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# Capital structure and the issuance of corporate bonds in emerging Asia<sup>1</sup>

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## Abstract

In emerging Asia's local-currency bond market, the government bond segments have largely come of age while the corporate bond markets have remained immature. This paper focuses on the question of what drives corporate bond issuance, an issue of great practical relevance for policymakers in the region. We analyse the financing decisions of some 4,600 firms in eight countries in emerging Asia. We analyse these decisions within the context of the firms' capital structure. We also analyse the effect of market depth, relying on market-wide indicators from the BIS. We find that for both seasoned and unseasoned issuers, size and leverage both matter for the decision to issue. The availability of tangible assets matters for the decision to issue in foreign currency. At the level of the markets, the depth of the market and interest differentials matter.

Key words: bond financing, capital structure, emerging markets, Asian bond markets

JEL: C23, E44, F32, F34, G32, O16

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# 1 Introduction

What drives the issuance of local-currency bonds? This question has been prominent in the minds of policymakers in the emerging economies of Asia. In 2005, the finance ministers of the ASEAN+3 countries met in Madrid and launched a new roadmap for developing local-currency bond markets under the Asian Bond Markets Initiative (ABMI). The roadmap identified four critical areas: (i) promoting the issuance of local-currency bonds; (ii) fostering demand for these bonds; (iii) improving the regulatory framework; and (iv) improving the infrastructure. This paper is about the first of these critical areas, that of increasing the issuance of local-currency bonds.

? has recently assessed the progress made under the new ABMI roadmap. She points out that the authorities in the region have encouraged bond issuance by state-owned firms, including financial institutions, utilities and airlines. By 2011, the Chinese policy banks accounted for 31% of China's outstanding local-currency bonds. Throughout the ASEAN+3 countries, multilateral development banks have been allowed to issue in local currencies, most notably in Malaysia and Thailand. Until the subprime mortgage crisis in 2008, there had also been some progress in the securitization of mortgages and consumer finance. Notably absent in all these developments has been the corporate bond market.

A second major initiative for bond markets in Asia has been the Asian Bond Fund 2 (ABF2). Here the initiative focused only on promoting local-currency government bond markets in the region. The initiative was driven by central banks rather than finance ministries. The central banks involved were those belonging to the Executive Meeting of East Asia and the Pacific (EMEAP), which includes the five larger ASEAN countries. The ABF2 was launched in 2005, almost at the same time as the new ABMI roadmap, with an initial investment of USD2 billion. The money was invested in eight local-currency government bond markets. The fund has since grown to about USD5 billion. In their assessment of this initiative, Packer and Remolona (2005) show that the local-currency government bond markets in the fund made impressive strides since the fund's inception, in part because of

the removal of cross-border restrictions. The ABF2 played an "important catalytic role" in these market reforms.

Unlike the ABF2's clear focus on just the government bond markets, the new ABMI roadmap identifies its four critical areas without making a clear distinction between government bonds and corporate bonds. Yet, as suggested by Packer and Remolona, the government bond markets in the larger ASEAN countries -in Indonesia, Malaysia, the Philippines, Thailand and Singapore -have already achieved the depth and liquidity that they need to play their appropriate economic roles, such as allowing market-based financing for the government and providing a benchmark yield curve. In these places, it is mainly the corporate bond markets that have remained small and inadequate, stuck in illiquid pockets of the local-currency bond markets. For policy purposes, the question of how to increase local-currency bond issuance is really a question largely for the corporate bond markets.

In this paper, we focus first of all on the relevant policy question of what drives corporate bond issuance in emerging Asia. To shed light on this question, we analyse the financing decisions of over 4,600 firms in eight Asian economies -China, Hong Kong, Indonesia, South Korea, Malaysia, the Philippines, Singapore and Thailand. These eight are also the ones in which the ABF2 invested in local-currency government bond markets. We analyse firm-level financing decisions using a Probit model and assess the importance of firm characteristics for the decision to seek bond finance in local-currency and foreign-currency bonds.<sup>1</sup> We find that the firm size, growth rate, leverage and profitability are all positive influences on the decision firms make to obtain bond finance. We also distinguish between seasoned issuers and unseasoned issuers, and find seasoned issuers are more sensitive to firm characteristics than unseasoned issuers, suggesting that improvements on their balance sheet as well as greater size and growth greatly increase the probability of issuance. To take account of the varying degrees of market development across the region and over time, we draw on a BIS data set that includes dynamic indicators of market depth based on the Bank for

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<sup>1</sup>In a separate paper we explore in more depth the decision to issue in onshore and offshore markets (see Mizen et al 2012).

International Settlements (BIS) international banking, securities and derivatives statistics. These include indicators of the ability to hedge currency exposures, as well as the access of foreign investors.

The paper also considers the capital structure of the firm. We measure the ratio of foreign currency bonds outstanding to total liabilities, and making use of a Tobit regression technique to control for left censored observations (zeros in the dependent variable) we demonstrate that firm-specific and market development variables influence capital structure. The results provide support for market depth, agency, static trade off and risk management theories, consistent with our earlier work (see Mizen et al. (2012)). When we allow for an ABF2/ABMI effects on capital structure we find this is supportive of the market depth hypothesis as the mechanism by which these reforms have influenced corporate capital structure.

The rest of the paper is organized as follows. Section 2 discusses the literature on capital structure theories. In section 3 we describe the data sources used in this study. Section 4 then gives an extended review of the data characteristics over the period since the Asian crisis. Section 5 reports the an econometric evaluation of the impact of firm characteristics and market developments for corporate capital structure in Asia. Section 6 draws together the conclusions of the paper and offers an extended policy discussion.

## 2 Literature review on capital structure

The financial theory of capital structure, which does not directly address the bond issuance decision, still offers insights into why corporations would issue bonds and what type of bonds they would be. The literature on optimal capital structure of the firm (c.f. ?; ?; ?), generally applies to both advanced and emerging economies. In the following we will briefly review the relevant literature on capital structure and the implications of different theories for the decision to issue corporate bonds, both in domestic or foreign currency.

## 2.1 Capital structure and the bond issuance decision

**Pecking order.** ? argue that firms may prefer to access internal finance before external finance, and will generally exhaust the opportunities in the preferred source before extending to other sources further down the pecking order. Firms with strong earnings and profitability are less likely to need to access external markets. Recently, ? posited a pecking order for foreign and domestic currency debt, arguing that foreign currency debt complements domestic currency debt since firms use the former only after exhausting the latter; and that firms with foreign listings for equity issuance (even lower down the pecking order) are likely to have obtained as much debt as they desire.

**Market depth.** This argument that the capital structure of firms may be influenced by the depth and liquidity of markets is particularly relevant to emerging financial markets, where depth and liquidity are often not as great as in advanced markets. ? and? suggest that Asian firms tend to experience lack of depth for large bond issues, and having exhausted the possibilities in local markets they issue in foreign markets. This may also explain why longer-term debt issuers use foreign markets. It may also explain why some Asian borrowers have tended to rely more on banks than bond markets.

**Static trade-offs.** Firms increase total debt, as well as local and foreign debt, in response to cost advantages. These can be due to tax treatment (Newberry (1998); Newberry and Dhaliwal (2001)); the level of interest rates, which can result in "cliente effects"(?); interest differentials between domestic and foreign markets as discussed above (see ?; ?; ?; ?); and cost differentials can also reflect the swaps, options and derivatives markets used to hedge foreign earnings for example (see ?).

**Agency costs.** The need for monitoring raises the cost of borrowing externally, but this may be mitigated by collateral assets (e.g. ? and ?), and signaling through greater information provision (often associated with firms of greater size) and access to high-quality lenders and markets (see ?; ?). Relationships with a preferred lender can also influence the choice of capital structure as explained by ?. The agency costs of debt can explain why

larger, more profitable and less risky firms may obtain better terms and be more likely to issue.

**Risk management.** Corporations may have incentives to adjust capital structure to reflect the source of their earnings or to hedge against foreign currency exposure. A stream of foreign earnings may induce the firm to issue in foreign currency, in order that it can use the earnings to service the debt. Management of FX risks can occur more effectively if there is a well developed derivatives market (see ?; ?).

The application of the above-cited capital structure theories to the decision to issue in different currencies comes down to the question of preferences between markets due to a pecking order, costs or convenience due to the development of respective markets, the costs of issuance due to static trade-offs or agency costs, or the desire to offset exchange rate risks for risk management purposes. In practice it is easier to measure the costs of issuance and the indicators of market development than it is to identify the preferences between markets in terms of a pecking order. Evidence of substitution between alternative sources of funding can provide an indication of the pecking order of finance, but it is hard to isolate the pecking order theory from theories that focus on the costs of issue, since the pecking order is established by the relative cost of obtaining finance from different sources.

In the literature, the static trade-off theory has perhaps been tested the most. The costs of issue are closely related to short-term interest rates and the differentials between rates for currency pairs. Using the short-term interest differentials as a proxy for the advantage of opportunity to issue cheaply in local currency has parallels in earlier work by ?, ? and ?. Their analysis points to financially sophisticated corporations taking advantage of market windows of opportunity in overseas currencies - i.e. deviations from covered interest parity - to issue and then swap the obligations back into the domestic currency.<sup>2</sup> While ? restrict their analysis to sovereign and agency issuers that have no foreign currency cash flows to hedge, ? find the level of foreign interest rates to be an important factor in their survey of

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<sup>2</sup>The analysis of such profitable financing opportunities for firms in global markets goes back to ?, who posit "cliente effects" that only a limited supply of firms can take advantage of in any period.

firms issuing foreign bonds. ? also finds that interest rate differentials matter for the decision to issue, suggesting a persistent role for uncovered returns. ? consider the opportunities that arise from covered and uncovered interest parity deviations, across a range of major currencies in the period 1999-2008. They find that the scope for uncovered interest cost savings is a significant influence on the choice of issuing currency, as is the fact that a currency has low nominal rates. The phenomenon is not dependent on the maturity of the issue, but does appear to be stronger for some types of issuers such as financial issuers. A paper focusing only on firms in Australia, Hong Kong, Korea, Japan and Singapore finds that firms take advantage of deviations from covered interest parity in long-term swap markets (?).

## 2.2 Measures of market development

Our own interest in this paper lies in exploring the influence of market development on capital structure of the firm, which is influenced indirectly by the decision to seek bond finance. The measures of market development have tended to focus on the most readily measured indicators such as market size and turnover. ?, and many other studies, use market size and turnover as measures of market development. A major focus of the BIS report was on the determinants of liquidity, and on the policies that could enhance liquidity (?). Time-varying policies, such as the Asian Bond Market Initiative or ABF2, designed to increase market liquidity and turnover in bond markets have also been taken into account in some studies (?, ? and ?). Development of the government bond market may also provide a "benchmark effect" that facilitates the pricing of bonds for corporate borrowers.<sup>3</sup> ? thus include measures of duration in government bond markets as an explanatory variable, noting that the choice of currency for long-duration bond issuance can depend on the existence of long government duration in the same currency.

In this paper we intend to broaden our definition of market development to include wider indicators of market depth. The first of these is the size of the foreign investor base.

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<sup>3</sup>At the same time, it may be possible for just certain key parts of the yield curve to be populated for effective pricing to occur (?).



The decision to issue in foreign currency or abroad is often affected by the desire to widen the investor base to include foreign investors. Thus the extent to which domestic markets are open to foreign investment is a critical factor in the domestic vs. offshore bond issuance decision. That withholding taxes are often a significant deterrent to investing in local markets for foreign investors, and thus can hinder the depth and liquidity of those markets, has been greatly emphasized by market participants in Asia (see ?). Similarly, the same report identifies restrictions on foreign investors investing in domestic bonds as a further area for market development. Where countries impede cross-border investment, they will enhance the offshore market. These factors are relevant to the static trade-off and the risk management theories as well as the market depth hypothesis, therefore we consider how the tax incentives for foreign investors affect the depth of the market, and its development. ? document that countries in Asia have varied the application of withholding taxes over time, and this potentially has an influence on the attractiveness of local currency bonds to foreign investors.

Another measure we use to indicate market development is the scale of the derivatives market. The development of FX markets and derivatives in EMEs usually depends on the depth and liquidity of local debt markets as a proxy measure for the ability to swap easily in and out of the domestic and other currencies and has also been used as a market-specific factor that might determine the extent of bond issuance.<sup>4</sup> To the extent that firms can transform their interest payments on foreign (or domestic) bond issues into synthetic domestic (foreign) payments that can be serviced by domestic (foreign) cash flows, better developed swaps and derivatives markets could in principal enhance the growth of both foreign currency and domestic currency bond issues. Firms might ordinarily attempt to avoid currency mismatch by issuing debt in currencies in which they receive an income stream, but sufficient scale in the swap market may allow firms to transform their interest payments or their income into the home (foreign) currency (see ?; ?). Interestingly, ? find that in emerging economies lack of local currency debt in derivatives markets is not intrinsic

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<sup>4</sup>The degree to which risks in operating through swap and FX markets, such as currency risk, interest rate risk, replacement risk and rollover risk, can affect the issuance decision has also been examined by ?.

to EMEs but is related to macroeconomic policies and conditions and also the size of the investor base.

Whether these markets support foreign currency relative to domestic currency issuance is ultimately an empirical question. ? find that the likelihood of using derivatives instruments is positively related to the exposure to FX risk and to the use of foreign currency debt. ? find that large multinationals are indifferent as to whether use is made of foreign currency bonds or of instruments to create synthetic foreign currency positions. ? find that US firms use actual debt and derivatives to hedge themselves against currency risk, while ? find that forwards and options are used as short-term complements to foreign bond issuance, but swaps are used as substitutes. The use of this measure is possible due to the availability of detailed BIS statistics on the daily average turnover in the Triennial Survey by country, currency and reporting counterparty.

The institutional characteristics of the jurisdiction of the bond market can also affect the degree of issuance in that market. Many papers (e.g. ?; ?; ?; ?) examine the impact of accounting standards, legal standards, political-macro risk, tax regime and creditor rights on bond market development as well as quantity of issuance - as these qualitative factors are naturally expected to influence the costs of borrowing and issuing bonds. These characteristics vary very slowly over time and are highly correlated with other market characteristics discussed above.

In the sections that follow, we will examine the significance of these market variables to establish support for the market depth hypothesis as well as other theories of capital structure outlined in this section and to understand the firm-level decision to issue in different currencies. The next section describes the data and the construction of variables in further detail.

### 3 Data

Our data are drawn from the bond issues, balance sheet and profit and loss information provided at the firm level for eight Asian economies. This sets our study apart from the majority of studies that do not use firm-level data. We use Bloomberg to identify all corporate bonds issued by firms in China, Hong Kong SAR, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand over the time period 1995 through 2007; we gather information about the issue dates, denomination, currency, location and maturity of the bonds measured.<sup>5</sup> Our coverage of bond issues therefore embraces 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 misrepresenting the scale of corporate bond issuance.

The Thomson Financial Primark database offers balance sheet and profit and loss account data for firms in the East Asian region. Our initial sample 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. Our chosen variables are determined by the findings in the previous literature. To control for size ( $SIZE_{it}$ ), we calculate the logarithm of the firm's total assets consistent with ?. We also measure investment over total assets ( $INV_{Ait}$ ) to capture the expansion of the firm, and the greater need for finance. We consider four dimensions of financial health from the balance sheet: leverage ( $LEV_{ERit}$ ), profitability ( $PROF_{it}$ ), liquidity ( $LIQUID_{it}$ ), and collateral assets in total assets ( $COLL_{it}$ ). Leverage is measured as total debt over total assets indicating the firm's overall indebtedness used previously by ?, ?, ? and ?. Profitability

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<sup>5</sup>Our definition of corporate bonds is in line with recent studies on Asian bond markets (see ?) and includes all non-government long-term issues in a given currency. Characteristics of the specific bonds themselves are also used in a number of studies (e.g. ?), such as the issue size, credit quality, sector, maturity, coupons, and whether there are single or multiple issues. For example, ? find that firms in Australia, Hong Kong SAR, Korea, Japan and Singapore tend to issue abroad when the bonds are lower-rated by the rating agencies.

ratio is defined as earnings before interest and taxes relative to total assets to measure a firm's ability to generate profits, and used previously by ?. The liquidity ratio is measured by current assets over total liabilities, and has been used in earlier studies such as ? as an indicator of the available liquid resources within the firm. We include a measure of tangible assets which proxies for the firm's ability to pledge collateral for debt finance, measured as tangible assets over total assets, and used previously by ?, ? and ? to explain debt composition.

We include a set of market variables to capture the impact of market characteristics on the probability of bond issuance, drawn from the statistics of the Bank for International Settlements. First of all, we measure the size of the bond using the amount of total debt securities outstanding in US\$bn at the end of each year in both domestic (DDS) and international (IDS) markets following Black and Munro (2010). ?, ?, ? and ? also account for size of the bond market. We form a ratio of the total debt securities to GDP to indicate scale or market depth (*DEBTSEC3t*).

We measure the scale of the onshore market in the following way. We employ the ratio of debt securities issued onshore to debt securities issued both onshore and offshore (*ONSRATIO3t*), which is a relative measure of the scale of the onshore market; offshore issues are defined as total international debt securities minus domestic debt securities. All data are taken from the BIS statistics. The definitions of these variables are consistent with ?.

To measure the incentives to issue, we use short-term interest differentials (*SID3t*) as measures of the uncovered differential creating opportunistic reasons to issue in foreign currency following Graham and Harvey (2001), ?, ? and ?. SID is measured as the short-interest differential between the annual averages of local and the US nominal rates (LCY - US) on bonds of 3-12 month maturity in percentage points.<sup>6</sup>

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<sup>6</sup>Other authors use a long interest differential on annual average of yields on bonds of 5-10 year maturity in percentage points. We experimented with this variable, but found the short interest differential to be consistently more important.

To measure investor demand, we use the IMF Coordinated Portfolio Investment Survey (CPIS) to 2001 and International Investment Position (IIP) before 2001 to give the foreign holdings of debt securities in US\$m, which we then use to form a ratio of investor demand to GDP ( $CPIS-IIP_{jt}$ ). Investor demand can also be significantly influenced by tax treatment, so we define a dummy for withholding tax ( $WITHTAX_{jt}$ ) on foreign investors' holdings of local currency government bonds that is defined for each country and year, drawn from?

To measure the scale of the foreign exchange swaps, derivatives and options market in each country from the BIS Triennial Survey, we use the sum of currency swaps, FX swaps, options, outright forwards and other derivatives based on the daily average turnover in April, by location of the counterparty, currency and reporting country to provide an indicator of the scale of the derivatives market ( $DERIV_{jt}$ ). We interpolate the intervening years using a semi-annual survey conducted by the BIS.

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 to have at least three 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 SAR, 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 Analysing the data

By way of preliminary analysis we show the evolution of debt securities in Figure 1. Total debt securities outstanding in the EMEAP region excluding Australia, New Zealand and

Japan, amounted to less than \$300bn in 1992, but by 2010 the total debt securities outstanding were over \$2.5tn. The five-fold increase in the size of the corporate bond market, is due primarily to the expansion of domestic debt securities, although there has been an upward trend in international debt securities.

Figure 2 shows the currency breakdown of international debt securities into local currency and foreign currency components. Foreign currency bonds dominate, making up over 90% of the bonds outstanding before 2000. But from the 1997 Asian crisis the amount of local currency bonds outstanding begin to increase, and the share of the total rises from 2% to 12% after six years.

Tables 1 and 2 report summary statistics. In Table 1 we show the means and medians for the firm-specific explanatory variables; these are reported for all firms, and then for issuers and non-issuers. We report p-values from a test of equality of the means for the different types of issuers, which has a null of equality. Table 1 reveals that issuing firms are significantly larger and have greater investment needs than non-issuing firms. In addition, we show that bond issuers are more leveraged, less liquid and marginally less well collateralized than non issuers. Surprisingly they are not more profitable, however. These statistics are in line with ?.

In Table 2 we present the same information as well as market development indicators broken out into individual countries. Table 2 shows the differences between firm level and institutional variables across countries. The variables LCY and FCY show that there are substantial variations in firm-level issue size across countries in local and foreign bond markets. Chinese firms make large issues, while Indonesian firms make small issues, and firms in Malaysia and the Philippines make smaller issues in local currency compared to foreign currency issues. These features do not reflect the scale of the bond markets in these countries, just the average issue size for firms in those countries. Firms can and do make multiple issues of bonds in any one year, and we aggregate these up to consider the total volume issued each year for every firm. In general, Indonesian and Korean firms have the largest

amount of total debt, followed by the Philippines and Thailand, which is consistent with the scale of firm assets in these countries. This also explains why firms in these countries have such small ratios of foreign currency bonds outstanding compared with total liabilities (FCY/TL), because the large firms in these countries have large debt levels and small amounts of foreign currency bonds outstanding. As ? point out, lack of market depth is one explanation for the high use of domestic and foreign currency debt not obtained through the bond market, reflected in the low values of these ratios in Table 3. We will use the FCY/TL ratio to explore capital structure directly.

Turning to the characteristics of the firms, Indonesian and Korean firms are larger, while Malaysian and Singaporean firms are smaller, which may reflect the combined effect of the size of their domestic markets and their export orientation; Chinese, Korean and Thai firms had the highest investment to total asset ratios, and Malaysia and the Philippines had the lowest ratios. Indonesian and Thai firms were the most levered, but firms in Hong Kong SAR and Singapore were less levered, reflecting the higher levels of equity rather than the lower level of debt for firms in these countries

Finally, our information on market size, liquidity and ability to hedge is informative about the differences between countries in our panel. The measure of all debt securities to GDP (DEBTSEC) shows that all Asian countries in our sample have small bond markets relative to GDP but the Chinese market is very small indeed. In relative terms, China and Korea have large onshore markets and smaller offshore markets for debt, and similarly Malaysia has a large onshore market (due to the scale of its Islamic bond market), but Hong Kong SAR has a large offshore market relative to the onshore market, as does the Philippines. Other variables reflect idiosyncratic features such as the different interest rates, investor participation and tax treatment in the countries we study.

An important issue for our paper is the evolution over time of the firms in our sample, and the markets. Table 3 presents mean values for two sub-samples 1995-2003 and 2004-2007. The data show that firms became significantly larger, and more profitable, and more

collateralized between these two periods; they also became less levered and invested less heavily. This is evidence of the growth in Asian corporations over the period, but caution over debt levels reveals firms were inclined to use fewer borrowed resources, partly because investment declined, but also because internal resources were used in preference to bank loans (?).

Market development variables show rapid growth in foreign currency bonds outstanding and local currency bonds outstanding, the averages between the two periods are significantly different, and much higher in the second period, as figures 1 and 2 illustrated. The ratio of foreign currency to total liabilities did not rise significantly, indicating that both numerator and denominator increased at a similar pace. The ratio of onshore total debt securities outstanding (ONSRATIO) rose significantly, foreign investor participation (CPIS-IIP) rose, and derivatives market s expanded (DERIV), while the cost of issue (SID) fell, and stock market turnover declined (STOCKTVR).

We turn now to the question whether these developments at the firm level and in the markets influenced the capital structure of the firms in the region.

## 5 Empirical results

Before we consider the question of capital structure and the influence of firms' financial health, market development and the ABF initiative on this structure, we first ask how these variables influence the decision to issue bonds in the Asian region.

### 5.1 Bond issuance

We determine the probability that a firm will opt for bond finance in a given year based on our chosen explanatory variables, using a Probit model of the form:

$$Pr(BF_{ijt} = 1) = F(a_0 + \chi_{ijt}\beta_1 + z_{jt}\gamma + \sim_{ijt})$$



We define the dependent variable,  $BF_{ijt}$ , as a dummy variable that equals 1 if firm  $i$  issued a bond in domestic or foreign markets, in country  $j$ , in year  $t$ , and zero otherwise. Our specification includes firm-specific regressors,  $x_{ijt}$ , following ?, for firm size, growth of sales, years quoted in the stock market, leverage, long-term debt, profitability, liquid assets and collateral, all defined in the data section. These variables indicate the tendency for the firm to seek bond finance, and its ability to overcome any obstacles such as agency problems, through the strength of its balance sheet.

In Table 4 we report the influence of the firm-balance sheet variables added one by one, and we observe two features. First, the variables are on the whole highly significant determinants of the decision to opt for bond finance. Most variables have coefficients that reject the null of a zero value at the 1% level. Second, the coefficient values are of the expected sign in all cases, and are stable when additional variables are added to the Probit model. Hence we find that size, which is a good proxy for the ability to overcome information asymmetries, has a positive effect on the decision to seek bond finance c.f. ?. Larger firms are typically better placed to obtain market finance because they have name recognition, may well be listed with more detailed published accounts, and a longer track record. We also find that firms with a faster growth rate i.e. faster expansion rate measured by investment over total assets (INVA), have a greater need for finance and better prospects than firms that are growing more slowly, or not at all (see ? and ?), the coefficient on INVA is positive and significant.

The financial health also determines whether a firm can obtain bond finance as noted by ?, ?, ? and ?. We consider leverage, profitability, and liquidity in total assets as indicators of creditworthiness on the balance sheet. While high leverage can be associated with high debt, it can also be a signal of good credit standing and an indicator of a growing business (see ?, ?, ?). Similarly, a more profitable firm is one that is more likely to obtain market finance than a less profitable one. We find the coefficients on LEVER and PROF are both positive and strongly significant, confirming creditworthiness influences access to bond finance. However,

we do not find any evidence that liquidity matters. It is possible that profitability and liquidity are related, and having included a measure of profitability we would not expect to find a separate influence of liquid assets on access to market finance. In Table 5 the coefficient associated with the liquidity ratio (LIQUID) is insignificantly different from zero.

Finally, as a test of the agency theory of debt, we explore the importance of collateral assets as a reassurance for investors that there are tangible assets within the firm. This should positively influence access to bond finance even for unsecured bonds (see, for example, ?). However we find that the coefficient associated with collateral assets (COLL) is positive but insignificant, hence there is no support for the agency theory for Asian firms in our sample.

In Table 5 we consider whether firms that have a track record in the bond market have greater or lesser sensitivity to these variables than firms that have no track record of previous issuance. This was shown to be an important determinant of bond issuance in ?. We refer to the former types of firms as seasoned firms and the latter as unseasoned firms. We show that the probability to seek bond finance is much more sensitive to our firm-specific variables for seasoned issuers than for unseasoned variables since the coefficient values are much larger for seasoned firms. We are able to reject the null of equality for coefficients on size, investment over total assets and leverage, where in all these cases the seasoned firms show a larger response to an increase in these variables. Seasoned firms also have large point estimates of coefficients for profitability, but we cannot reject the null that the coefficients are equal for seasoned and unseasoned firms. For liquidity and collateral assets we also fail to reject the null, but in this case the coefficients are insignificant.

## 5.2 Capital structure

In this section we address the capital structure question, with reference to the ratio of foreign currency bonds outstanding to total liabilities, which has some similarity to the measures used by ? and ?. Our intention is to explore the significance of market variables in support of different capital structure theories. Our initial observations in the descriptive statistics

show that a low mean value for this ratio reveals some initial support for the market depth hypothesis, since debt issued in foreign bond markets is small in relation to firms' total liabilities.

We employ an empirical approach to identify the relationship between firm-specific indicators, market indicators and debt structure. A firm (indexed by  $i$ ) either issued bonds at time  $t$  or it does not issue bonds, but in this section we consider the scale of foreign currency issues relative to total liabilities. As in ?, we formulate a Tobit model of debt structure as

$$DS_{ijt} = \beta_0 + \beta_1 X_{ijt} + \beta_2 Z_{jt} + E_{ijt}$$

where  $DS_{ijt}$  denotes the debt structure variable defined as the ratio of foreign currency bonds to total liabilities of firm  $i$  in country  $j$  at time  $t$  ( $FCY/TL_{ijt}$ ). This is as a function of the vector of determinants of debt structure of a vector of firm-specific variables,  $X_{ijt}$ , and market-specific variables,  $Z_{jt}$ . We define the relationship between these variables with slope parameters given by the vectors  $\beta$  and  $\gamma$ , and a normally distributed error term  $E_{ijt}$ .

At the next stage, we augment the above baseline model with interaction terms with a time period dummy ABF, which takes the value one in years 2003 to 2007 and zero otherwise.

The choice of the explanatory variables is guided by the previous work on capital structure and access to financial markets. Following ? and ?, we include firm size, investment over assets, profitability, liquid assets and collateral, all defined in the data section. These variables indicate a predisposition of the firm to issue in bond markets, and its ability to overcome agency problems through the strength of its balance sheet. We also add two variables to allow for the influence of market-to-book valuation of the company, as a further measure of growth opportunities that may spur the firm to access foreign bond markets, and an indicator variable that shows the firm has accessed the foreign currency bond market previously.

We include a set of market development indicators,  $Z_{jt}$ , that allow for variation in debt market size, liquidity, relative scale of the onshore market, the foreign investor base, and the

ability to hedge through derivatives markets. We control also for market incentives based on tax treatment of investor returns, and other opportunistic features that may make bond issuance attractive. Our interest is in the coefficients,  $\beta_j$ , which reveal the sensitivity of the capital structure to market development.

While market development variables are still our main concern, we would now consider the relative advantage of issuing in foreign markets based on the uncovered interest differential (*SID3t*) to be more important compared with the previous model that included both domestic and foreign market issues. Similarly, higher withholding taxes (*WTHHTAX3t*) would be more likely to deter foreign holders of bonds issued in foreign markets, and we would expect to see a stronger effect in this model compared to the previous case, which included domestic and foreign markets. The scale of the onshore market (*ONSRATIO3t*) is also likely to be important, because it measures the incentives to issue in domestic markets.

### 5.2.1 Firm-specific characteristics

The first two columns of Table 6 report the influence of firm characteristics on debt structure. We find that larger firms in terms of total assets have a higher ratio of foreign currency bonds outstanding to total liabilities, this is to be expected since the *SIZE* is likely to make foreign currency issues more viable, and it is likely to give firms greater name recognition that foreign investors require. An examination of the issuers that only issued in foreign currency included Cathay Pacific and Hong Kong Mass Transit (Hong Kong SAR), Daewoo and Samsung Electronics (Korea) and Singapore Telephone (Singapore) all of which are large, and with high external visibility. Firms with higher collateral assets and those with lower profitability also have a higher ratio of foreign currency bonds outstanding to total liabilities. The positive sign on the *COLL* variable is consistent with the costly monitoring and agency theory, however, a negative and significant coefficient on profitability (*PROF*) is the opposite of the prediction of the pecking order theory, which argues that *domestic* bonds should fall relative to total liabilities as firms become more profitable. It is possible that

this reveals that more profitable firms increase total liabilities by more than foreign currency bonds outstanding. Other variables appear to have no influence on the capital structure.

### 5.2.2 Market indicators and debt structure

Columns 3 and 4 in Table 6 report the influence of market development variables after controlling for firm specific variables. The results in these columns show that the rise in the ratio of total debt securities to *GDP* (*DEBTSEC*) coincided with a reduction in the ratio of foreign currency bonds outstanding to total liabilities. This can be understood with reference to Figures 1 and 2, which show that the total debt securities outstanding have risen, while the proportion of local currency issues has also grown. This has had the effect of reducing the foreign currency bonds outstanding while the total debt securities increased. An increase in turnover in the stock market (*STOCKTVR*) reduced the ratio of foreign currency bonds to total liabilities, and the short interest differential (*SID*), and scale of foreign investor participation (*CPLS-IIS*) also have the expected effects. *SID* measures the static trade off from issuing in local versus foreign currency, and as it rises the advantages of local issuance decrease, making foreign issues more attractive. This should raise the ratio of foreign currency bonds outstanding to total liabilities. The *CPLS - IIP* variable has a positive effect on the dependent variable because when investor participation increases, there is an increase in the ratio of foreign currency bonds outstanding to total liabilities. In column 4 we replace *SID* with the withholding tax dummy (*WITHTAX*), which is significant and strongly negative since higher withholding taxes would be more likely to deter foreign holders of bonds issued in foreign markets. This confirms the support for the static trade-off theory.

We find that these results help confirm a number of theories of capital structure including market depth, agency, static trade off and risk management theories.

### **5.2.3 The effect of the ABF initiative on debt structure**

The final column in Table 6 reports the influence of an ABF dummy that takes a value of 1 after 2005, and is otherwise zero. The dummy is added to see if there has been a scale effect on the ratio of foreign currency bonds outstanding to total liabilities, and we find that there has been a small and significant positive increase in the ratio after the ABF2 fund was established. Most other variables retain their sign and significance when we add this variable, but the DEBTSEC and ONSRATIO variables lose their influence. This is indicative that the increase in the ratio due to the ABF programme was largely captured in previous specifications by the increase in market depth and the development of the onshore market. It indicates that the mechanism by which the ABF2 programme has influenced capital structure of firms in the EMEAP group is through fostering greater market depth in the onshore and offshore markets.

## **6 Policy conclusions**

An important policy goal of governments in emerging Asia has been the development of local currency corporate bond markets. Over the past decade, authorities in emerging Asian economies have launched a variety of projects to promote local currency bond markets. The most significant of these projects have been ABF2, involving 12 major central banks in the Asia-Pacific region, administered by the Bank for International Settlements (BIS), and the Asia Bond Markets Initiative (ABMI) of the ASEAN+3 governments. These projects have acted as catalysts for regulatory reforms and improvements in market practices and infrastructure in the region. Restrictions on the convertibility of local currency have in many cases been gradually dismantled, and in a number of jurisdictions they are under review. Local currencies have become more convertible over the past five years. Liberalisation of foreign exchange administration rules has facilitated hedging arrangements entered into by resident and non-resident investors. Meanwhile, the lowering of barriers to the development

of FX swaps or derivatives markets, which allows foreign borrowers wishing to convert foreign currency earnings into local currency to finance their projects in the home country, has been a boon to issuance in some local currency jurisdictions. Consequently, the size of the local currency markets has grown considerably.

The results have broad implications for various proposals under consideration for the development of corporate bond markets. Given that the market depth hypothesis is strongly confirmed for the decision to issue bonds, measures to improve the depth and liquidity in local bonds markets are likely to be effective in increasing issuance and size of the markets. More specifically, the rise in foreign investor participation has been shown to increase issuance. For those countries that still impose withholding taxes on bond interest and capital gains, one effective way to attract non-resident portfolio investors would be to lift these taxes, though this may on occasion conflict with the objective of mitigating destabilizing capital inflows. While these taxes are often considered to be important revenue measures, they are in fact revenue-neutral in the case of domestic investors (the government pays in higher interest rates what it collects in taxes) and serve only to dissuade non-resident investors. In China, while the domestic market is large, it can still benefit from the diversity provided by nonresident investors. Further liberalization of foreign exchange administration rules, including the removal of impediments to the development of FX swaps or derivatives markets that allow investors to hedge currency risk, would encourage the entry of non-resident investors in many other ABF2 jurisdictions as well.

The diversification of the issuer base will further improve market depth. Non-resident issuers of corporate bonds often require currency swaps to be able to switch from the currency in which they issue to the currency that they require for investment purposes. Promoting the development of currency swaps or derivatives markets to facilitate the ability of non-resident issuers to hedge currency risk would likely encourage greater bond issuance by this class of borrowers. The empirical evidence presented in this paper, as well as anecdotal evidence, indicate that the creation of swap and hedging markets is extremely helpful. Non-resident

issuers in the Australian dollar and New Zealand dollar markets, for example, rely heavily on currency swaps. At the same time, Asia has far fewer issuers of non-investment grade bonds than other countries. Barriers to the issuance of bonds by firms - both foreign and domestic - ranked at lower rating levels, which often take the form of simple rules, should be eased wherever feasible.

The importance of derivatives markets to bond market development also includes the trading of credit derivatives. Although the recent financial crisis has given credit default swaps (CDS) a bad name, a properly supervised market in such contracts has the potential to enhance liquidity and price discovery in the corporate bond market. China is already considering allowing such derivatives to be introduced. In October 2010, the National Association of Financial Market Institutional Investors announced a pilot operation for credit risk mitigation instruments in the interbank market. A healthy CDS market is likely to include an inter-dealer market, trading in CDS indices and a well capitalized clearing house.

The tests in this paper also suggest that market liquidity is important, and that policy-makers should foster market-making in corporate bonds. Dealers in fixed-income markets should be encouraged to make markets in corporate bonds that they themselves did not underwrite. One way to do this is to pre-qualify certain issues for trading in an inter-dealer market and perhaps even for eligibility as collateral in the repo market. The criteria for pre-qualification could include issue size, availability of a credit rating and adherence to a master agreement. In Europe, the MTS system has in a short period created a liquid corporate bond market through such a market-making and pre-qualification arrangement.

Enhancing the post-trade transparency in corporate bond trading would also be helpful in expanding market liquidity. While the ex-ante public revelation of price quote and trader information tends to hinder trading in fixed-income markets, the revelation of such information immediately after the trade has been shown to foster liquidity. In the United States, the Trade Reporting and Compliance Engine (TRACE) introduced in 2002 by the National Association of Securities Dealers has evidently bolstered liquidity in the secondary market



for corporate bonds by disseminating trade information quickly. In Malaysia, the Electronic Trading Platform (ETP) of Bank Negara Malaysia is another model for introducing real-time post-trade transparency.