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“What Effect has Bond Market Developments in Emerging Asia had on the Insurance of Corporate Bonds?“

What Matters for Corporate Bond Market Development in Asia? Firm Characteristics, Market Characteristics and Reputation.

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Abstract

This paper investigates bond market development in Asia by exploring the determinants of firms' decision to issue public debt in emerging Asian economies. Using a novel database covering the period 1995 to 2007, we use comparable micro level panel of eight countries - China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore and Thailand - to explore the influence of firms' characteristics and indicators of bond market depth on the decision to issue corporate bonds. Our paper demonstrates the influence of firm-specific characteristics on the decision to issue bonds, and the effect of market liquidity and local market size: both are small but significant. Surprisingly, co-ordinated policies by national governments to encourage bond market development have had little impact on probability of bond issuance at the firm level in Asia. What matters most is the reputation a firm acquires through previous issues and from not having rating downgrades, which give confidence to the firm and investors in new issues.

Key words: Bond Financing, Financial Indicators, Emerging Asian Markets
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1 Introduction

Asian countries have small bond markets. In June 2010, the eight Asian economies included in this study-China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore and Thailand - had corporate debt securities outstanding of $98.6 billion, while the corresponding figure for the US was $1359 billion, and for the world as a whole the figure was $3121 billion. Of these outstanding bonds only $9.43 billion were issued in the year to June 2010 (compared with £261 billion issued in the United States), which suggests Asian firms do not issue large volumes of bonds.[1] Even compared to countries in Latin America the scale of corporate bond issues is small, since firm in Latin American countries issued $38.6 billion corporate bonds in the year to June 2010. Asia is therefore unusual in this respect even among developing regions. But Asian firms are issuing many more bonds than they were a decade ago: the $9.43 billion of corporate bonds issued in the year to June 2010 compares favorably with the volume issued in the year to June 2000, which was $3.6 billion, about one third of the present figure. Figure 1 shows that Asian countries listed above have been steadily expanding their corporate bonds issues over the period 1995-2007; so although bond markets are small they are growing. If, as the data suggests, Asian bond markets are expanding, we ask what has driven the decision at the firm level to issue corporate bonds in Asian countries? Our study explores the extent to which firm-level characteristics, market size and liquidity, and policy initiatives have contributed to the development of Asian corporate bond markets.

The paper is relevant to two important literatures on corporate financial developments in Asia. First, it refers to the well documented fact that firms in Asian countries have greater dependence on bank finance than firms in Latin America (see Burger and Warnock (2006) and Eichengreen et al. (2006)). This literature considers why Asia does not have larger bond markets, focusing on macro explanations tied to size, volatility and liquidity of the markets as well as to institutional features such as accounting standards, law and order, bureaucracy and corruption (see Eichengreen and Luengnaruemitchai (2004)). There is a growing set of studies on the development of Latin American bond markets as summarized in Borensztein et al. (2008) and evidenced in Aguilar et al. (2008); Braun and Briones (2008) and Castellanos and Martinéz (2008) that consider the influence of firm-level characteristics.

Second, Asian bond markets may be small due to the predominance of small and medium sized enterprizes that rely on high levels of internal funds available to finance firm-level investment (Chow and Fung (1998); Chow and Fung (2000); Poncet et al. (2010); Hericourt and Poncet (2009)) and growth (Guariglia and Poncet (2008)); Guariglia et al. (2010)).

[1]Figures are taken from the BIS Statistical Annex, September 2010, Table 12C http://www.bis.org/publ/qtrpdf/r_qa1009.pdf#page=106

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Guariglia and Poncet (2008) and Guariglia et al. (2010) document that firms in the 31 Chinese provinces and Semi-Autonomous Regions, over the period 2000-2007, have high productivity and abundant cash flows, creating significant proportion of the funds required for investment and growth from sources internal to the firm. Cash flow to tangible assets ratio in China is 30% compared to a value of 11-17% in various European Union countries and 19% in the United States. Bond markets in Asia may be small because firms do not need extensive market finance to invest and grow if internal funds are sufficient. In these circumstances we could understand why firms issue relatively few corporate bonds. In our study we include measures of liquid assets as one determinant of the decision to issue bonds to establish whether access to liquid assets has a negative effect on the probability of bond issuance at the firm level as this literature suggests.

The importance of well developed financial markets is underlined by Hale (2007), who argues that the composition of credit between bonds and loans affects the cost of debt crises when they occur. Asia is potentially more prone to the adverse effects of foreign loan dependence due to the low level of corporate debt securities outstanding, which for emerging markets in general has been estimated to cause credit supply to fall by over 30 percent following an exchange rate depreciation of 10 percent (see Hale and Arteta (2009)). Asian countries have been aware of this weakness since 1997 and have sought to develop their financial markets. This paper explores the importance of the policy initiatives undertaken by the Asian governments to allow bond markets to develop in two waves since 2003. The ASEAN countries have co-ordinated the issue and trading of sovereign and quasi-sovereign bonds since 2003 by allowing the Asian Bond Fund to purchase dollar and local currency government bond issues via the Pan Asian Bond Index Fund (PAIF) and the Fund of Bond Funds (FoBF). They have also improved the infrastructure as part of a wider Asian Bond Market Initiative (ABMI) to create a more integrated regional market. As a result the sovereign bond market has grown since 2003 by almost 50%, and corporate bond market has expanded by 55%. This paper asks whether the policy initiatives undertaken influenced firms' decisions to issue corporate bonds.

Despite the interest of this topic, few studies have looked at the determinants of corporate bond issuance in Asia. Chinn and Ito (2006) explain financial development of banking and equity markets – in terms of the size, value and liquidity – for 108 developed and emerging countries, using indicators of capital market openness, legal, institutional and accounting improvements to explain how these markets have developed. Eichengreen et al. (2006) uses aggregate data on bond market capitalization to GDP as a function of a similar set of variables to Chinn and Ito (2006) to examine the underdevelopment of Asian bond markets relative to Latin American bond markets, but it does not take into account firm

characteristics. Studies in Borensztein et al. (2008); Aguilar et al. (2008); Braun and Briones (2008) and Castellanos and Martinéz (2008) focus on Latin American firm-level data to explore the determinants of bond market participation at the firm level, but they do not extend their study to Asia. None of the studies that we are aware of considers the impact of the Asian bond market initiatives at the corporate level. Therefore our contribution to the literature is fivefold.

First, we construct a large firm-level regional panel of data for eight Asian countries – China, Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand – over the period 1995-2007 comprising 41921 annual observations on 4661 firms, of which 553 were corporate bond issuers, to explore the influences on the decision to issue bonds at the firm level.

Second, we consider the influence of firm-specific characteristics driving the decision to issue bonds. Our choice of variables reflects the factors that have been found to influence bond issuance at the firm level in developed countries (see Pagano et al. (1998), Datta et al. (2000) and Hale and Santos (2008)) as well as in emerging Latin American markets (see Aguilar et al. (2008); Braun and Briones (2008) and Castellanos and Martinéz (2008)) and they measure the ability of firms to overcome hurdles of issuing by convincing investors, underwriters and rating agencies that their bond issues are viable. We include firm growth in sales as a gauge of the need for finance, profitability as an indicator of creditworthiness, leverage as a measure of indebtedness and borrowing capacity of the firm, age to capture the ability of the firm to forge relationships with external financiers, and collateral indicating the assets that firms have to pledge against loans or other debts. Our results show that firm-level effects have a small but significant effect on the probability that a firm will issue a bond. We also test the hypothesis that the proportion of liquid assets available to the firm has an influence on the decision to issue bonds and confirm that firms with greater liquidity tend to issue fewer bonds, supporting the findings of Guariglia and Poncet (2008) and Guariglia et al. (2010)) for Chinese firms.

Third we consider market factors also influence the firm's decision to issue bonds by improving the market environment in which the firm issues. This is the focus of Eichengreen et al. (2006) in his comparison of Asian and Latin American Markets. We refer to market size and turnover as measures of market development following Chinn and Ito (2006) since larger markets with greater liquidity are more likely to encourage firms to issue bonds. These have direct effects on the probability of bond issuance since they affect costs of entering and exiting the market for firms and investors, and they reduce uncertainty and thresholds for entry. Larger and more liquid bond markets reduce uncertainty for investors by revealing more accurately the firm's financial condition in market prices and reduce the thresholds

for entry by allowing the development of local underwriting and rating agencies to facilitate lower cost bond issuance for the issuer. There is also an indirect effect from market factors to firm-specific factors because in a world with imperfect information these influences do not necessarily affect all firms equally, but vary with the characteristics of the firm. Therefore we allow for the fact that firms of different sizes, with varying levels of profits, liquidity, debt and collateral might respond to the growth of the market size and liquidity disproportionately. There is evidence in our results that market size and liquidity have a small direct and indirect effects on the probability of issuance.

Fourth, we consider the impact of the Asian Bond Fund (ABF) and the Asian Bond Market Initiative (ABMI). Eichengreen et al. (2006) and Burger and Warnock (2006) have argued that market scale was a significant impediment to the development of the corporate bond markets in emerging economies. If this is so then the regional initiative would be an important step towards deepening the market, and we can be quite precise about the timing of these initiatives, since starting in June 2003 eight east Asian countries purchased dollar denominated bonds issued by Asian governments through the Asian Bond Fund (ABF1), and in June 2005 they launched a new fund to purchase local currency bonds from Asian countries (ABF2). We explore how much influence the initiatives have had before and after 2003. When we split the sample into pre-ABMI and ABMI periods, we find that there is little evidence of any effect of the ABMI on firm's decisions to issue bonds.

Fifth, none of the possible explanations above goes very far towards explaining the decision of firms to issue bonds. Individually the most promising variables explain less than 10% of the probability of bond issuance by firms, and in many cases they explain much less. Market development and policy initiatives explain less than 1% of the probability that firms will issue a bond. We find, however, that certain variables relating to bond market participation and performance matter a great deal. A firm that has previously issued bonds, and one that has not experienced a ratings downgrade, is much more likely to issue a bond. The connection between these variables is reputation in the bond market. A previous issuer is a known quantity compared to one that has not previously issued. These firms may benefit from a track record. Firms that have not been downgraded have proven that they will not underperform. We find that this kind of reputation is important to a firm issuing bonds, just as Hale and Santos (2008) have found that other forms of reputation influence the timing of bond issuance in developed countries.

The rest of the paper is organized as follows. Section 2 discusses the state of Asian bond markets over the last decade. Section 3 presents the empirical methodology. In Section 4 we describe our data. Section 5 reports our results and Section 6 presents the robustness of our findings. Section 7 concludes the paper.

2 Asian Bond Markets

The Asian region has long recognized that it has relatively small bond markets. Both sovereign and corporate bonds outstanding are small as a percentage of GDP in relation to loans and equities in Hong Kong, Indonesia, Malaysia, Philippines, Singapore and Thailand; only Japan and Korea are exceptions in this regard, but even here the scale of the bond markets is closer to European than US levels as a percentage of GDP. Figures reported in Eichengreen and Luengnaruemitchai (2004) suggest that by comparison with other emerging markets notably in Latin America, the scale of bond markets in relation to broad money or domestic credit is small, which reflects the great dependence of Asian economies on bank finance (see Eichengreen et al. (2006)).

The vulnerability of corporations to small underdeveloped bond markets was underlined with the onset of the Asian crisis. Most corporations were heavily dependent on bank finance in domestic and foreign currency to supplement internal cash flow for investment, with smaller and medium sized enterprizes almost exclusively reliant on *domestic* bank loans. Domestic banks in turn depended on short-term dollar denominated funds to finance these domestic currency loans creating a potential currency mismatch between assets and liabilities on their balance sheets. When the crisis occurred the funding to banks and then to corporates fell dramatically, and in the absence of local bond markets to provide a "spare tire" for firms c.f. Borensztein et al. (2008), the real effects of the crisis were amplified.[2]

In the post-crisis period, building deep and liquid regional bond markets has became a priority to provide the means to free Asian economies from excessive dependence on bank intermediation and to foster the development of a more diversified and efficient financial sector, and there is evidence that they are growing (see Fernandez and Klassen (2004) and Gyntelberg et al. (2005)). But the level of bond market capitalization is low and results from the fact that bond markets are separated by country, with low liquidity, limited investor participation, underdeveloped infrastructure and few intermediaries. They are unable to create the critical mass required for adequate liquidity, which is widely regarded as between \$100-200bn (see McCauley and Remolona (2004) and Eichengreen et al. (2006)), since all emerging Asian countries excepting Korea, and more recently China and India, have failed to reach this level. Until a market reaches this critical size, trading volumes remain low, bid-ask spreads will be wider than comparable markets elsewhere (if not constrained by market regulations as many are in Asia) and both issuers and investors will remain few in number.

[2]The most severe experiences were in those countries with the most highly leveraged companies prior to the crisis – Korea, Thailand and Indonesia. Much of the corporate debt was foreign currency denominated therefore the reversal of capital inflows with the subsequent depreciation of the exchange rate had a sharp adverse effect on investment and output.

Regional governments are aware of this and have taken large strides to improve the bond markets at the country and regional level. Governments have issued increasing numbers of sovereign or quasi-sovereign bonds to establish a yield curve off which corporate bonds can be priced. The range of institutional investors has increased, the infrastructure has improved to ensure prices and volumes are recorded more quickly, and ratings agencies are beginning to provide information on bond issues. The regional initiative to establish an Asian Bond Fund to purchase dollar and local currency government bond issues through the Pan Asian Bond Index Fund (PAIF) and the Fund of Bond Funds (FoBF) has resulted in a deeper sovereign bond market and the Asian Bond Market Initiative proposal brought by the ASEAN+3 Finance Ministers has spurred a number of moves to create a more integrated regional market.

It is widely recognized that greater securitization in the sovereign bond market provides a yield curve off which the corporate issues can be priced (Hirose et al. (2004)) and encourages fixed income dealers to establish themselves in the markets, which they might not otherwise do (Harwood (2000)). According to Lejot et al. (2008) it is reasonable to suggest that bond market depth even if it is largely confined to the public sector debt market could be a spur to corporate bond issues.

Hirose et al. (2004) indicate that the scale of government issues of bonds has increased over time with issues being made on a scheduled basis, which has helped to establish a benchmark yield curve off which other bond issues can be priced. In addition, the range of investors encouraged to participate in bond markets has widened to include institutional investors such as private pension funds, insurance companies, investment trusts and this has been aided by lowering the bureaucratic hurdles involved with registration and participation.[3] Besides institutional investors, governments have encouraged foreign investor participation by liberalizing the domestic financial markets allowing foreigners to invest by reducing exposure to withholding taxes on returns or reporting requirements when purchasing or selling assets, although the level of participation is very low, as documented by Burger and Warnock (2007). In some markets foreign entities have been encouraged to issue bonds themselves. Asian authorities have sought to increase participation in the markets further by improving the infrastructure for market participants by improving the settlement process to enhance the immediacy and transparency of the trading process.[4] The engagement of international

[3]Previously, the main institutional investors had been local banks and government pension funds, which were buy-to-hold investors that did not enhance turnover in these markets. The lack of diversity among these investors tended to mean markets were dominated by participants on one side of the market i.e. buyers or sellers.

[4]The move to paperless trading in Korea, Malaysia, Singapore, Philippines and Thailand for both government and corporate bonds is almost complete, while the reporting of the price and volume of trades in Hong Kong, Korea, Malaysia, Singapore and Thailand ensures that the secondary market for bonds can

rating agencies and local agencies to rate issues in local currency has reduced information asymmetry in the markets.

Perhaps the most prominent initiative has been the move towards a regional bond market, and here there have been two major developments. First, following discussions among the senior executives of the regional central banks, the Asian Bond Fund, referred to as the ABF1, was launched in 2003. Initially this was a commitment by 8 East Asian and Pacific countries to set aside $1bn of reserve assets in a closed end fund to purchase dollar denominated Asian government bond issues. The ABF2 initiative, launched in 2005, extended the project to local currency government bond issues through the Pan Asian Bond Index Fund (PAIF) and the Fund of Bond Funds (FoBF). The investment was enlarged to $2bn per country in an open ended fund which was accessible to private sector investors - Eichengreen et al. (2006) report that the PAIF grew by 13% in its first 6 months of operation reflecting private sector participation. Second, an Asian Bond Market Initiative (ABMI) proposal to the ASEAN+3 Finance Ministers meeting in Manila 2003 spurred a number of initiatives to develop regional bond markets including a) the intention to create a robust primary and secondary market for securities by large sovereign bond issues by Asian governments and quasi-government agencies to establish benchmarks, b) Asian government financial institutions' financing requirements intention to meet in Asia, and c) a series of new ventures to create asset-backed securities markets, bond issues by multilateral development banks and government agencies, and bonds to fund foreign direct investment in Asian countries. Several working groups have been established to take these forward.

As previously stated, all these factors may encourage bond issuance and stimulate markets to grow and become more liquid. Larger markets with greater liquidity the more developed financial markets are likely to be, and this may encourage firms to issue bonds directly by reducing the costs of issue for firms and lowering the cost of entering and exiting the market for investors. As noted by Eichengreen et al. (2006), if there is a large trading volume, it may be possible for brokers to spread their fixed costs more widely and thus reduce transactions costs. It is generally accepted that investors are willing to invest in securities only if there is enough liquidity for them to sell and exit easily when needed, which depends on the overall market size and the trading volume exchanged. If liquidity is limited and the price discovery does not function well, the investors that participate will demand a higher interest rate to compensate for the low liquidity, and this in turn may further deter firms from issuing bonds. Local market size may be beneficial for firm-level bond issuance for other reasons. Local markets provide easier access to domestic firms that typically face thresholds that bar their entry to international bond markets. Local markets are better suited to the credit

utilize recent information.

needs of domestic small or medium-sized businesses compared to global investors operating in international markets. Underwriters and ratings agencies typically operate in global financial centers and therefore may show less interest in local issues which are typically smaller, but as local markets increase in size they can support local underwriters and ratings agencies, which are able to acquire and process local information more easily.

Growth in market size and liquidity may not influence all firms in a proportional way. Therefore we allow for the fact that firms of different sizes, with varying levels of profits, liquidity, debt and collateral might respond to the growth of the market size and liquidity disproportionately by measuring the indirect influence of these variables. We do this through interactions with firm-specific variables to capture indirect effects. Indirect effects on the probability of bond issuance reflect the fact that the marginal influence of such changes may vary according to a firm's characteristics. If greater market size and liquidity reduce uncertainty and thresholds for entry they may do so for those firms with characteristics that suggest they are on the margin of issuing bonds.

Policy initiatives seek to enhance market development and any influence on bond issuance by firms will occur through market developments.

3 Methodology

In order to determine how firm-specific characteristics, market development and the policy initiatives through ABF/ABMI affect the incentives for firms to undertake bond issues we evaluate the probability that a firm will issue a corporate bond as a function of these variables. We control for the firm-level influences on the decision to issue bonds through profitability, liquidity and debt to assets ratios, growth prospects, collateral assets and size, found to influence bond issuance at the firm level in developed countries (see Pagano et al. (1998), Datta et al. (2000) and Hale and Santos (2008)) as well as in emerging Latin American markets (see Aguilar et al. (2008); Braun and Briones (2008) and Castellanos and Martinéz (2008)). Then we consider market level developments by considering the local currency bond issues as a proportion of GDP (size) and the trading volumes in the secondary markets relative to the amount of bonds outstanding (liquidity). We also consider the impact of the ABF/ABMI policy by exploring splitting the sample period before and after the ABF/ABMI.

3.1 Estimation method

We follow the literature on the probability of a firm issuing a bond given a range of explanatory variables first suggested by Pagano et al. (1998) and Datta et al. (2000) who ask why

firms enter the public markets. We assume that there is an underlying response variable, y_{it}^* , the decision to issue a bond as a function of the vector of determinants of issuance. These determinants are a vector of firm-specific variables, $\mathbf{X}_{it}$. This is defined by the regression relationship, with slope parameters given by the vectors β and intercepts accounting for group effects a_i, and a normally distributed error term $\epsilon_{it} : y_{it}^* = \mathbf{X}_{it}\beta + \epsilon_{it}$

In practice, y_{it}^* is unobservable, and what we observe is a dummy variable y_i defined by

$$y_i = \begin{cases} 1 & \text{if the firm issues a bond at any time in the sample period,} \quad y_i = \mathbf{1}(y_i^* > 0) \\ 0 & \text{if the firm is a non-issuer.} \qquad\qquad\qquad\qquad\quad y_i = \mathbf{0}(y_i^* = 0) \end{cases}$$

The likelihood is constructed from observing the probability of observing outcomes y_i given the observed determinants, $\mathbf{X}_{it}$, hence

$$L = \prod_{i=1}^{N} \Pr(y_i = 1 \mid \mathbf{X}_{it}, \mathbf{Z}_t, \gamma, \beta, \alpha_i)^{y_i} \Pr(y_i = 0 \mid \mathbf{X}_{it}, \mathbf{Z}_t, \gamma, \beta, \alpha_i)^{1-y_i}$$

and we maximize the log likelihood

$$\ln L(\beta, \alpha_i \mid \mathbf{X}_{it}) = \sum_{i=1}^{N} (y_i \ln \Pr(y_i = 1 \mid \mathbf{X}_{it}, \beta, \alpha_i) + (1 - y_i) \Pr(y_i = 0 \mid \mathbf{X}_{it}, \beta, \alpha_i)$$

where $\Pr(y_i = 1 \mid \mathbf{X}_{it}, \beta, \alpha_i) = F(\mathbf{X}_{it}\beta + \alpha_i)$ and $\Pr(y_i = 0 \mid \mathbf{X}_{it}, \beta, \alpha_i) = 1 - F(\mathbf{X}_{it}\beta + \alpha_i)$, to obtain parameter estimates β and α_i and establish the impact of the firm-specfic and market determinants and the group effects.

For firm-specific effects the reported coefficients on the determinants can be adjusted to establish the marginal effect of a change in the element of $x_{it} \in \mathbf{X}_{it}$ on $\Pr(y_i = 1 \mid \mathbf{X}_{it}, \mathbf{Z}_t, \gamma, \beta, \alpha_i)$ by calculating

$$\frac{\partial \Pr(y_i = 1 \mid \mathbf{X}_{it}, \beta, \alpha_i)}{\partial x_{it}} = F(\mathbf{X}_{it}\beta + \alpha_i).b$$

where b is the estimated parameter on element x_{it}.

We then consider an extension to the model to allow for the influence of market development variables. Re-writing the log likelihood as

$$\ln L(\gamma^d, \beta, \alpha_i \mid \mathbf{X}_{it}) = \sum_{i=1}^{N} (y_i \ln \Pr(y_i = 1 \mid \mathbf{X}_{it}, \mathbf{Z}_t, \gamma^d, \gamma^i, \beta, \alpha_i) + (1 - y_i) \Pr(y_i = 0 \mid \mathbf{X}_{it}, \mathbf{Z}_t, \gamma^d, \gamma^i, \beta, \alpha_i)$$

this allows market development variables represented by $\mathbf{Z}_t$ to have direct effects on the probability of issue, through γ^d, and indirect effects on the probability of issue, γ^i, by interacting with firm-specific variables, $\mathbf{X}_{it}$. We can therefore consider the direct marginal effect of a change in the element of $z_t \in \mathbf{Z}_t$ on $\Pr(y_i = 1 \mid \mathbf{X}_{it}, \mathbf{Z}_t, \gamma^d, \gamma^i, \beta, \alpha_i)$ as

$$\frac{\partial \Pr(y_i = 1 \mid \mathbf{X}_{it}, \mathbf{Z}_t, \gamma, \beta, \alpha_i)}{\partial z_t} = F(\mathbf{X}_{it}\beta + \mathbf{Z}_t\gamma^d + \mathbf{X}_{it}\mathbf{Z}_t'\gamma^i + \alpha_i).(g^d + g^i x_{it})$$

where the indirect effect g^i allows for the heterogeneous effect of market developments on each firm according to the interaction with each element x_{it} of the firm-specific vector of variables.

Since policy initiatives operate largely through market size and liquidity we estimate the model separately for sub-samples before an after the policy initiative was undertaken to see if there was a significant difference in the coefficient values and marginal effects.

Lastly, we allow for reputation. Reputation is strictly a firm-specific variable, among the $\mathbf{X}_{it}$ variables considered earlier, but we explore its effect separately because it is closely connected to issuing activity in the bond market on previous occasions and to the firm's performance as evaluated by those markets.

3.2 Empirical specification

We begin our inquiry with a baseline model of the following format:

$$\begin{aligned} Pr(BOND_{it} = 1) = F(&a_0 + a_1 SIZE_{i(t-1)} + a_2 GROWTH_{i(t-1)} + a_3 YEARS_{i(t-1)} \\ &+ a_4 LEVER_{i(t-1)} + a_5 PROF_{i(t-1)} + a_6 LIQUID_{i(t-1)} + a_7 COLL_{i(t-1)} + a_8 REP_{it} + \epsilon_{it}) \end{aligned}$$

where BOND is a dummy variable that equals 1 if firm i issued a bond in year t, and 0 otherwise. $F(.)$ denotes the standard normal distribution function. Our specification includes regressors evaluated at time t-1 to mitigate potential endogeneity concerns.[5] The model evaluates the firm's probability to issue bonds based on firm-specific variables based on size and growth opportunities, the track record acquired from the stock market and financial health e.g. SIZE, GROWTH, YEARS, LEVER, PROF, LIQUID, COLL and REP.

It is widely recognized that a firm's size plays an important role in determining access to public finance, Datta et al. (2000), and is expected to increase the probability of a bond

[5] We corroborate our findings using regressors at time t. Both empirical models suggest a common story. These results are not reported for brevity, but are available upon request.

issue. Large firms obtain finance from equities, issue of securities and bank finance, while smaller firms with more severe information problems tend to borrow from banks and private creditors. In addition, a large and growing set of empirical findings supports the view that flotation costs make bond financing unattractive to small firms intent on raising small amounts of funding from the market: Blackwell and Kidwell (1988) and Krishnaswami et al. (1999) show that flotation costs of public issues make this funding source economically viable only for firms seeking large amounts of funding. To control for size (SIZE) we include the logarithm of the firm's total assets consistent with Calomiris et al. (1995). Growing firms are more likely to issue bonds than firms that have fewer opportunities for expansion because they have greater demand for external funding (see Pagano et al. (1998) and Datta et al. (2000)). In our data GROWTH is measured by growth in sales. To control for the age of the firm we include a variable measuring the number of years a firm has been listed in the stock exchange (YEARS).

The financial condition of the firm is also an important determinant of access to external finance as argued by Leland and Pyle (1977), Rajan (1992) and Bougheas et al. (2006). We consider four dimensions of financial health from the balance sheet, namely leverage, profitability, liquidity and collateral assets in total assets. We define leverage (LEVER) as total debt over total assets, to measure the firm's overall indebtedness. Considering the likely response of the probability of bond issue to these variables we remark that high leverage can be associated with an unhealthy balance sheet and therefore firms with higher levels of debt face greater difficulties obtaining funds on the markets, especially during recessions (see Cantor (1990) and Bougheas et al. (2006)). Should this effect prevail, one would observe a negative relationship between leverage and the likelihood of bonds issuance. Yet, some authors argue that the probability of raising public finance increases with firms' leverage (see Pagano et al. (1998), Datta et al. (2000)and Dennis and Mihov (2003)) since a high rate of leverage can be seen as an indicator of a good credit standing and high borrowing capacity of firms. If this is the case, we would expect a positive relationship between leverage and the probability to issue bonds.

The profitability ratio (PROF), is defined as earnings before interest and taxes relative to total assets, to measure a firm's ability to generate profits. Dennis and Mihov (2003) argue that bond financing should be more viable for firms with high profits. Therefore, the more profitable firms the more likely to issue bonds. In other words, we expect a positive relationship between profitability and the probability to issue corporate bonds.

As an additional balance sheet indicator, we employ the liquidity ratio (LIQUID) measured by current assets over total liabilities. This variable has been used in earlier studies (Mateut et al. (2006)), as an indicator of the liquid assets of the firm. As with leverage this

variable can have a coefficient of either sign, since liquidity indicates both the need to raise funds due to low shareholder equity, and a signal of low creditworthiness. Hale and Santos (2008) find that firms with more liquidity take longer to enter the public bond market due to the fact that they have substantial internal funds, which confirms the findings of Guariglia and Poncet (2008) and Guariglia et al. (2010).

We include a measure of tangible assets which proxies for the firm's ability to pledge collateral for debt finance. Collateral (COLL) is defined as tangible assets over total assets. Access to collateral assets was very important in studies on debt composition (Demirguc-Kunt and Maksimovic (1999) and Booth et al. (2001)). Assets that are more tangible, sustain more external financing because tangibility increases the value that can be recaptured by creditors in case of borrower's default. Thus we expect to find that high values of collateral increase the probability to issue corporate bonds.

We use local market size or market liquidity terms represented by $IND_t = MKTSIZE_t$ or $MKTLIQ_t$ that measure bond market development along the lines of Chinn and Ito (2006). The estimated model is specified as follows:

$$\begin{aligned} Pr(BOND_{it} = 1) = F(a_0 + a_1 SIZE_{i(t-1)} + a_2 SIZE_{i(t-1)} * IND_t \\ + a_3 YEARS_{i(t-1)} + a_4 YEARS_{i(t-1)} * IND_t \\ + a_5 GROWTH_{i(t-1)} + a_6 GROWTH_{i(t-1)} * IND_t \\ + a_7 LEVER_{i(t-1)} + a_8 LEVER_{i(t-1)} * IND_t \\ + a_9 PROF_{i(t-1)} + a_{10} PROF_{i(t-1)} * IND_t \\ + a_{11} LIQUID_{i(t-1)} + a_{12} LIQUID_{i(t-1)} * IND_t \\ + a_{13} COLL_{i(t-1)} + a_{14} COLL_{i(t-1)} * IND_t + a_{15} IND_t + \epsilon_{it}) \end{aligned}$$

Market development terms are allowed to influence the probability of issue directly, judged from the sign and significance of the coefficient a_{15}, which shows the reduction in costs associated with issuing as markets develop. They can also influence the probability of issue indirectly, as judged from the sign and significance of the coefficients $a_2, a_4, a_6, a_8, a_{10}, a_{12}$ and a_{14}, where we suggest the influence is determined in conjunction with a firm's characteristics since not all firms may benefit to the same degree from market developments.

The influence of ABMI operates through market development variables. Larger and more liquid markets for sovereign bonds aim to stimulate the market for corporate bonds. By comparing the influence of market development indicators before and after the policy initiatives took place we can see whether the initiatives had any direct or indirect influence

on corporate bond issuance. To investigate the hypothesis we compare the coefficients using equality of coefficient tests in pre-ABMI and ABMI periods.

Finally, we explore the role of reputation. There are two dummy variables we use here represented by $REP_{it} = PREV.ISSUE_{it}$ or $RATING_{it}$. The first dummy variable takes a value of one if the firm has previously issued bonds and has acquired some presence in the bond market. The second dummy variable that takes the value one if the firm has not previously experienced a ratings downgrade. The estimated model is specified as follows:

$$\begin{aligned} Pr(BOND_{it} = 1) = F(a_0 &+ a_1 SIZE_{i(t-1)} + a_2 SIZE_{i(t-1)} * IND_t \\ &+ a_3 YEARS_{i(t-1)} + a_4 YEARS_{i(t-1)} * IND_t \\ &+ a_5 GROWTH_{i(t-1)} + a_6 GROWTH_{i(t-1)} * IND_t \\ &+ a_7 LEVER_{i(t-1)} + a_8 LEVER_{i(t-1)} * IND_t \\ &+ a_9 PROF_{i(t-1)} + a_{10} PROF_{i(t-1)} * IND_t \\ &+ a_{11} LIQUID_{i(t-1)} + a_{12} LIQUID_{i(t-1)} * IND_t \\ &+ a_{13} COLL_{i(t-1)} + a_{14} COLL_{i(t-1)} * IND_t + a_{15} IND_t + a_{16} REP_{it} + \epsilon_{it}) \end{aligned}$$

In all cases we indicate whether our model includes country dummies to control for institutional differences between countries, time dummies accounting for common trends and business cycle effects and industry dummies to control for fixed effects across industries. We now turn to the dataset used for this exercise.

4 Data

4.1 Data description

The data on bond issues are drawn from Bondware and Bloomberg, firm-specific characteristics from the balance sheet and profit and loss accounts are taken from Thomson Financial and bond market development indicators are from the Asian Development Bank and Bank for International Settlements. These are combined in a new way to cast light on the probability of corporate bond issuance in the Asian region. The data cover firms in both emerging and developed Asian economies namely China, Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand and span the time period 1995 through 2007, which covers a period of major bond market development. Our sample takes into account the fact that there is a wide regional variation in Asian markets in terms of size, liquidity and sophistication.

We use Bondware to identify all corporate bonds issued in international markets to gather information about the issue dates, denomination, currency and the maturity in the bonds measured.[6] We are also able to identify the type of the coupon (i.e zero coupon, fixed and floating). For the purpose of our analysis we focus on fixed rate bonds. We use Bloomberg to identify similar data for firms that issue bonds in the domestic Asian markets. Our coverage of bond issues therefore embraces both firms with issues in hard currencies, which are almost exclusively US dollar denominated, and firms with local currency denominated bonds. Although local currency issuance first started to capture the market's attention in the late 1990s new issues in local currency now exceed new issues in dollars for most countries therefore it is important to consider both the local and international currency issues in the Asian markets in order to avoid mis-representing the scale of corporate bond issuance.

The Thomson Financial Primark database offers balance sheet and profit and loss accounts data for firms in the East Asian region. The data set that we use in our estimations includes a total of 41,921 annual observations on 4,661 companies. We provide information on financial accounts and ratios for Asian firms operating in all sectors of the economy for the years 1995-2007. The previous section reported the exact definitions of firm-specific variables used in the empirical specification.

Bond market depth indicators are taken from the Asian Development Bank and the Bank for International Settlements. Following Chinn and Ito (2006) and Eichengreen et al. (2006) we use two indicators to assess the depth of the Asian markets: the ratio of local currency bond issues relative to GDP and the extent of trading in the secondary market relative to the amount of bonds outstanding. The size of local currency bond obligations as a percentage of nominal GDP measures the size of the domestic markets compared to the output of the economy, while the trading volume is a measure of bond market liquidity. Arguably the more liquid the market is the lower its transactions costs and the less impact trades have on market price (see Jiang and McCauley (2004)). These variables can be observed in Figure 2, where we observe that the level of local currency obligations as a percentage of nominal GDP (LCY) and trading volume (TRVOL). These figures refer to the eight economies included in the present study. There is a noticeably high growth in the post crisis period, followed by a decline after 2001 and subsequent increase. LCY has maintained levels between two and a half times higher than values in 1995, and if anything the crisis has spurred local issues of bonds not diminished it. Burger and Warnock (2007) argue that emerging economies are able to develop local currency bond markets if they are given the opportunity to do so, and this seems to be borne out by the data. The decline in LCY after 2001 may be due to the

[6]Our definition of corporate bonds is in line with recent studies on Asian bond markets (see Gyntelberg et al. (2005)) and includes all non-government long-term issues in a given currency.

reduction in LCY in Indonesia and Malaysia. Trading volume (TRVOL) in the East Asian region has grown rapidly over the past ten years, from negligible values before 1999 to over 100 percent of the outstanding volume of bonds. This indicates that secondary markets have become more liquid, which reflects the greater diversity of investors and the relative improvement in the trading environment due to faster settlement, more rapid dissemination of information and so on.

Following normal selection criteria used in the literature, we exclude companies that did not have complete records for all explanatory variables and firm-years with negative sales. We also require the firms have at least 3 consecutive time-series observations. To control for the potential influence of outliers, we exclude observations in the 0.5 percent from upper and lower tails of the distribution of the regression variables. Finally, by allowing for both entry and exit, the panel has an unbalanced structure which helps mitigate potential selection and survivor bias. Our combined sample contains data for 546 firms in China, 442 in Hong Kong, 385 in Indonesia, 910 in Korea, 961 in Malaysia, 240 in the Philippines, 582 in Singapore and 595 in Thailand that operated between 1995 and 2007 in a variety of sectors including manufacturing, utilities, resources, services and financials.

4.2 Descriptive analysis

Summary statistics for the variables used in our empirical analysis are provided in Table 1. The figures are presented for all firms (panel A), those firms that are issuers (panel B) and those that are non-issuers (panel C) reporting mean, standard deviation, minimum and maximum values and the number of firms. In a sample of 4661 firms, 100 issued continuously through the sample period, 443 began to issue at some point in the sample, and 4118 firms never issued. We observe that size and growth opportunities are very different for issuers and non-issuers and the differences are statistically significant in both cases.[7] Firms with bonds issues are always larger with a log of assets equal to 17.23 (issuers) compared to 14.35 (non-issuers)and have higher growth (10.5% versus 6.4%). Dennis and Mihov (2003) and Hale and Santos (2008) indicate that larger firms have more public debt and Datta et al. (2000) find that the likelihood of bond issues is increasing in the firm's size and need for external funding. This finding is also consistent with the literature on Latin American bond markets (see Aguilar et al. (2008), Braun and Briones (2008) and Castellanos and Martinéz (2008)). There are many more non-issuers (88.7%) than issuers (11.3%) in our sample.

On the basis of mean values of many financial indicators we find that issuing firms are significantly different from non-issuing firms. Issuers are more leveraged and less liquid,

[7]The figures for size are reported as logarithms of total assets and therefore mask to some degree the extent of the scale differences.

having a leverage ratio of 37% (issuers) to 26% (non-issuers) and a liquidity ratio of 41% (issuers) to 48% (non-issuers) This supports the notion put forward by a number of studies (see Pagano et al. (1998), Datta et al. (2000) and Dennis and Mihov (2003)) that highly leveraged firms are successful and have higher borrowing capacity. In addition, since issuing firms have greater debt, and less liquidity, they have greater incentive to access bond markets for additional finance. We also find that bond issuers are more profitable but the difference is at the margin of significance. There is little difference between the collateral of issuers and non-issuers, therefore having more tangible assets is not necessarily an advantage for bond issuance, unlike for bank finance where tangible assets can be pledged as collateral. We therefore note that firms' balance sheet indicators are significantly different for issuers compared to non-issuers, and these differences are not negligible, and it is possible that differences in financial health is an important determinant of the decision to issue bonds in Asia.

5 Main results

In this section we report the estimation results for the probit models, where all firm-level variables are lagged one period to deal with endogeneity; we present coefficients and z-statistics from the probit model and marginal effects, and country, industry and year dummies are included. All firms in our panel are listed on the stock market.

5.1 Firm-specific characteristics

Table 2 reports the estimates for the baseline model that examines the relationship between firm-specific characteristics and the probability that a firm will issue bonds. Column 1 presents the model with time and industry dummies but without country effects, while in column 3 we add country effects. Columns 5 and 7 report a version of the model taking into account reputation measures using previous bond issuance and no downgrades of ratings. Columns 2, 4, 6 and 8 give the marginal effects of the variables on the probability of issuance in the current period.

Looking at the results in all eight columns, we see that even after allowing for time and country dummies in columns 1 and 3 respectively, there is a significant impact of firm-specific characteristics on the decision to issue, since almost all variables are significant at the 1 percent level or else at the 5 percent level. Introduction of country dummies reduces the impact of all variables, with the exception of the size variable, although all variables remain highly significant.

As expected the size of the firm has a positive impact on the probability to issue a bond, indicating that the larger is the firm the more likely it is to issue bonds. The marginal effects in Table 2 demonstrate that a one percent increase in real assets results a 0.05 increase in probability to issue bonds. This result may reflect the high fixed costs of issuing bonds that favor larger firms, or it may be a result of the information asymmetry problem that small firms face and the finding is consistent with results reported in papers that use these arguments (see Calomiris et al. (1995), Johnson (1997), Krishnaswami et al. (1999), Cantillo and Wright (2000), and Dennis and Mihov (2003)); it is also found to be a key determinant of a firm's decision to issue bonds in studies of Latin American bond markets (see Aguilar et al. (2008), Braun and Briones (2008) and Castellanos and Martinéz (2008)). Growth in sales also affects the decision to issue bonds positively (the marginal effect is 0.01). We conclude that there is a minimum efficient scale to overcome before bond finance is economically feasible, and the decision to access bond markets is driven by financing needs proxied by growth in sales. Finally, the probability of bond issuance marginally decreases with the number of years a firm has been listed in the stock market which implies that bonds and stocks are substitutes. This result is in line with earlier reported evidence in Latin American bond markets (see Aguilar et al. (2008)).

The financial health indicators of the firm show that creditworthiness has a role to play in determining the probability of bond issue. The higher firms' leverage (LEVER) the more likely they are to issue corporate bonds compared to those with lower leverage. The positive effect is economically significant since a unit increase in leverage would increase the probability of bond issuance by 0.09-0.12. Higher leverage can be taken as a sign that firms have been able to access debt from banks or markets in the past, Braun and Briones (2008), perhaps in order to realize growth opportunities rather than of overindebtedness. In this case it is a characteristic that increases the probability of issuing bonds, similar findings have been reported for Latin America (see Aguilar et al. (2008) and Braun and Briones (2008)).

Profitability (PROF) is also a characteristic that might be expected to have a positive influence on the decision to issue bonds. We find it raises the probability of issue by 0.05-0.08 in Table 2. Two recent studies for Latin American countries find positive and significant coefficients (Aguilar et al. (2008) and Castellanos and Martinéz (2008)), while two others find negative or insignificant coefficients (Braun and Briones (2008) and Fernández et al. (2008)).[8] It is to be expected that greater profitability enhances bond issuance in our case.

[8]A negative coefficient would be consistent with the pecking order theory of Myers and Majluf (1984), where more profitable firms seek alternative, lower cost, forms of finance rather than bond finance. In the Latin American studies above, where the coefficient is negative, the data contain both listed and unlisted firms, and listing has a negative effect on the probability of bond issuance. In our case all firms are already

Liquidity (LIQUID) and collateral (COLL) have negative and positive influences respectively on the probability that a firm will issue bonds. Firms with greater liquidity may not require additional financing through the bond market, as suggested by Guariglia and Poncet (2008) and Guariglia et al. (2010), while those with greater collateral may find it easier to obtain finance if they need it.

The predictive ability for bond issuance, based on the goodness of fit statistic, improves from 0.17 to 0.23 with the addition of country dummies, and this suggests that country effects are important for firms in our sample. The improvement in the same measure when we introduce the dummy allowing for the issue of bonds in the previous period raises the statistic to 0.65. This gives a strong indication that exposure to the bond market in the previous year is an important determinant of the decision to issue bonds this period. Being an issuer in the previous period substantially influences the probability of issuing today, raising the probability by 0.45. The impact of this variable is much larger than the largest marginal effect for any other variable in column 6. Thus firms that issue in the previous period are quite likely to issue in the current period, and this dominates every other influence on their decision. This may reflect the fact that once firms gain access to bond markets by meeting certain criteria for viable participation, they continue to access it, but only 100 firms (2 per cent of our sample) had continuous issues, while 543 firms (12 per cent) issued at some point in the sample. It is possible that previous issuance is a reputation proxy, and to test this hypothesis we consider firms that have reputation from not having been downgraded in column 7. The coefficient is strongly significant, and the marginal effect is 0.170, which is larger than the influence of any firm specific characteristic. These results demonstrate that reputation from presence in the market and from a consistent market rating raise the probability of issuance in future periods. We now consider the effect of financial market development on corporate bond issuance.

5.2 Market development

Having identified a significant relationship between firm-specific variables and probability of bond issuance in the emerging Asian market, we now explore whether this relationship has been influenced by the development of the markets in terms of local market size and liquidity. According to our hypothesis, when markets become more liquid and larger, these characteristics should reduce the cost of bond market participation for issuers and investors, and mitigate the effects of weaker firm-specific variables. The former is the direct effect of bond market development on the probability of issuance, while the latter is the indirect

listed and therefore have met the profitability threshold to obtain equity finance, and greater profitability would not necessarily alter incentives based on the pecking order theory to issue equity instead of bonds.

effect operating through interactions with firm-specific variables.

Results for the augmented model are reported in Tables 3 and 4, the first indicates the influence of $IND_t = MKTLIQ_t$, measured by secondary market trading volume, and the second reports the influence of $IND_t = MKTSIZE_t$, measured by the scale of the local market to GDP.

Beginning with a model that ignores reputation measures in column 1, we find that market liquidity in Table 3 has a negligible direct effect and a small, occasionally significant indirect effect through firm specific variables. The marginal effects of our firm-specific variables show similar marginal effects to those reported in Table 2 column 1. In Table 4, where we consider the influence of market size, we find the direct effect is positive and significant, but has much less influence over corporate bond issuance than firm-specific variables, and indirect effects are occasionally significant but the impact is small.

Therefore we conclude that the measurable effect of financial market development on corporate bond issuance is rather small and dominated by the influence of other firm-specific characteristics. We turn now to bond market initiatives.

5.3 Bond market development initiatives

Here we examine the effects of bond market development on bond issuance and whether they have evolved over time. We focus on two sub-periods: 1995-2002 and 2003-2007. Starting in June 2003 eight east Asian countries purchased dollar denominated bonds issued by Asian governments through the Asian Bond Fund (ABF1), and in June 2005 launched a new fund to purchase local currency bonds from Asian countries (ABF2). We refer to this entire policy operation as the Asian Bond Market Initiative (ABMI). While the ABF was relatively modest in terms of size, it sent a positive signal to bond markets, and many market facilitating policies that supported it have improved bond market function. Therefore our previous results on market development may have been more pronounced after this period.

We report results in Tables 5 and 6. Table 5 refers to the possibility that ABMI influence bond markets through market liquidity and firm-specific characteristics while Table 6 refers to the influence through market size and firm characteristics. The sign and overall significance of variables determines whether there is any influence in each period, and the comparison of coefficient values and the marginal effects for each sub-period tells us whether the policy initiative made any difference to the probability to issue bonds. We have three comparisons using models without reputation considerations, with reputation measured by previous issues, and with reputation measured by no downgrades. The results are reported in the three panels of each table for two distinct sub-samples. we test whether the coefficients

in the different sub samples are statistically different from each other and the p-values of the tests are reported at the foot of the Tables 5 and 6.

In almost every case we find that the coefficient values and the marginal effects of the market development variables and their interactions are identical in each sub sample. Tests of equality do not reject the null that they are equal. So we conclude that ABMI has made little difference to corporate bond issuance. Its influence on the market through direct and indirect effects is greatly dominated by the influence of firm characteristics and even more so by the influence of previous decision to issue bonds. We continue to find however that reputation measures influence the decision.

5.4 Reputation in the bond market

Our finding that market development and bond market initiatives have had little effect on corporate bond issuance is somewhat surprising. Firm specific characteristics have much more influence over bond issuances than the size or liquidity of the bond market, or the initiatives to improve the functioning of the bond market. But reputation in the bond market seems even more important. A consistent finding in all our tables of results is that reputation in the bond market from having previously issued bonds and not having experienced a rating downgrade is the most important influence on corporate bond issuance.

6 Conclusion

Financial integration in Asia varies across capital markets and the development of regional bond markets is high on the priority list for policy makers, see BIS (2005) and IMF (2005). This paper has examined the determinants of bonds issuance using a novel dataset for eight emerging Asian economies - China, Hong Kong, Indonesia, Korea, Malaysia, the Philippines Singapore and Thailand.

We ask how firm characteristics, financial market characteristics and bond market initiatives have contributed to the probability that a firm will issue bonds. Our conclusion is that firm-specific characteristics alone have had some impact on the probability of issue; but market development indicators such as size and liquidity have much smaller direct and indirect effects on issuance of corporate bonds. This is in spite of the expectation that larger markets with greater liquidity encourage firms to issue bonds directly by reducing the costs of issue for firms and lowering the cost of entering and exiting the market for investors.

Neither do we find a great deal of influence from bond market policy initiatives on the part of governments in the ASEAN economies on corporate bond issuance. There is little evidence

that there was a difference in the response to any of our financial market variables after the ABMI initiative occurred. The result is surprising because it suggests market development and policy initiatives did not create a major incentive for firms to issue bonds. But one feature among firm characteristics does matter - the firms' reputation in the bond market. We measure this in tow ways using evidence that a firm had previously issued bonds and recording whether the firm had experienced a rating downgrade. The benefit conferred by these two measures is considerable, accounting for the most influence on the firm's decision to issue a bond. Other authors have found that reputation can have a significant influence on the timing of bond issues (see Hale and Santos (2008)) and our paper develops that view, suggesting that reputation influences whether to issue as well as the timing.

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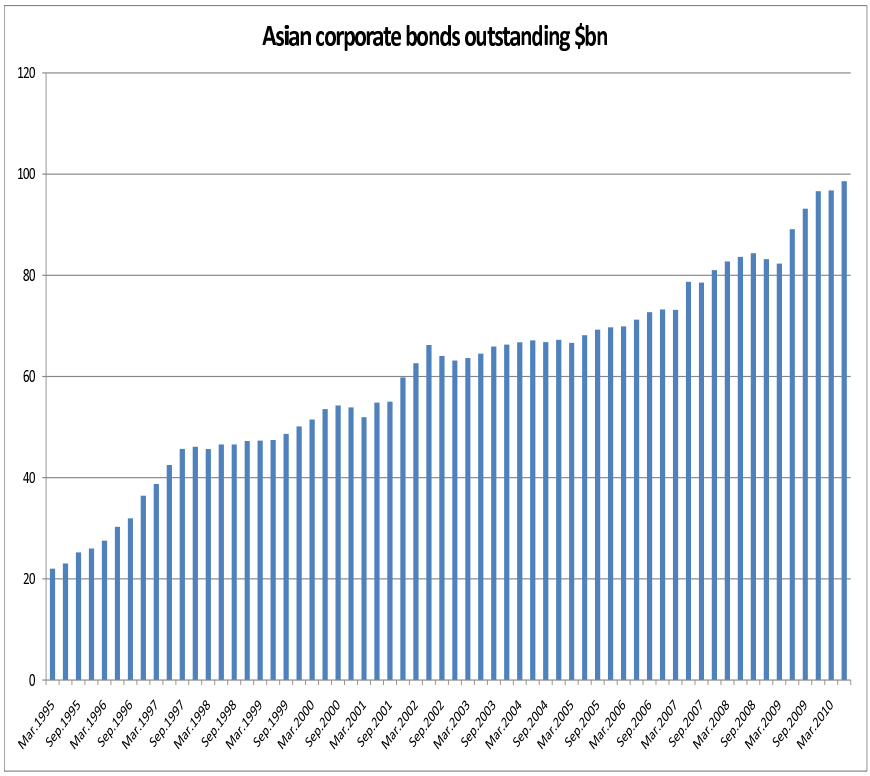

Figure 1: Evolution of Asian bond issues

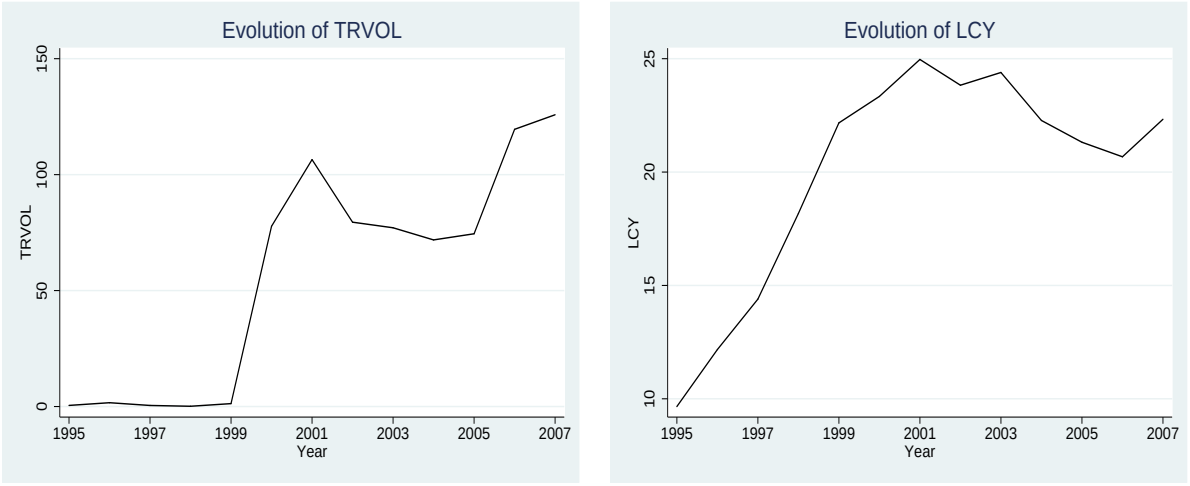

Figure 2: Evolution of bond market development

Notes: TRVOL measures the extent of trading in the secondary market relative to the amount of bonds outstanding. LCY shows the size of local currency bond obligations as a percentage of nominal GDP.

Table 1A
Descriptive Statistics-All firms

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
$SIZE$	14.676	2.974	8.970	24.26	26074
$GROWTH$	0.068	0.424	-2.883	2.417	26074
$LEVER$	0.272	0.231	0	2.258	26074
$PROF$	0.035	0.14	-1.041	1.223	26074
$LIQUID$	0.473	0.215	0.011	0.98	26074
$COLL$	0.027	0.061	-0.021	0.587	26074

Notes: $SIZE$: Logarithm of total assets. $GROWTH$: Growth in sales. $LEVER$: Total debt to total assets. $PROF$: Earnings before interest and taxes relative to total assets. $LIQUID$: Current assets over total liabilities. $COLL$: Tangible assets relative to total assets. Currency units are US$.

Table 1B
Descriptive Statistics-Issuers

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
$SIZE$	17.23	3.493	9.038	24.26	2941
$GROWTH$	0.105	0.354	-2.47	2.408	2941
$LEVER$	0.369	0.208	0	1.806	2941
$PROF$	0.036	0.12	-1.035	0.889	2941
$LIQUID$	0.411	0.195	0.014	0.972	2941
$COLL$	0.03	0.061	-0.021	0.587	2941

Notes: $SIZE$: Logarithm of total assets. $GROWTH$: Growth in sales. $LEVER$: Total debt to total assets. $PROF$: Earnings before interest and taxes relative to total assets. $LIQUID$: Current assets over total liabilities. $COLL$: Tangible assets relative to total assets. Currency units are US$.

Table 1C
Descriptive Statistics-Non-Issuers

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
$SIZE$	14.351	2.736	8.970	23.78	23133
$GROWTH$	0.064	0.432	-2.883	2.417	23133
$LEVER$	0.26	0.23	0	2.258	23133
$PROF$	0.034	0.142	-1.041	1.223	23133
$LIQUID$	0.481	0.216	0.011	0.98	23133
$COLL$	0.026	0.061	-0.021	0.583	23133

Notes: $SIZE$: Logarithm of total assets. $GROWTH$: Growth in sales. $LEVER$: Total debt to total assets. $PROF$: Earnings before interest and taxes relative to total assets. $LIQUID$: Current assets over total liabilities. $COLL$: Tangible assets relative to total assets. Currency units are US$.

TABLE 2
THE BASELINE MODEL

1995-2007	Coef. (1)	M.E (2)	Coef. (3)	M.E (4)	Coef. (5)	M.E (6)	Coef. (7)	M.E (8)
SIZE	0.168***	0.024	0.364***	0.047	0.287***	0.004	0.354***	0.046
	(39.34)		(37.57)		(21.14)		(36.24)	
GROWTH	0.106***	0.015	0.077**	0.010	0.088*	0.001	0.076**	0.009
	(3.79)		(2.41)		(1.82)		(2.39)	
YEARS	0.015***	0.002	-0.005**	-0.001	-0.030***	-0.0001	-0.004*	-0.0006
	(5.92)		(-1.99)		(-7.56)		(-1.81)	
LEVER	0.875***	0.126	0.749***	0.096	0.431***	0.006	0.753***	0.096
	(17.40)		(13.26)		(4.45)		(13.34)	
PROF	0.554***	0.080	0.380***	0.049	0.147	0.002	0.384***	0.048
	(5.59)		(3.15)		(0.89)		(3.19)	
LIQUID	-0.164***	-0.024	0.091	0.012	-0.490***	-0.007	-0.093	-0.011
	(-2.72)		(1.37)		(-4.71)		(-1.41)	
COLL	0.717***	0.103	0.459**	0.059	1.874***	0.027	0.477**	0.058
	(3.98)		(2.19)		(5.65)		(2.30)	
REP=PREV.ISSUE					3.040***	0.447		
					(49.55)			
REP=RATING							0.148***	0.170
							(5.64)	
Observations	26074		26074		26074		26074	
R^2	0.17		0.23		0.65		0.23	
Time dummies	Yes		Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes		Yes	
Country dummies	No		Yes		Yes		Yes	

Notes: The Table reports the effects of the variables listed on the probability to issue bonds by a probit model. Columns 2, 4 and 6 report the marginal effects evaluated at covariate means. The dependent variable is a dummy equal to one if the firm is a bond issuer, and zero otherwise. Robust z-statistics in parentheses. All firm-specific variables are lagged one period. SIZE denotes the logarithm of total assets. GROWTH is the growth in sales. YEARS shows the number of years a firm has been listed in the stock exchange. LEVER is the ratio of total debt over total assets. PROF is the ratio of earnings before interests and taxes to total assets. LIQUID is measured as current assets to total liabilities. COLL is the ratio of tangible assets to total assets. PREV. ISSUE is a dummy variable takes a value of one if the firm has previously issued bonds. RATING is a dummy variable that takes the value one if the firm has not previously experienced a ratings downgrade. The following countries were included in the regressions: China, Indonesia, Hong Kong, Malaysia, Korea, Philippines, Singapore and Thailand.

Table 3
Market liquidity

	Coeff.	M.E.	Coeff.	M.E	Coeff.	M.E
	(1)	(2)	(3)	(4)	(5)	(6)
SIZE	0.337***	0.048	0.261***	0.005	0.337***	0.050
	(11.84)		(16.81)		(30.82)	
SIZE*IND	0.00001	0.000	0.00003	0.000	0.00001	0.000
	(0.39)		(0.49)		(0.54)	
GROWTH	0.094**	0.013	0.052	0.001	0.090	0.012
	(2.34)		(0.81)		(2.11)	
GROWTH*IND	-0.0001	-0.00001	0.000	0.000	-0.00009	-0.00001
	(-0.32)		(0.32)		(-0.30)	
YEARS	-0.007	-0.001	-0.011*	-0.0001	-0.007*	-0.0009
	(-0.75)		(-1.82)		(-1.77)	
YEARS*IND	0.00002	0.000	-0.000***	-0.000	0.00002	0.000
	(0.43)		(-4.62)		(0.91)	
LEVER	0.653***	0.094	0.180	0.004	0.651***	0.093
	(4.21)		(1.40)		(8.65)	
LEVER*IND	0.001	0.00001	0.001	0.00001	0.001**	0.00001
	(1.33)		(1.48)		(2.34)	
PROF	0.601**	0.086	0.273	0.006	0.603***	0.086
	(2.30)		(1.13)		(3.71)	
PROF*IND	-0.003**	-0.0002	-0.003*	-0.0002	-0.003***	-0.0004
	(-2.08)		(-1.66)		(-3.08)	
LIQUID	0.201	0.029	-0.491***	-0.010	0.195**	0.028
	(1.00)		(-3.68)		(2.36)	
LIQUID*IND	-0.002**	-0.0003	-0.002**	-0.0001	-0.002***	-0.0003
	(-2.15)		(-2.15)		(-4.17)	
COLL	0.017	0.002	2.277***	0.047	0.021	0.002
	(0.03)		(5.22)		(0.07)	
COLL*IND	0.006	0.001	-0.007*	-0.0004	0.006***	0.0008
	(1.41)		(-1.91)		(2.67)	
IND	0.0001	0.00001	0.002***	0.0003	0.0001	0.00003
	(0.22)		(3.29)		(0.31)	
REP=PREV.ISSUE			2.997***	0.468		
			(48.11)			
REP=RATING					0.458	0.055
					(1.20)	
Observations	19534		19534		19534	
R^2	0.22		0.65		0.22	

Notes: The Table reports the effects of the variables listed on the probability to issue bonds by a probit model. IND is a variable measuring MARKET LIQUIDITY based on the extent of trading in the secondary market relative to the amount of bonds outstanding. Time dummies, industry dummies and country dummies are included in the models. Also see notes to Table 2.

TABLE 4
MARKET SIZE

	Coeff.	M.E.	Coeff.	M.E	Coeff.	M.E
	(1)	(2)	(3)	(4)	(5)	(6)
SIZE	0.456***	0.057	0.389***	0.005	0.455***	0.056
	(26.61)		(17.47)		(26.54)	
SIZE*IND	-0.003***	-0.0004	-0.004***	-0.0003	-0.003***	-0.0004
	(-6.86)		(-5.24)		(-6.91)	
GROWTH	0.112	0.014	0.197*	0.002	0.109	0.013
	(1.54)		(1.89)		(1.50)	
GROWTH*IND	-0.001	-0.00001	-0.004	-0.0002	-0.001	-0.0001
	(-0.47)		(-1.05)		(-0.46)	
YEARS	0.007	0.001	0.005	0.0003	0.007	0.0009
	(1.28)		(0.62)		(1.31)	
YEARS*IND	-0.0004**	-0.00005	-0.001***	-0.0001	-0.0004**	-0.00001
	(-2.25)		(-4.59)		(-2.27)	
LEVER	0.734***	0.091	0.843***	0.010	0.733***	0.091
	(6.54)		(4.55)		(6.52)	
LEVER*IND	0.0004	0.00005	-0.015**	-0.0002	0.0005	0.00001
	(0.13)		(-2.53)		(0.16)	
PROF	0.624**	0.078	0.516	0.006	0.625**	0.077
	(2.28)		(1.41)		(2.28)	
PROF*IND	-0.008	-0.001	-0.015	-0.0001	-0.008	-0.001
	(-1.03)		(-1.28)		(-1.02)	
LIQUID	0.262**	0.033	-0.470***	-0.006	0.260**	0.032
	(2.28)		(-2.65)		(2.27)	
LIQUID*IND	-0.008**	-0.001	-0.002	-0.0002	-0.007**	-0.0009
	(-2.04)		(-0.43)		(-2.05)	
COLL	1.299***	0.161	4.080***	0.050	1.31***	0.163
	(3.22)		(7.02)		(3.26)	
COLL*IND	-0.031**	-0.004	-0.087***	-0.001	-0.031**	-0.004
	(-2.23)		(-4.65)		(-2.28)	
IND	0.074***	0.009	0.088***	0.001	0.074***	0.009
	(7.25)		(6.33)		(7.29)	
REP=PREV.ISSUE			3.085***	0.438		
			(48.97)			
REP=RATING					0.846***	0.184
					(2.68)	
Observations	26074		26074		26074	
R^2	0.21		0.66		0.23	

Notes: The Table reports the effects of the variables listed on the probability to issue bonds by a probit model. IND is a variable measuring MARKET SIZE based on the size of local currency bond obligations as a percentage of nominal GDP. Time dummies, industry dummies and country dummies are included in the models. Also see notes to Table 2.

Table 5: Sample splits

	Market		Liquidity									
	1995-2002		2003-2007		1995-2002		2003-2007		1995-2002		2003-2007	
	Coeff.	M.E	Coeff.	M.E	Coeff.	M.E	Coeff.	M.E	Coeff.	M.E	Coeff.	M.E
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SIZE	0.314***	0.049	0.363***	0.048	0.247***	0.007	0.297***	0.004	0.314***	0.048	0.363***	0.047
	(9.15)		(23.54)		(10.2)		(13.8)		(9.14)		(23.52)	
SIZE*IND	0.00001	0.000	0.00004	0.000	0.0001	0.000	-0.000	-0.000	0.00001	0.000	0.000	0.000
	(0.38)		(1.00)		(0.21)		(-0.51)		(0.34)		(0.94)	
GROWTH	0.162***	0.025	0.026	0.003	0.047	0.001	0.090	0.001	0.157***	0.000	0.024	0.003
	(3.31)		(0.39)		(0.54)		(0.97)		(3.26)		(0.36)	
GROWTH*IND	0.0001	0.00002	-0.0002	-0.0001	0.0001	0.000	-0.000	-0.000	0.0001	0.000	-0.0002	-0.00003
	(0.29)		(-0.62)		(0.19)		(-0.048)		(0.33)		(-0.61)	
YEARS	-0.003	-0.001	-0.011*	-0.001	-0.020**	-0.001	0.003	0.000	-0.003	-0.0005	-0.011**	-0.001
	(-0.32)		(-1.92)		(-2.45)		(0.35)		(-0.32)		(-1.94)	
YEARS*IND	-0.00001	-0.000	0.0003	0.0002	-0.0002***	-0.0001	-0.0001***	-0.0001	-0.000	-0.000	0.0001*	0.00001
	(-0.38)		(1.75)		(-2.98)		(-4.32)		(0.38)		(1.75)	
LEVER	0.471***	0.073	0.896***	0.118	0.076	0.002	0.351	0.005	0.472	0.073	0.890***	0.117
	(2.75)		(7.92)		(0.48)		(1.64)		(2.75)		(7.89)	
LEVER*IND	0.001	0.00002	0.001	0.00001	0.001	0.0002	0.002	0.0002	0.001	0.00001	0.001	0.0001
	(1.26)		(1.13)		(0.59)		(1.51)		(1.25)		(1.17)	
PROF	0.513*	0.080	0.603**	0.079	0.360	0.010	0.075	0.001	0.517*	0.081	0.592**	0.078
	(1.82)		(2.02)		(1.29)		(0.16)		(1.83)		(2.00)	
PROF*IND	-0.001	-0.0002	-0.004**	-0.001	-0.001	-0.0005	-0.003	-0.0002	-0.001	-0.00001	-0.004	-0.0005
	(-0.88)		(-2.29)		(-0.57)		(-1.20)		(-0.89)		(-2.27)	
LIQUID	0.322	0.050	0.048	0.006	-0.201	-0.005	-0.834***	-0.012	0.314	0.049	0.042	0.005
	(1.51)		(0.38)		(-1.13)		(-4.00)		(1.47)		(0.34)	
LIQUID*IND	-0.002**	-0.0003	-0.002**	-0.0003	-0.001	-0.0001	-0.001	-0.0001	-0.002**	-0.0003	-0.001**	-0.0002
	(-2.19)		(-2.02)		(-0.99)		(-0.79)		(-2.18)		(-1.97)	
COLL	-0.615	-0.096	0.743*	0.098	1.962***	0.053	2.889***	0.041	-0.614	-0.09	0.733*	0.096
	(-0.80)		(1.75)		(3.19)		(4.33)		(-0.80)		(1.72)	
COLL*IND	0.005	0.001	0.004	0.0001	-0.007	-0.0003	-0.010*	-0.0001	0.055	0.00008	0.003	0.0004
	(0.88)		(1.26)		(-1.16)		(-1.91)		(0.88)		(1.28)	
IND	0.00003	0.000	0.001	0.00002	0.002*	0.0001	0.003***	0.0002	0.00004	0.00001	0.006	0.00008
	(0.07)		(0.94)		(1.81)		(2.74)		(0.08)		(0.94)	
REP=PREV.ISSUE					2.986***	0.495	3.070***	0.443				
					(32.1)		(36.0)					
REP=RATING									0.038	0.05	0.753*	0.163
									(0.11)		(1.71)	
Observations	8810		10724		8810		10724		8810		10724	
R-squared	0.22		0.22		0.64		0.65		0.22		0.23	

Tests of equality	p-value
SIZE	0.28
LEVER	0.14
LIQUID	0.00
COLL	0.09
IND	0.23
REP=PREV.ISSUE	0.05

Notes: The Table reports the effects of the variables listed on the probability to issue bonds by a probit model. *IND* is a variable measuring MARKET LIQUIDITY

based on the extent of trading in the secondary market relative to the amount of bonds outstanding. Time dummies, industry dummies and country dummies are included in the models. Also see notes to Table 2.

Table 6: Sample splits

	Market		Size									
	1995-2002		2003-2007		1995-2002		2003-2007		1995-2002		2003-2007	
	Coeff.	M.E	Coeff.	M.E	Coeff.	M.E	Coeff.	M.E	Coeff.	M.E	Coeff.	M.E
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SIZE	0.452***	0.057	0.514***	0.060	0.417***	0.005	0.378***	0.004	0.451***	0.057	0.511***	0.061
	(18.69)		(17.98)		(7.74)		(5.94)		(18.65)		(17.91)	
SIZE*IND	-0.004***	-0.0003	-0.005***	-0.001	-0.004***	-0.0003	-0.003	-0.0002	-0.004***	-0.0004	-0.005***	-0.0005
	(-5.49)		(-5.39)		(-3.48)		(-1.44)		(-5.59)		(-5.31)	
GROWTH	0.102	0.013	0.259*	0.030	0.178*	0.002	0.226	0.003	0.100	0.012	0.257*	0.031
	(1.18)		(1.82)		(1.71)		(1.32)		(1.17)		(1.81)	
GROWTH*IND	0.001	0.0002	-0.009*	-0.001	-0.004	-0.0002	-0.005	-0.0003	0.0008	0.0001	-0.009*	-0.001
	(0.32)		(-1.92)		(-0.89)		(-0.85)		(0.34)		(1.91)	
YEARS	0.011	0.001	-0.004	-0.00002	0.015	0.0001	-0.011	-0.0001	0.011	0.001	-0.003	-0.0004
	(1.34)		(-0.44)		(0.68)		(-0.52)		(1.40)		(-0.43)	
YEARS*IND	-0.0002*	-0.0002	-0.00001	-0.000	-0.002**	-0.0001	-0.001	-0.0002	-0.004**	-0.00006	-0.00004	-0.000
	(-1.91)		(-0.22)		(-2.36)		(-0.92)		(-1.93)		(-0.24)	
LEVER	0.485***	0.061	0.814***	0.096	0.602*	0.007	1.125**	0.013	0.484***	0.061	0.816***	0.095
	(3.28)		(4.66)		(1.72)		(2.27)		(3.27)		(4.68)	
LEVER*IND	0.001	0.00003	0.007	0.001	-0.015	-0.0001	-0.014	-0.0001	0.001	0.00001	0.006	0.0007
	(0.20)		(1.14)		(-1.52)		(-0.90)		(0.25)		(1.11)	
PROF	0.885***	0.112	-0.038	-0.004	0.883	0.010	-0.129	-0.001	0.880***	0.111	-0.022	-0.002
	(2.80)		(-0.08)		(1.47)		(-0.15)		(2.79)		(-0.05)	
PROF*IND	-0.013	-0.002	0.006	0.001	-0.023	-0.0003	-0.002	-0.0001	-0.012	-0.001	0.005	0.0006
	(-1.39)		(0.42)		(-1.34)		(-0.066)		(-1.35)		(0.37)	
LIQUID	0.530***	0.067	-0.113	-0.013	-0.132	-0.002	-0.801*	-0.009	0.528***	0.066	-0111	-0.013
	(3.63)		(-0.59)		(-0.31)		(-1.68)		(3.61)		(-0.58)	
LIQUID*IND	-0.011**	-0.001	0.001	0.0002	-0.004	-0.0003	0.000	0.000	-0.010**	-0.001	0.0009	0.0001
	(-2.31)		(0.18)		(-0.33)		(0.030)		(-2.30)		(0.16)	
COLL	1.183*	0.150	0.932*	0.109	4.493***	0.052	3.377*	0.038	1.22**	0.154	0.942*	0.110
	(1.88)		(1.72)		(2.89)		(1.93)		(1.95)		(1.76)	
COLL*IND	-0.044**	-0.006	-0.002	-0.0002	-0.101**	-0.001	-0.055	-0.001	-0.045**	-0.057	-0.002	-0.0002
	(-2.01)		(-0.11)		(-2.22)		(-1.04)		(-2.08)		(-0.14)	
IND	0.069***	0.009	0.094***	0.011	0.096***	0.001	0.074**	0.001	0.070***	0.009	0.093***	0.109
	(5.11)		(5.05)		(3.70)		(2.03)		(5.18)		(5.01)	
REP=PREV.ISSUE					3.080***	0.443	3.142***	0.426				
					(17.6)		(16.4)					
REP=RATING									0.852*	0.179	0.852**	0.188
									(1.73)		(2.01)	
Observations	12434		13607		12434		13607		12434		13607	
R-squared	0.21		0.21		0.67		0.66		0.24		0.24	
Tests of equality						p-value						
SIZE						0.31						
LEVER						0.19						

LIQUID	0.09
COLL	0.31
IND	0.26
REP=PREV.ISSUE	0.40

Notes: The Table reports the effects of the variables listed on the probability to issue bonds by a probit model. IND is a variable measuring MARKET SIZE based on the size of local currency bond obligations as a percentage of nominal GDP. Time dummies, industry dummies and country dummies are included in the models. Also see notes to Table 2.