145
Wald chi^2 (7)	86.76		25.69
Prob > chi^2	0.0000		0.0008
F-statistic		6.40	
Prob > *F*		0.0000	
Hausman test, chi^2 (7)	9.19	53.10	7.76
	0.2395	0.0000	0.3545

Notes: All regressions include a constant; *T*-statistics and Z-statistics are in parentheses; ***, **, * mean significant at 1 per cent, 5 per cent and 10 per cent level of significance respectively; financial leverage is the ratio of debt to equity; external finance is the ratio of external finance to total finance; debt maturity is the ratio of short-term debt to total debt; business risk is the z-score which captures the probability of survival; default risk is o-score which measures probability of default; inflation risk is the inflation rate of the GDP deflator; profitability is net profit as a percentage of total assets; dividend payout is the ratio of dividend to capital; asset tangibility is the proportion of fixed assets in total assets; market-to-book value is used as a proxy for growth opportunities; GDP per capita is the log of GDP per capita

Table III.
Regression results: effect of business risk on financial policy

firms because of the likelihood of default. This finding seems to support the finding of Kim and Sorensen (1986) who observed that firms with high degree of business risk have less capacity to sustain financial risks and thus, use less debt. The result is also in line with the prediction of the trade-off models that high-risk companies have lower borrowing capacity, considering the associated lower cost of borrowing. The effect of business risk on external finance and debt maturity are not significant.

Consistent with the pecking order theory, the results show a statistically significant relation between profitability and external finance. The pecking order theory suggests that firms will initially rely on internally generated funds, where there is no existence of information asymmetry, and then they will turn to debt if additional funds are needed, and finally, they will issue equity to cover any remaining capital requirements. Clearly, profitable firms are capable of retaining sufficient internal funds for financing their operations and will therefore have less need for external finance. Also, the negative relationship between profitability and debt maturity suggests that profitable

	Financial leverage (Random effects)	External Finance (Fixed effects)	Debt maturity (Random effects)
Default risk	0.2220	0.0343	−0.0180
	(0.17)	(0.57)	(−0.30)
Inflation risk	−91.2035	7.7136	5.0408
	(−0.15)	(1.29)	(0.85)
Profitability	−9.1191	−0.1869	−0.2894
	(−5.44)***	(−2.26)***	(−3.62)***
Dividend	23.0396	−0.2212	0.9099
	(1.76)*	(−0.36)	(1.49)
Tangibility	−1.6099	−0.2410	−0.2281
	(−1.42)	(−3.16)***	(−3.25)***
Growth	3.7470	−0.0254	0.1051
	(2.28)**	(−0.34)	(1.40)
GDP per capita	−20.7936	−13.5913	−2.1461
	(−1.69)*	(−5.57)***	(−1.67)*
Constant	422.80	124.48	89.09
	(3.38)***	(6.14)***	(7.82)***
R-squared	0.0776	0.0092	0.1344
Wald chi^2 (7)	38.71		24.09
Prob > chi^2	0.0000		0.0011
F-statistic		6.38	
Prob > *F*		0.0000	
Hausman test, chi^2 (7)	6.32	37.35	3.36
	0.5032	0.0000	0.8499

Notes: All regressions include a constant; *T*-statistics and Z-statistics are in parentheses; ***, **, * mean significant at 1 per cent, 5 per cent and 10 per cent level of significance respectively; financial leverage is the ratio of debt to equity; external finance is the ratio of external finance to total finance; debt maturity is the ratio of short-term debt to total debt; business risk is the z-score which captures the probability of survival; default risk is o-score which measures probability of default; inflation risk is the inflation rate of the GDP deflator; profitability is net profit as a percentage of total assets; dividend payout is the ratio of dividend to capital; tangibility is the proportion of fixed assets in total assets; market-to-book value is used as a proxy for growth opportunities; GDP per capita is the log of GDP per capita

Table IV.
Regression results: effect of default risk on financial policy

firms would rely on less short-term debt finance. The effect of dividend is not significant in all the models. The results of this study support the trade-off and the pecking order theories. Emerging market firms seem to rely on internal finance, which tends to be less risky and less costly. However, they may be able to attract external debt finance by exhibiting low risk.

Asset tangibility signals inverse relationships with financial leverage, external finance and debt maturity. The result for the financial leverage model is consistent with the agency theory that it is easier to monitor the use of tangible assets rather than intangible assets, indicating that firms with intangible assets will depend on more debt finance for monitoring purposes. Also, firms with high proportion of fixed assets in their asset structure tend to depend on less external finance. The inverse relationship between asset tangibility and debt maturity is consistent with firms matching the duration of their assets and liabilities. This suggests that firms would finance their current assets with short-term debt and fixed assets with long-term debt.

The results show a significantly positive association between growth and only financial leverage, suggesting that firms with growth opportunities require more debt in order to finance such growth. This position results from the fact that financing growth puts a lot of pressure on the firm, pushing them to raise debt from the capital market. In line with pecking order theory, growing firms that need funds prefer debt to external equity. Michaelas *et al.* (1999) also support the argument that future growth is positively related to firms' financial leverage.

The significantly negative impact of GDP per capita on the ratio of external finance to total finance, suggests that firms in countries with higher income levels are more likely to refrain from external finance. Relatively developed economies with higher income levels may encourage reliance on internal finance. It may well mean that higher income level may translate into increased ability of firms to post higher profits and generate more internal finance. Therefore, we expect firms to employ more internal finance considering that it is a less expensive source of finance than external finance. This result seems to provide support for the evidence reported in Korajczyk and Levy (2003), in that firms in high growth economies are more likely to rely on internal finance. In the debt maturity model, GDP per capita is also negatively related to the ratio of short-term debt to total debt. This indicates that firms in relatively developed economies rely on less short-term debt and more long-term debt. Higher GDP per capita may be characterised with higher levels of development of financial markets and intermediation. This is likely to foster greater reliance on debt by firms. However, the effect on financial leverage is insignificant.

Table IV reports the regression results of the effect of default risk and inflation risk on the various measures of financial policy. The results did not register any significant relationship between default risk and financial policy. The default risk is defined in terms of the Ohlson's (1980) O-Score, which measures probability of default, meaning, a higher O denotes a higher default probability. Also, apart from dividend, all the other variables show similar results reported in Table III. The results show a positive relationship between dividend and financial leverage. This indicates that firms with high dividend payout ratio exhibit greater reliance on debt. However, this is significant at only 10 per cent significant level. Dividend is used as a measure of financial constraint. Generally, firms with low dividend to capital ratio tend to have cash constraints and therefore may have difficulty in fulfilling their debt obligations as and when they fall due. We expect that firms that are able to maintain higher dividend payments are more liquid and should be capable of attracting more debt finance.

5. Conclusions

This paper examined the effect of risk on the financial policy of emerging market firms, over the period, 1990-2006. The main value of this paper is in respect of the identification of business risk, default risk and inflation and how they influence firms' financing decisions. We observed that, firms with high probability of survival are likely to employ more debt, given the low cost of borrowing. It stands to reason that firms with high business risk or low probability of survival would be discouraged from accommodating more financial risk associated with debt use. Also, firms with high business risk may have cash flow problems and therefore may be unable to fulfil their debt obligations, thus affecting their ability to attract more debt. Clearly, this result provides support for previous empirical studies and the prediction of the trade-off

models that, companies exhibiting high risk would have lower borrowing capacity. On the supply side, we expect that, in the financial market, finance providers may be unwilling to lend to such firms because of the likelihood of default. Profitability, dividend, asset tangibility, growth opportunities, and GDP per capita were also identified as significant determinants of financial decisions in emerging markets. The results of this study generally have implications for proper risk management and how that affects financial policy of emerging market firms.

We conclude this paper by suggesting the need for further research on the effects of other measures of business, financial and market risks on financial policy. Future research could also focus on developments in financial markets and financial policy.

Notes

1. Altman (1984) finds that indirect costs average about 17.5 per cent of firm value one year prior to bankruptcy.
2. Large companies may also have lower risk through diversification, more stable cash flows and established operating and credit histories. These factors provide large firms with greater access to alternative sources of finance in times of financial distress. This may reduce the present value of expected bankruptcy costs for large firms, thus encouraging them to take on relatively high debt burdens.
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