Why do firms issue abroad? Lessons from onshore and offshore corporate bond finance in Asian emerging markets*

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Abstract

The choice between the onshore and offshore markets by a corporate bond issuer says something not only about the yields demanded by investors in the two markets but also about the depth and liquidity of the two markets relative to each other. This is especially true for firms in emerging markets. This paper investigates systematically how this choice has changed over time for eight emerging markets in Asia – China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore and Thailand. For variables measuring depth, liquidity, availability of hedging instruments, and the investor base, we rely on BIS statistics that have not been used in this literature before. We combine these market-level data with firm level data in an unbalanced panel for the eight countries covering the period 1995 to 2007. Our results show that the choice between domestic and foreign markets has changed significantly over time, consistent with the apparent evolution of the depth of the onshore market. We control for variables representing agency, static trade-off and risk management theories of the capital structure. We draw lessons for which types of firms tend to benefit most from the development of the onshore market.

Key words: bond financing, foreign currency, derivatives, capital structure, emerging markets, market depth, Asian bond markets

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1 Introduction

Why do firms in emerging markets so often issue bonds abroad? Partly this is to reach deeper global markets, especially when the domestic market does not have the depth and liquidity for large corporate issues. Problems of original sin (see Eichengreen et al. (2003)) may also lend an advantage to issuing in a foreign currency, which would mean issuing abroad. However, the growth of local bond markets may have increased the viability of large-scale domestic issuance for many emerging market firms. Clearly, the state of market development – which has been changing more significantly for onshore markets – is a driver of where firms decide to issue.

The literature is clear that firm characteristics have a part to play in that decision, in predisposing some firms to seek finance in foreign currency due to their size, and helping to overcome some of the agency costs by providing collateral, for example. Indeed, Rajan and Zingales (1995) and Booth et al. (2001) show this for firms across samples of the G-7 developed countries, and 10 developing countries, respectively. These papers both rely on four key independent variables at the level of the firm: tangible assets, market-to-book ratios, sales as a proxy for size and profitability. The effects of these variables on financing decisions turn out to be broadly similar regardless of the country, whether developed or developing.

The character of the domestic economy is another factor that drives the decision to issue abroad. For instance, Eichengreen and Luengnaruemitchai (2004) argue that country size, strength of institutions, stability of exchange rates, and competition in the banking sectors are factors that contribute to the development of bond markets. Burger and Warnock (2006) add that countries with stable inflation rates and strong creditor rights tend to achieve more developed local bond markets and to rely less on foreign-currency-denominated bonds. However, in much of this literature, domestic characteristics tend not to change very much from year to year.

The view taken in this paper is that corporate financing decisions are conditional on market depth characteristics as well as on the usual firm characteristics. The US dollar bond

market has been well developed for some time. A number of papers, most notably Hale and Spiegel (2012) and Habib and Joy (2010), have already documented how the introduction of the unified currency of the euro led to dramatic shifts in corporate financing activity for firms outside the euro. Even in the United States, Borio (1990) and Remolona (1990) attribute the rise in corporate leverage during the 1980s in large part to the emergence of the junk bond market. The onshore corporate bond markets in Asian emerging economies have themselves recently been changing rapidly. In looking at the choices of markets in which to raise funds, we emphasize the influence of changes in market depth, broadly defined, while controlling for firm-level factors related to capital structure.

The behavior of firms in emerging Asia since the 1997 crisis offers us a natural experiment. In varying degrees, many of these firms have had access to two corporate bond markets, a relatively small onshore local currency bond market and an already large offshore foreign currency bond market. The offshore market has been deep and liquid from the outset, while the onshore markets in the region has tended to grow in size and has presumably provided more liquidity over time. In this paper, we analyze how the financing decisions of more than 4,600 firms in eight emerging Asian economies - particularly in their choices over the markets in which to seek finance - were affected over time by the development and changing conditions of the onshore markets.

We focus in this paper on the choice by Asian firms to issue in onshore or offshore markets. Issuers facing this decision must consider both the currency of denomination as well as the investor base; see the above-mentioned papers by Hale and Spiegel (2012) and Habib and Joy (2010), as well as Siegfried et al. (2003). Another important paper that focuses on currency choice with a focus on firms in East Asia is Allayannis et al. (2003). Among factors related to market depth, Allayannis et al. (2003) find that the availability of currency derivatives makes local currency and foreign currency debt closer substitutes.

Our dataset includes dynamic indicators of market depth based on the Bank for 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. These additional data are particularly important over the time period of the sample because markets in emerging Asia have developed greatly in response to policy initiatives taken since the Asian crisis. We are also able to control to a greater degree than other papers for important firm characteristics because we use a sample of listed firms, for which a lot of balance sheet information is disclosed.

In our sample, we find many firms that issue only in offshore markets and many firms that issue first in offshore markets before eventually issuing in the onshore market (see Tables 1 and 2). In general, however, we find that over time the preference for the onshore market increases markedly, especially for firms in China, Korea, the Philippines, Singapore and Thailand. It is the younger, unseasoned firms that tend to go offshore. But the bigger the onshore market, the less likely are they to go offshore. Other measures of market depth also matter in the way we would expect.

Our paper also provides guidance on an important policy goal of governments in emerging Asia, the development of local currency bond markets. Over the past decade, authorities of emerging Asian economies have launched a variety of projects to promote local currency bond markets, including the Asian Bond Fund (ABF2) of 12 major central banks in the Asia-Pacific region, administered by the BIS. These initiatives have been catalysts to reform of market practice and regulation, including the creation of mechanisms to mitigate the costs of information asymmetries, provide liquid secondary markets for bonds, and establish active FX hedging markets. To be sure, the initiatives have tended to enhance the government bond markets the most; corporate bond market remain at activity levels well below their US or European counterparts.

The rest of the paper is organized as follows. Section 2 discusses the literature on the choice of markets in which to issue bonds and the capital structure theories. Section 3 we describe our data. Section 4 reports the results on the decision to issue bonds, the choice to issue foreign currency bonds, and the implications for capital structure. Section 6 concludes

the paper and offers an extended policy discussion.

2 Background Literature

What determines bond issuance in a foreign market or currency should be related to the determinants of capital structure, and these determinants in turn are related to drivers of corporate bond issuance more generally. In the following we will briefly review the literature on capital structure theories before discussing the relationship to the decision to issue bonds in domestic or foreign currency.

2.1 Capital structure theories

Our paper relates closely to the literature on capital structure (c.f. Rajan and Zingales (1995), Booth et al. (2001) and Allayannis et al. (2003)), which we have already noted apply to both advanced and emerging economies. Although we cannot do justice to the theories here, we summarize briefly the main hypotheses that are important for our paper.

Static Trade Off Theory. In this theory firms increase total debt, as well as local and foreign debt in response to cost advantages. These might be due to tax treatment (Newberry (1998); Newberry and Dhaliwal (2001)); the level of interest rates, which can result in "clientele effects" (Kim and Stulz (1988)); due to interest differentials between domestic and foreign markets as discussed above (see Graham and Harvey (2001), McBrady and Schill (2007); Habib and Joy (2010); Munro and Wooldridge (2010)); and may also extend to the use of swaps, options and derivatives markets to hedge foreign earnings for example (see. Kedia and Mozumdar (2003)). Larger, more profitable and less risky firms my obtain better terms than others.

Agency Cost Theory. The need for monitoring raises the cost of borrowing externally, but this may be mitigated by collateral assets (e.g. Demirguc-Kunt and Maksimovic (1999) and Booth et al. (2001)), and signaling through greater information provision (often

associated with firms of greater size) and access to high quality lenders and markets (see Ross (1977); Titman and Trueman (1986)). Relationships with a preferred lender can also influence the choice of capital structure as explained by Hoshi et al. (1990).

Pecking Order Theory. Myers and Majluf (1984) 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 to external markets. Allayannis et al. (2003) also argues that foreign currency debt will complement to domestic currency debt since firms use the former only after exhausting the latter; and that firms with foreign listings (even lower down the order) are likely to have obtained as much debt as they desire.

Market Depth Hypothesis. This argument is particularly relevant to emerging financial markets, where depth and liquidity of bond markets may not be as great as in foreign markets. Allayannis et al. (2003) and BIS (2011) suggest that Asian firms tend to experience lack of depth for large 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.

Risk Management Theory. 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 Froot et al. (1993) and Black and Munro (2010)).

2.1.1 The decision to issue in different currencies

The application of 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, the

costs of issuance due to static trade offs, and costs or convenience due to the development of respective markets. 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 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 Graham and Harvey (2001), McBrady and Schill (2007) and Munro and Wooldridge (2010). 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.[1] While McBrady and Schill (2007) restrict their analysis to sovereign and agency issuers that have no foreign currency cash flows to hedge, Graham and Harvey (2001) found the level of foreign interest rates to be an important factor in their survey of firms issuing foreign bonds. Cohen (2005) also finds interest rate differentials to matter for the decision to issue, suggesting a persistent role for uncovered returns. Habib and Joy (2010) consider the opportunities that arise from covered and uncovered interest parity deviations, across a range of major currencies in the period from 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

[1]The analysis of such profitable financing opportunities for firms in global markets goes back to Kim and Stulz (1988), who posit “clientele effects" that only a limited supply of firms can take advantage of in any period.

and Singapore finds that firms take advantage of deviations from covered interest parity in long-term swap markets (Black and Munro (2010)). These theories are closely related to static trade off theories.

The measures of market development have tended to focus on the most readily measured indicators such as market size and turnover. Chinn and Ito (2006), and many other studies, use market size and turnover as measures of market development, as do Eichengreen et al. (2006)), reasoning that larger markets with greater liquidity are more likely to encourage firms to issue bonds by reducing uncertainty for investors. Time-varying policies, such as the Asian Bond Market Initiative or the ABF2, designed to increase liquidity and turnover in bond markets have also been taken into account in some studies (Mizen and Tsoukas (2010); BIS (2011)). Market scale and liquidity are central to the market depth hypothesis since greater market scale provides sufficient resources for issuers and greater liquidity creates an active market for investors and the deepening of the domestic market. This offers a more liquid market, with lower bid-ask spreads, higher turnover, and lower entry costs. Development of the government bond market may also provide a 'benchmark effect' that facilitates the pricing of bonds for corporate borrowers.[2] Siegfried et al. (2003) 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. 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 that 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

[2]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 BIS (2011).

greatly emphasized by market participants in Asia, (see BIS (2011)). 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. BIS (2011) documents 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.

The third measure we use to indicate market development is the scale of the derivatives market. The development of FX markets and derivatives as a proxy measure for ability to swap easily in and out of the domestic and other currencies has also been used as a market specific factor that might determine the extent of bond issuance.[3] 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. This relates to the literature on 'original sin', Eichengreen and Hausmann (1999). 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 Munro and Wooldridge (2010) and Habib and Joy (2010). Interestingly, Mehl and Reynaud (2005) find that in emerging economies the seriousness of the original sin problem is related to macroeconomic conditions and also the size of the investor base.

Whether these markets support foreign currency relative to domestic currency issuance

[3]The degree to which risks in operating through swap and FX markets, such currency risk, interest rate risk, replacement risk, rollover risk can affect the issuance decision has also been examined by Munro and Wooldridge (2010).

is ultimately an empirical question. Gczy et al. (1997) 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. Allayannis and Ofek (2001) find that large multinationals are indifferent between use of foreign currency bonds and use of instruments to create synthetic foreign currency positions. Elliot et al. (2003) find that US firms use actual debt and derivatives to hedge themselves against currency risk, while Clark and Judge (2008) find forward 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. Eichengreen and Luengnaruemitchai (2004), Burger and Warnock (2006), Eichengreen et al. (2006); Siegfried et al. (2003)) examine the impact of accounting standards, legal standards, political-macro risk, tax regime, 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 correclated with other market characteristics discussed above.

Characteristics of the specific bonds themselves are also used in a number of studies (eg Munro and Wooldridge (2010)), such the issue size, the credit quality, sector, maturity, coupons, whether there are single or multiple issues. For example, Black and Munro (2010) find that firms in Australia, Hong Kong, Korea, Japan and Singapore tend to issue abroad when the bonds are lower-rated by the ratings agencies.

In the sections that follow, we examine the significance of these variables to establish support for the various theories of capital structure outlined in this section and to understand the firm-level decision to issue in different currencies. The next section explains the methodology we will follow.

3 Empirical Methodology

This section provides an overview of the modeling techniques, the estimation strategy and the questions we intend to tackle in the results section. We split the section into three parts corresponding to the three parts in the results section that follows, to address three central questions: First, what factors at the level of the firm and in the market environment prompt a firm to issue a bond in domestic or foreign currency? Second, how do these factors influence the decision to issue in foreign currency markets compared with the decision to issue in domestic and foreign bonds more generally? Third, what does the significance of market variables imply for the support of different capital structure theories?

The first question determines whether a firm issues a bond inthe first place, irrespective of the choice of currency. The natural empirical method to evaluate this decision is the probit model, which determines the probability that a firm will issue a bond in domestic and foreign currency markets in a given year based on our chosen explanatory variables $Pr(BOND_{ijt} = 1) = \alpha_{1i} + \mathbf{X}_{ijt}\beta_{1i} + \mathbf{Z}_{jt}\gamma_1 + \epsilon_{1ijt}$. We define the dependent variable, $BOND_{ijt}$, as a dummy variable that equals 1 if firm i issued a bond in domestic or foreign currency markets, in country j, in year t, and 0 otherwise. Our specification includes firm-specific regressors, $\mathbf{X}_{ijt}$, following Mizen and Tsoukas (2010), 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 a predisposition of the firm to issue in bond markets, and its ability to overcome agency problems through the strength of its balance sheet. These are evaluated at time t-1 to mitigate potential endogeneity concerns; in addition, the model includes a time trend to account for the fact that debt markets have become increasingly international over time (see Black and Munro (2010)). We also allow for ratings and previous issuance activity.

The major interest in this paper is the impact of market development indicators, $\mathbf{Z}_{jt}$, 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, γ, which reveal the sensitivity of the issuance decision to market development. Our expected signs are given in Table 1.

At the next stage we examine what influences the firm's decision to issue in foreign debt. The previous model considered issuance in domestic or foreign currency markets, but here we focus on foreign issues. We generate the variable $FOREIGN_{ijt}$, which takes the value one if the bond is denominated in foreign currency, and zero otherwise. Our model is then modified to $Pr(FOREIGN_{ijt} = 1) = \alpha_{2i} + \mathbf{X}_{ijt}\beta_{2i} + \mathbf{Z}_{jt}\gamma_2 + \epsilon_{2ijt}$

The expectation for the sign and significance of the variables is the same as the previous section as listed in Table 1. While market development variables are still our main concern, we would now consider the relative advantage of issuing in foreign currency based on the uncovered interest differential (SID_{jt}) to be more important compared to the previous model that included both domestic and foreign currency issues. Similarly, higher withholding taxes ($WITHTAX_{jt}$) would be more likely to deter foreign holders of bonds issued in foreign currency, and we would expect to see a stronger effects in this model compared to the previous case, which included domestic and foreign bonds. the scale of the onshore market ($ONSRATIO_{jt}$) is also likely to be important, because it measures the incentives to issue in domestic currency.

We have strong priors that financial firms and non-financial firms will behave differently in their issuance decisions, based on the differences between the nature of the firms, and results reported by Hale and Spiegel (2012). We will split out sample into financial and non-financial firms to explore these differences. Similarly, we separate seasoned issuers from new issuers to explore these differences.

The final question we address is the capital structure question, with reference to the ratio of foreign currency bonds outstanding to total liabilities, which has some similarity with the measures used by Allayannis et al. (2003) and Faulkender and Petersen (2006).

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, but in this section we consider the scale of foreign currency issues relative to total liabilities. As in Allayannis et al. (2003), we formulate a model of debt structure as $FCY/TL_{ijt} = \alpha_{3i} + \mathbf{X}_{ijt}\beta_{3i} + \mathbf{Z}_{jt}\gamma_3 + \epsilon_{3ijt}$ where the dependent variable, FCY/TL_{ijt}, is the ratio of foreign currency bonds to total liabilities of the firm i in country j at time t. The choice of the explanatory variables is guided by the previous work on capital structure and access to financial markets. We use the same variables used in the previous equations, but in addition we 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. Our initial estimates are made using OLS, but since we note that the dependent variable is zero for a substantial part of the population introducing a truncated distribution, we compare our initial results with a Tobit estimate that allows for these effects.

4 Data

4.1 Data definitions

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 separates our study 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, 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 the maturity in the bonds measured.[4]

[4]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.

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 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. 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 ($SIZE_{ijt}$) we calculate the logarithm of the firm's total assets consistent with Calomiris et al. (1995). We also measure growth in sales ($GROWTH_{ijt}$) to capture the expansion of the firm, and the greater need for finance. To control for the age of the firm (AGE_{ijt}) we measure the number of years a firm has been listed on the stock exchange. We consider five dimensions of financial health from the balance sheet: leverage ($LEVER_{ijt}$), profitability($PROF_{ijt}$), liquidity($LIQUID_{ijt}$), collateral assets in total assets ($COLL_{ijt}$) and long term debt in total debt ($LDEBT_{ijt}$). Leverage is measured as total debt over total assets indicating the firm's overall indebtedness used previously by Cantor (1990), Pagano et al. (1998), Datta et al. (2000), Dennis and Mihov (2003) and Bougheas et al. (2006). Profitability 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 Dennis and Mihov (2003). The liquidity ratio is measured by current assets over total liabilities, and has been used in earlier studies such as Mateut et al. (2006), Hale and Santos (2008), Guariglia and Poncet (2008) and Guariglia et al. (2011) 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 Demirguc-Kunt

and Maksimovic (1999) and Booth et al. (2001) to explain debt composition. Long term debt in total debt is the ratio of debt over five years to maturity. Finally, we indicate the existence of a bond rating as a signal of quality ($RATDUM_{ijt}$). This has been employed by Whited (1992) and Kashyap et al. (1994) among others. We create a dummy variable which takes the value one if a firm registers a Standard & Poor's (S&P) firm rating in a given year, and zero otherwise.

Consistent with the findings of Mizen and Tsoukas (2010) we consider whether a firm was a previous issuer in the domestic ($PREVDOM_{jt}$) and foreign ($PREVFOR_{ijt}$) markets separately, by assigning a value of one for a firm that had issued at any time in the past, and zero otherwise. A bond rating dummy ($RATDUM_{ijt}$) is defined to indicate the reputational characteristics of the firm from previous issues.

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$bn at the end of each year in both domestic (DDS) and international (IDS) markets following Black and Munro (2010). Chinn and Ito (2006), Eichengreen et al. (2006) and Mizen and Tsoukas (2010) also account for size of the bond market. We form a ratio of the total debt securities to GDP to indicate scale or market depth ($DEBTSEC_{jt}$).

We measure the scale of the onshore in the following way. We employ the ratio of debt securities issued onshore over the debt securities issued both onshore and offshore ($ONSRATIO_{jt}$), 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 the BIS Guide to the International Financial Statistics, (2009).

To measure the incentives to issue, we use short-term interest differentials (SID_{jt}) as measures of the uncovered differential creating opportunistic reasons to issue in foreign currency following Graham and Harvey (2001), McBrady and Schill (2007), Habib and Joy

(2010) and Munro and Wooldridge (2010). 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.[5]

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$mn, which we then use to form a ratio of investor demand to GDP ($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 EMEAP (2011).

To measure the scale of the foreign exchange swaps, derivative 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 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 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

[5]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.

manufacturing, utilities, resources, services and financials.

4.2 Descriptive analysis

Tables 3 and 4 report summary statistics. In Table 3 we show the means and standard deviations for the firm-specific explanatory variables; these are reported for all firms, and then for domestic and foreign bond issuers separately, and for seasoned issuers and starters separately. We report p-values from a test of equality of the means for the different types of issuers, which has a null of equality. In Table 4 we present same information as well as market indicators broken out into individual countries.

Table 3 reveals that domestic issuers are smaller, less levered, more profitable, grow more slowly than foreign issuers. Domestic bond markets require less of domestic issuers in terms of firm size and growth characteristics, and favors firms that have lower debt and greater profitability, but domestic issuers also have better ratings than foreign issuers (a lower numerical values equal better ratings), and the fact that larger firms issue in foreign currency could be indicative of lack of market depth. Anecdotal evidence suggests that firms with poorer ratings issue abroad because they can find investors willing to hold assets lower on the rating scale because these markets for these assets exist and are deeper and more liquid internationally, in contrast to local markets; see Remolona and Shim (2008). We will explore in this paper whether greater size and liquidity of markets makes domestic bond issuance more attractive.

Firms that are seasoned tend to be larger, more levered, less liquid and faster growing. In short they are similar to the issuers of foreign bonds, and they too have poorer ratings than new issuers on average.

Table 4 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 to total liabilities (FCY/TL), because the large firms in these countries have large debt levels and small amounts of foreign currency bonds outstanding. As Allayannis et al. (2003) explains, lack of market depth is one explanation for the high level of domestic and foreign currency debt use that is 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; Indonesian, Korean and Chinese firms grew fastest in this sample period, while firms in Hong Kong, Malaysia, the Philippines and Thailand grew more slowly. Indonesian and Thai firms were the most levered, but firms in Hong Kong 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 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 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.

5 Results

Our starting point is to report the determinants of the decision to issue a bond in local or foreign currency, following the studies of financial structure in Asia such as Burger and Warnock (2006) and Eichengreen et al. (2006). If we can first deduce the factors that cause firms in Asia to issue bonds we can then consider the choice of currency and then the structure of the debt following Rajan and Zingales (1995), Demirguc-Kunt and Maksimovic (1999), Booth et al. (2001), and Allayannis et al. (2003).

5.1 The decision to issue in domestic or foreign currency markets

Our findings from our first model are reported in Table 5 and are very similar to the results reported in Mizen and Tsoukas (2010), so we will discuss the results only briefly before moving on to consider the influence of other variables.

5.1.1 Firm-specific characteristics

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 issue. We expect to find that the coefficient on SIZE is positive and significant, as it is in other studies e.g. Calomiris et al. (1995), and that is what we find. Pagano et al. (1998) and Datta et al. (2000) argue that growing firms are more likely to issue bonds than firms that have fewer opportunities for expansion. Growth in sales (GROWTH) records the expansion rate, and therefore the possibility that a firm may have exhausted other sources of funds to finance further expansion. We indicate how long a firm has been drawing on equity finance using a the age variable (YEARS). This variable has a positive sign, registering the fact that

the firm can access markets more easily with greater age.

The financial condition of the firm is also an important determinant of access to external finance as argued by Leland and Pyle (1977), Myers and Majluf (1984), Rajan (1992) and Pagano et al. (1998). We consider leverage, the long term debt ratio, profitability, liquidity and collateral assets in total assets as indicators from the balance sheet. We have noted in our discussion of the literature that high leverage can be associated with an unhealthy balance sheet and greater difficulties obtaining funds on the markets(see Cantor (1990) and Bougheas et al. (2006)), but equally, leverage can be a good signal, if it indicates good credit standing in the past (see Pagano et al. (1998), Datta et al. (2000) and Dennis and Mihov (2003)). It is therefore ambiguous whether we expect a positive or negative sign on this variable, but we find that the coefficient in our results is positive and significant confirming the second view. When we include long-term debt in total debt (LDEBT) as a measure of the maturity structure of the firm's existing debt, we find the coefficients is positive confirming the market depth hypothesis (c.f. Barclay and Clifford (1995) and Allayannis et al. (2003)), and suggesting that a firms with a high ratio of long term debt in total debt may have greater incentives to issue bonds.

Dennis and Mihov (2003) suggests that bond issuance should be more feasible for firms with higher profits, therefore, we would expect a positive relationship between profitability (PROF) and the probability to issue corporate bonds. Allayannis et al. (2003) uses profitability to measure the benefits of tax advantages from debt issuance that create incentives for the firm to issue under the static trade off theory. This also implies a positive sign on profitability, and our results confirm this in the data.

Allayannis et al. (2003) argues that asset tangibility can reassure investors, according to the agency theory of debt, therefore we expect collateral assets to positively influence bond issuance even though bonds are unsecured. Investors (particularly foreign investors) have less ability to monitor the firm, and tangible assets provide evidence that there are assets to seize in the case of default. Our results for collateral assets (COLL) indicate a positive

influence on probability of issue in Table 4 of the results. Information asymmetries that lie behind the agency theory are likely to be greater for Asian firms than for firms in the foreign investors' home country, hence, the significance and strength of this effect in our results indicates the importance of overcoming these asymmetries.

As an additional balance sheet indicator, we employ the liquidity ratio (LIQUID), which has been used in earlier studies (Mateut et al. (2006)), as an indicator of the liquid assets of the firm. Liquidity can be positively or negatively signed, because it could be taken as a shortage of funds due to low shareholder equity, or an indicator of poor creditworthiness. We find it has a small but insignificant negative effect on issuance.

To explore the importance of information asymmetries we exploit a variable indicating previous issuance used by Mizen and Tsoukas (2010). In this case as we consider whether a firm was a previous issuer in the domestic (PREVDOM) and foreign (PREVFOR) markets separately. The coefficients on these variables are positive and strongly significant in Table 4, indicating that once the firm has issued it is much more likely to issue in future periods. This supports the agency theory that firms can overcome information asymmetries by having signaled their creditworthiness in the past (Titman and Trueman (1986)) and has some similarities with the cross-listing variable used in Allayannis et al. (2003).

A similar test of agency theory can be obtained by introducing the indicator of a rating (RATDUM), which may be an important signal that the firm has access to public debt markets or intends to access the bond markets, although some unrated bonds are issued. The rating relates to the bond but signals the quality of the firm intending to issue. This variable has been employed in the literature (see Whited (1992) and Kashyap et al. (1994), among others) and we argue that if a firm has a bond rating then this will increase the probability of issuance. The coefficient on this variable is positive and significant in our results reported in Table 4 column 3. When we explored the distinction between investment grade and non investment grade, or AA rated and above versus below AA rated, we found similar effects. Essentially the majority of listed firms have ratings of AA or above.

5.1.2 Market indicators

Market variables capture the impact of market characteristics on the probability of bond issuance. These reveal information about the different capital structure theories. We find that the market scale measure, DEBTSEC, has a positive coefficient and is highly significant in the probit equation defining probability of issue in Table 5 column 4, supporting the market depth hypothesis. Similarly, ONSRATIO gives the relative size of the onshore to the offshore market. It has a positive effect that is significant at the 10% level, which provides further support for the market depth hypothesis.

We include a measure of the turnover in the stock market (STOCKTVR), since all the firms in our sample are listed. This is a test of the pecking order theory and the static trade off theory because firms may have a preference to access the stock market rather than to issue debt especially if stock market turnover increases. We expect and find a negative sign in column 4 that suggests a stock market with higher turnover provides a more attractive substitute for issuance in the bond market.

We find that SID has the expected negative sign (given that both differentials are defined as the local minus foreign interest rate) in column 5 of Table 4. This confirms the result reported in Miller and Puthenpurackal (2002) that firms issue in Yankee bonds when the interest cost is favorable. The choice of a short term interest differential at the 3-12 month maturity is not important, since we find that a longer-maturity differential also has a negative sign. We do not include both variables because they are highly collinear.

Another indicator of the incentive to issue is the existence of a sizable investor base. The estimated coefficient on the CPIS-IIP variable measuring foreign investor demand is positive and significant, but its impact on the probability of issuance is quite small. A larger foreign investor base creates incentives to issue consistent with the static trade off theory. By including a dummy variable for the existence of withholding taxes (WITHTAX) we test whether the dis-incentives from withholding tax affect investors and therefore also issuers of bonds. The variable has a negative and significant coefficient as expected, with a much

larger impact than the CPIS-IIP variable. We interpret this as a negative influence on the probability of issuance since it indirectly diminishes the incentives for foreign investors to hold of local currency bonds, and provides evidence in favor of the static trade off theory.

A final variable in our results reported in Table 5 is the size of the foreign exchange swaps, derivative and options market (DERIV) in each country is consistent with the static trade off and the risk management theories we expect a larger volume of swaps, derivatives and options turnover to provide greater opportunity for firms to hedge their exchange rate exposure, and therefore to increase the probability of issuance in foreign currency, and this is what we find.

5.1.3 Seasoned versus unseasoned issuers

In Tables 6 and 7 we report the breakdown of our data into seasoned and unseasoned issuers, for non-financial and financial firms respectively. There were too few observations to report unseasoned financial firms.

We find our empirical results to be quite striking. The results suggest that many firms in Asian emerging markets cut their teeth by first issuing in the offshore market rather than the onshore market, for example Korean firms such as Jinro, Hanbo Steel, LS Cable, LG Telecom, and the banks Bangkok Dusit, Public Bank Berh and Metro Bank in Thailand, Malaysia and Philippines. Once they become more seasoned, it often makes sense for firms to shift to the onshore market. Hence our results reported in Table 6 show that the availability of collateral matters for seasoned issuers but not for unseasoned issuers. Collateral is presumably more important in the onshore market than in the offshore market. Similarly, credit ratings matter for unseasoned firms but not for seasoned firms, because the offshore market takes greater note of ratings than the onshore market. Moreover, in this issuance decision, the size of the onshore matters for seasoned non financial firms, but not for unseasoned firms, and the overall size of the market is especially important for seasoned financial firms, but not at all for unseasoned non-financial firms. Factors such as the size of the foreign investor base and

the interest differential have positive effects on the bond issuance decision.

All this suggests that the fixed costs of entry into a bond market tend be higher in the onshore market than in the offshore market. But once an issuer gains enough exposure and experience, the marginal costs tend to be lower in the onshore market. As the onshore market develops, those fixed costs would come down and the shift from offshore to onshore issuance would happen sooner for a given issuing firm.

5.2 The choice to issue in the foreign bond market

At the next stage we examine what influences the firm's choice between foreign and domestic debt. We use the variable FOREIGN, which takes the value one if the bond is denominated in foreign currency, and zero otherwise as our dependent variable.

The results for foreign currency denominated bond issuance is driven by a much smaller set of variables. First, firms that are larger are more likely to issue in the foreign currency. This variable proves to be consistently important in all our specifications in Table 8 columns 1-7. It is perhaps not surprising that firms that are larger tend to issue in foreign currency, since the scale of the firm will allow it to absorb the higher costs of a foreign issue, and will give the firm greater name recognition making the bonds more marketable. Allayannis et al. (2003) notes that size can be an indicator that beyond some scale firms may exhaust the finance available in local markets, therefore a positive impact of size on foreign currency issuance provides support for the market depth hypothesis. To the extent that the firm size reduces the costs of access to foreign markets, there may also be support for the static trade off theory.

Firms that are more leveraged and have a greater proportion of long term debt in total debt are also are more likely to issue in foreign currency, which confirms the market depth hypothesis, since firms that have a preference for longer term debt (Barclay and Clifford (1995)) will tend to seek foreign currency bond issues, where the maturity may not differ, but the market for issuance may be deeper (Allayannis et al. (2003)).

We find strong evidence in support of the agency theory of debt structure since the firm specific variable measuring tangibility of asset (COLL) is positive and strongly significant in Table 5. The ability to overcome information asymmetry through a high ratio of tangible assets to total assets is likely to make foreign currency bond issuance easier, since the foreign investors have greater difficulty than domestic investors in monitoring the firm. The fact that a firm has a rating (RATDUM) is also important, having a positive and significant effect in columns 2-7. This sends a positive signal to the same investor group, reflecting the underlying quality of the firm including its standards of governance and accountability (Diamond (1989)).

In order to determine whether firms choose to issue abroad because they face limitations in the domestic bond market we consider the market size and liquidity indicators from the BIS statistics. If measures of greater scale and liquidity reduce the issuance in foreign markets then we can identify that firms that are well qualified to issue foreign bonds choose instead to issue in domestic markets when scale and liquidity are sufficient. We would argue that the market depth hypothesis receives greater support as a result.

The market indicators reveal that the relative size of the onshore market (ONSRATIO) is an important determinant of the decision to issue in foreign currency. A larger onshore market reduces the probability of the foreign issue, which is perhaps the clearest indication of the preference for domestic issuance if there is sufficient scale. This supports the market depth hypothesis, since the larger the onshore market the greater the incentive to issue in domestic currency onshore. It can also be interpreted as a test of the pecking order hypothesis and static trade off theory, since firms will access the bond market if there is sufficient scale in preference to the foreign market, because the costs of issue are likely to be lower, and the investors more familiar with the issuers than in foreign markets, all other things equal. Firms issue in foreign currency bonds when the capacity of the local market has been exhausted, making foreign bonds complements to local bonds, but the firms revert to the domestic market if its capacity increases.

The variables that capture the incentives from interest rates and tax treatment support the static trade off and risk management theories. The absolute size of the coefficients on these variables in columns 4-6 of Tables 5 and 8 can be compared, revealing that the impact of the interest differential on foreign issuance is almost double the impact on issuance in domestic and foreign markets combined. We would expect this, since our results in Table 5 report the incentives to issue in foreign currency markets, which would be more strongly influenced by opportunistic motives if the interest differential was favorable. The withholding dummy is significant at the 1% level and negative in Table 8, for the decision to issue in foreign currency, while it is insignificant in Table 4 for the decision to issue in domestic and foreign currency. Again, this shows tax treatment to be more important to issuers in foreign markets compared to all issuers in domestic and foreign markets. Therefore, firms issue less in foreign currency if the interest rate costs are higher in foreign currency, and they issue less if the withholding tax treatment creates additional disincentives for foreign investors to participate in bond purchases.

The size of the swaps and derivatives market has a positive and significant effect in column 8 of Table 8 on the decision of firm to issue, as firms can hedge their positions, supporting the risk management theory. This effect also has a high level of significance compared to the previous table, suggesting that the scale of the derivatives market is very important for the decision to issue in foreign currency since it facilitates transformation of payments into and out of different currencies.

When we consider the choice of currency by seasoned versus unseasoned issuers in Table 9 we find that once a firm has decided to issue, the size of the market and the onshore market in particular matters for unseasoned issuers, since the negative coefficients indicate that the larger the market the less likely they are to issue in foreign currency, but market size does not matter for seasoned non-financial issuers. Other variables such as the size of the foreign investor base and withholding tax treatment measure the attraction to foreign investors of participation in local market also seem to dissuade firms from issuing in foreign currency.

The factors such as the interest differential and the existence of derivatives markets that provide an ability to swap easily in and out of the domestic and other currencies affect the cost of participation in different markets. This might account for the examples we found of companies that initially issue in domestic currency but subsequently issue in foreign currency e.g. the banks China Merchant Bank, China Construction Bank, Hang Seng Bank and Bank Thai.

The conclusions we draw are that the choice of currency is determined by firm characteristics consistent with the need for market depth including firm size, leverage and long term debt ratio. The important market indicators are market scale, the incentives to issue and the ability to hedge risk, which support market depth, static trade off and market risk theories.

5.3 Debt structure

The next question we address is the capital structure question, with reference to the ratio of foreign currency bonds outstanding to total liabilities, which has some similarity with the measures used by Allayannis et al. (2003) and Faulkender and Petersen (2006). Our initial observations in the descriptive statistics show 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 now examine the capital structure theories in detail in Table 10.

Our first two columns in Table 10 report estimated results using OLS. We find that none of the firm level variables are statistically significant.[6] The results in columns 1 and 2 show the importance of variables associated with the market risk management theory and the static trade off theory. An increase in turnover in the stock market ($STOCKTVR$), where all our firms are listed reduces the ratio of foreign currency bonds to total liabilities, which is consistent with the static trade off theory. We also find that the short interest differential (SID) has the expected negative sign, as does the withholding tax dummy ($WITHTAX$)

[6]Preliminary regressions found weak evidence of significance for $SIZE$ and $MTBOOK$ variables, but these became insignificant as additional variables were added to the equations.

although in this case the coefficient is not significant. Both variables support the risk management and static trade off theories. The scale of foreign investor participation ($CPIS - IIS$) has a positive influence on the ratio, consistent with the market depth hypothesis.

Columns 3 and 4 report estimates using the Tobit estimator, which reveals 686 of the 820 firms have left censored observations. The results in these columns show that $SIZE$ has a small positive influence on the ratio of foreign currency bonds to total liabilities, which is consistent with the agency theory. Profitability ($PROF$) has a negative and significant coefficient, which is the opposite to the prediction of the pecking order theory, which argues *domestic* bonds should fall relative to total liabilities as firms become more profitable. A variable that indicates previous foreign currency bond issuance has a positive and significant coefficient, which shows that signaling is important as the agency theory predicts. An increase in turnover in the stock market ($STOCKTVR$) reduces the ratio of foreign currency bonds to total liabilities as we found in the OLS results, and the impact of the short interest differential (SID), and scale of foreign investor participation ($CPIS - IIS$) also have the same effect as before. In columns 3 and 4 we find that the withholding tax dummy ($WITHTAX$) becomes significant and strongly negative. These results confirm the support for the risk management, market depth and static trade off theories.

We find that these results help confirm a number of theories of capital structure, and complement the findings for the probability of issuance in the previous sections of the paper.

6 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 of emerging Asian economies have launched a variety of projects to promote local currency bond markets. The most significant of these projects have been the ABF2 of 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 to 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 5 years. Liberalisation of foreign exchange administration rules have facilitated hedging arrangements entered into by resident and non-resident investors. Meanwhile, the lowering of barriers to the development of FX swap 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.

What difference have such reforms made to actual financing decisions of firms in the region? For many such borrowers, deep and liquid off-shore markets have long provided financing for debt denominated in US dollars or euros. How do firms decide between off-shore and on-shore markets? Has the emergence of access to two parallel corporate bond markets changed the capital structure decision? More generally, do the observed choices between local and foreign currency shed light on the various theories of capital structure, including costly monitoring and agency theories, pecking order, market depth and risk management theories?

Our results provide the strongest support for the market depth hypothesis, i.e. the hypothesis that the choice of market will be determined to a large extent by the ability of the scale and depth of the market in question to accommodate borrower demands, plays a critical role in both the decision to issue and which market to issue in. Measures of domestic market scale and (relative) liquidity have a positive and highly significant impact on overall issuance, while measures which proxy for the probability of issuers overstretching local currency lending markets such as firm size, leverage and long-term debt ratio increase the likelihood of going offshore. The market depth hypothesis was also supported by the

importance of the existence of a larger foreign investor base as well as the exemption of withholding taxes for non-resident investors. Issuers from countries with a large foreign investment presence are more likely to issue bonds, and more likely to do so on-shore. Once the depth of the market was increased via withholding tax exemptions for non-residents, corporations were more likely to issue on-shore as well.

Confirmation of the risk management theory – i.e. the hypothesis that firms that are more able to control the exchange rate risks, should be more likely to issue offshore in a foreign currency – was evident based on tests utilizing data from a recently updated central bank survey on derivative markets in different currencies. The size of currency hedging markets in each country – including FX swaps, currency swaps and options market and other instruments covered by the BIS Triennial Survey – clearly increases the probability of issuance in foreign currency.

We also find evidence for the static trade-off theory from the importance of interest rate differentials and withholding tax treatment for foreign investors. Agency theory and the importance of costly information were supported by the significance of collateral as well as credit ratings in both the overall debt regressions and the foreign currency regressions. This was noticeable in the results for the capital structure of the firm as well as the probability of issue in different currencies. Mixed results were obtained for the pecking order theory. The view that domestic issuance is preferred to foreign issuance when possible, was unsupported by tests. In particularly we found no evidence that highly profitable firms would be less likely to issue bonds overall, and less likely to issue in domestic currency in particular. In fact we found the opposite.

6.0.1 Policy Implications

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 increase of 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 non-resident investors. Further liberalization of foreign exchange administration rules, including the removal of impediments to the development of FX swap 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 swap 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 ratings 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 for enhancing 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 Markets 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 of this paper also suggest that market liquidity is important, and that policymakers 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.

Finally, policymakers should consider expanding the range of central bank-sponsored bond funds. The ABF2 was designed to exclude corporate bonds and asset-backed securities, since central banks hoped to avoid moral hazard issues and to ensure the eligibility of ABF2 as foreign reserves, which was critical to the participation of many Asian central banks.

However, as a specific effort to foster the development of corporate bond markets, central banks may wish to consider launching a third stage of the ABF2 which would be dedicated to investment in corporate bonds. The aim would be to stimulate corporate bond markets as a source of funding, as well as promote them as an asset class for both resident and non-resident investors.

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Table 1: Corporate bond issuance in sample economies (1991-2008)

	No of Issues	Number Foreign Currency	Foreign currency denominated number as % of total	Amount of Issuance (BB USD)	Amount Foreign Currency (BB USD)	Foreign currency denominated issuance as % of total
China						
1991 – 2003	4	2	50%	3	3	90%
2004 – 2008	89	4	4%	342	10	3%
Hong Kong						
1991 – 2003	9	4	44%	1.9	1.5	79%
2004 – 2008	101	35	35%	21.3	4.7	22%
Indonesia						
1991 – 2003	19	4	21%	5,960	0.6	0%
2004 – 2008	94	15	19%	28,234	0.9	0%
Korea						
1991 – 2003	212	60	39%	8,976	32	0%
2004 – 2008	3279	213	7%	130,401	354	0%
Malaysia						
1991 – 2003	42	2	5%	5	0.2	4%
2004 – 2008	268	5	2%	31	1.8	6%
Philippines						
1991 – 2003	12	10	83%	4	2	48%
2004 – 2008	43	4	9%	114	1	1%
Singapore						
1991 – 2003	39	30	77%	25	19	78%
2004 – 2008	138	40	29%	30	17	55%
Thailand						
1991 – 2003	99	31	31%	143	3	2%
2004 – 2008	184	18	10%	558	40	7%

Table 2: Different corporate bond issuance patterns (1991-2008): Selected sample firms

	Nationality	Industry
Firms that only issue in foreign currency		
Cathay Pacific	Hong Kong	Airline
Daewoo	Korea	Distribution
Samsung Electronic	Korea	Electronic
Chartered Semiconductor	Singapore	Semiconductor
Bangkok Land	Thailand	Real estate
Robinson	Thailand	Distribution
Singapore Telephone	Singapore	Telecommunications
Hong Kong Mass Transit	Hong Kong	Transportation
Firms that only issue in domestic currency		
Asiana Air	Korea	Airline
Hotel Properties	Singapore	Hotel
Petra Perdana	Malaysia	Petroleum
Good Morning Securities	Korea	Securities
Petro Authority	Thailand	Petroleum
Silver Bird Group	Malaysia	Hotel
Bank of Ayudhya	Thailand	Bank
Firms that issue first in foreign then domestic currency		
Jinro	Korea	Beverage
Hanbo Steel	Korea	Steel
LS Cable	Korea	Cable
LG Telecom	Korea	Cellular
Bangkok Dusit	Thailand	Bank
Public Bank Berh	Malaysia	Bank
Metro Bank	Philippines	Bank
Firms that issue first in domestic and then in foreign currency		
Shinsaegae	Korea	Retail
China Merchant Bank	China	Bank
China Construction Bank	China	Bank
Hang Seng Bank	HK	Bank
Bank Thai	Thailand	Bank
Hung Chang	Korea	Telecom
CJ Corporation	Korea	Diversified

Table 3: Summary statistics for the firm-specific variables

	All firms	Domestic	Foreign	Diff.	Seasoned	Starters	Diff.
$SIZE$	17.707	17.629	18.136	0.000	17.708	14.955	0.000
	(3.41)	(3.45)	(3.17)		(3.41)	(3.11)	
$GROWTH$	0.108	0.104	0.124	0.000	0.107	0.068	0.000
	(0.35)	(0.35)	(0.39)		(0.35)	(0.44)	
$YEARS$	13.719	13.867	12.930	0.344	13.716	13.824	0.155
	(4.81)	(4.87)	(4.34)		(4.81)	(4.88)	
$LEVER$	0.342	0.342	0.344	0.000	0.342	0.258	0.000
	(0.24)	(0.23)	(0.25)		(0.24)	(0.25)	
$PROF$	0.032	0.034	0.025	0.000	0.032	0.033	0.596
	(0.12)	(0.11)	(0.12)		(0.11)	(0.15)	
$LIQUID$	0.403	0.405	0.389	0.544	0.402	0.471	0.000
	(0.21)	(0.21)	(0.20)		(0.21)	(0.23)	
$COLL$	0.026	0.025	0.030	0.271	0.025	0.026	0.648
	(0.06)	(0.05)	(0.07)		(0.05)	(0.06)	
$RATDUM$	0.138	0.119	0.245	0.000	0.138	0.028	0.000
	(0.35)	(0.32)	(0.43)		(0.34)	(0.16)	

Notes: The Table reports sample means with standard deviations in parentheses. The p-value of a test of the equality of means is reported. $SIZE$: Logarithm of total assets. $GROWTH$: Growth in sales. $YEARS$: Number of years listed on the stock exchange. $LEVER$: 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. $RATDUM$: Presence of firm rating.

Table 4: Summary statistics by country

	China	Hong Kong	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand
FCY	143.166	33.137	6.737	19.109	49.153	30.388	29.606	23.992
	(267.67)	(117.87)	(38.57)	(58.62)	(137.87)	(83.604)	(121.05)	(66.72)
LCY	67.966	30.107	6.737	14.561	4.498	6.679	15.341	11.746
	(184.82)	(115.49)	(16.07)	(50.15)	(37.13)	(27.35)	(94.318)	(41.87)
$LNTL$	15.03	14.443	20.001	19.678	12.923	15.161	12.245	15.032
	(1.56)	(2.09)	(2.22)	(1.85)	(1.58)	(2.03)	(1.76)	(1.61)
FCY/TL	0.026	0.002	0.006	0.00005	0.02	0.01	0.10	0.004
	(0.09)	(0.01)	(0.06)	(0.00)	(0.14)	(0.09)	(0.36)	(0.01)
$SIZE$	15.056	14.304	19.891	19.471	12.795	15.304	12.066	15.037
	(1.51)	(2.04)	(2.17)	(1.71)	(1.52)	(1.95)	(1.68)	(1.61)
$GROWTH$	0.084	0.052	0.126	0.102	0.052	0.038	0.077	0.048
	(0.60)	(0.49)	(0.43)	(0.35)	(0.41)	(0.47)	(0.39)	(0.35)
$YEARS$	10.317	15.099	11.350	10.991	15.499	13.517	14.769	15.677
	(3.30)	(5.08)	(4.63)	(4.55)	(4.40)	(2.63)	(5.21)	(4.09)
$LEVER$	0.258	0.192	0.374	0.281	0.256	0.222	0.209	0.343
	(0.18)	(0.19)	(0.34)	(0.22)	(0.25)	(0.22)	(0.18)	(0.31)
$PROF$	0.067	0.023	0.016	0.031	0.032	0.012	0.045	0.024
	(0.17)	(0.18)	(0.16)	(0.14)	0.13)	(0.14)	(0.13)	(0.15)
$LIQUID$	0.487	0.442	0.455	0.491	0.469	0.333	0.518	0.412
	(0.22)	(0.25)	(0.24)	(0.19)	(0.21)	(0.21)	(0.24)	(0.23)
$COLL$	0.033	0.028	0.017	0.023	0.033	0.031	0.019	0.017
	(0.05)	(0.07)	(0.05)	(0.05)	(0.07)	(0.08)	(0.05)	(0.05)
$RATDUM$	0.004	0.073	0.091	0.048	0.017	0.082	0.030	0.052
	(0.07)	(0.26)	(0.28)	(0.214)	(0.13)	(0.27)	(0.17)	(0.22)
$ONSRATIO$	0.942	0.554	0.757	0.898	0.823	0.603	0.766	0.771
	(0.05)	(0.05)	(0.24)	(0.04)	(0.03)	(0.07)	(0.11)	(0.13)
SID	-1.387	0.022	11.945	2.750	-0.301	4.636	-2.489	0.789
	(1.61)	(1.11)	(7.79)	(3.00)	(1.40)	(2.79)	(1.35)	(2.98)
$DEBTSEC$	0.0005	0.045	0.004	0.005	0.105	0.074	0.062	0.019
	(0.00)	(0.01)	(0.01)	(0.002)	(0.035)	(0.02)	(0.03)	(0.10)
$CPIS-IIP$	6.044	86.035	26.060	58.124	132.261	166.952	185.661	25.797
	(1.75)	(48.53)	(14.28)	(43.08)	(63.34)	(33.46)	(51.20)	(8.013)
$DERIV$	1.14	4.061	1.710	10.288	18.531	12.138	7.446	2.754
	(1.03)	(0.12)	(1.03)	(0.07)	(1.72)	(1.72)	(2.06)	(2.43)
$STOCKTVR$	1.196	0.567	0.443	2.343	0.389	0.257	0.588	0.742
	(0.53)	(0.20)	(0.11)	(0.81)	(0.16)	(0.11)	(0.21)	(0.27)

Notes: The Table reports sample means with standard deviations in parentheses. FCY: The amount of foreign denominated bonds in millions of US Dollars. LCY: The amount of domestic bonds in millions of US Dollars. $LNTL$: The log of total liabilities. FCY/TL: The ratio of foreign bonds to total debt. $ONSRATIO$: Onshore to total debt securitization. SID: short-interest differential between local and the US nominal rates. $DEBTSEC$: Ratio of total debt securitization to GDP. $CPIS-IIP$: Foreign holdings on debt. $DERIV$: Turnover of the derivatives market. $STOCKTVR$: Stock market turnover. Also see notes to Table 1.

Table 5: Bond issuance decision

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$SIZE$	0.154***	0.095***	0.088***	0.167***	0.183***	0.164***	0.196***	0.196***
	(36.65)	(15.97)	(14.53)	(17.65)	(17.47)	(16.40)	(18.44)	(18.46)
$GROWTH$	0.065**	0.077*	0.071	0.082*	0.090**	0.082*	0.093**	0.094**
	(2.17)	(1.73)	(1.58)	(1.79)	(1.96)	(1.79)	(2.03)	(2.04)
$YEARS$	0.019***	0.002	-0.001	-0.010**	-0.011***	-0.010**	-0.012***	-0.012***
	(7.24)	(0.43)	(-0.17)	(-2.41)	(-2.78)	(-2.48)	(-3.05)	(-3.06)
$LEVER$	0.732***	0.580***	0.604***	0.628***	0.643***	0.617***	0.673***	0.672***
	(13.15)	(6.96)	(7.26)	(7.41)	(7.59)	(7.21)	(7.83)	(7.82)
$LDEBT$	0.424***	0.390***	0.364***	0.323***	0.311***	0.324***	0.278***	0.280***
	(10.00)	(6.23)	(5.76)	(4.98)	(4.78)	(4.99)	(4.21)	(4.24)
$PROF$	0.486***	0.549***	0.505***	0.476***	0.462***	0.478***	0.480***	0.482***
	(4.61)	(3.72)	(3.42)	(3.06)	(2.97)	(3.08)	(3.06)	(3.07)
$LIQUID$	-0.011	-0.220**	-0.162*	-0.042	-0.016	-0.049	-0.021	-0.020
	(-0.18)	(-2.32)	(-1.70)	(-0.43)	(-0.16)	(-0.50)	(-0.22)	(-0.20)
$COLL$	0.650***	1.016***	0.977***	0.880***	0.882***	0.881***	0.899***	0.892***
	(3.45)	(4.04)	(3.86)	(3.47)	(3.46)	(3.48)	(3.54)	(3.50)
$PREVDOM$		2.442***	2.451***	2.455***	2.455***	2.455***	2.448***	2.449***
		(64.30)	(64.85)	(63.08)	(62.99)	(62.97)	(62.83)	(62.52)
$PREVFOR$		1.736***	1.711***	1.747***	1.744***	1.749***	1.738***	1.739***
		(23.42)	(23.02)	(23.08)	(23.02)	(23.07)	(22.93)	(22.90)
$RATDUM$			0.503***	0.370***	0.340***	0.378***	0.319***	0.320***
			(6.26)	(4.58)	(4.20)	(4.65)	(3.96)	(3.98)
$DEBTSEC$				3.826***	3.887***	3.646***	3.114***	3.059***
				(8.04)	(8.19)	(7.01)	(6.12)	(5.83)
$ONSRATIO$				0.323*	0.159	0.288	0.383*	0.362*
				(1.82)	(0.85)	(1.63)	(1.92)	(1.76)
$STOCKTVR$				-0.209***	-0.213***	-0.210***	-0.232***	-0.229***
				(-6.25)	(-6.38)	(-6.26)	(-6.91)	(-6.77)
SID					-0.028***		-0.035***	-0.036***
					(-3.44)		(-4.26)	(-3.99)
$WITHTAX$						0.041		
						(0.87)		
$CPIS\text{-}IIP$							0.002***	0.002***
							(4.66)	(4.27)
$DERIV$								-0.004
								(-0.41)
$Observations$	20,610	20,610	20,610	20,610	20,610	20,610	20,610	20,610
$R-squared$	0.144	0.592	0.594	0.603	0.604	0.603	0.605	0.605

Notes: The Table reports the effects of the variables listed on the probability to issue bonds by a probit model. The dependent variable is a dummy equal to one if the firm is a bond issuer, and zero otherwise. All models include a time trend. Robust z-statistics in parentheses. All firm-specific variables are lagged one period. Also see notes to Table 1.

Table 6: Bond issuance decision for nonfinancial firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Unseas	Unseas	Unseas	Unseas	Seas	Seas	Seas	Seas
SIZE	0.131***	0.128***	0.152***	0.177***	0.213***	0.185***	0.227***	0.224***
	(4.57)	(4.86)	(5.65)	(6.82)	(16.36)	(14.77)	(16.70)	(16.43)
GROWTH	0.288**	0.283**	0.280**	0.274**	0.078	0.070	0.087	0.089
	(2.18)	(2.14)	(2.10)	(2.08)	(1.25)	(1.13)	(1.39)	(1.42)
YEARS	-0.054***	-0.053***	-0.055***	-0.054***	-0.002	-0.003	-0.003	-0.003
	(-5.57)	(-5.60)	(-5.70)	(-5.76)	(-0.36)	(-0.52)	(-0.64)	(-0.69)
LEVER	0.444**	0.477**	0.476**	0.510**	0.809***	0.749***	0.831***	0.827***
	(2.05)	(2.19)	(2.15)	(2.27)	(6.31)	(5.78)	(6.49)	(6.43)
LDEBT	0.543***	0.550***	0.534***	0.513***	0.372***	0.384***	0.328***	0.337***
	(3.43)	(3.48)	(3.33)	(3.18)	(4.36)	(4.51)	(3.81)	(3.91)
PROF	0.700*	0.717*	0.681*	0.699*	0.304	0.334*	0.327	0.337*
	(1.89)	(1.93)	(1.80)	(1.81)	(1.51)	(1.65)	(1.62)	(1.67)
LIQUID	0.763***	0.721***	0.775***	0.728***	-0.308**	-0.400***	-0.318**	-0.316**
	(3.45)	(3.36)	(3.50)	(3.28)	(-2.44)	(-3.13)	(-2.52)	(-2.50)
COLL	0.003	-0.051	-0.043	0.025	1.209***	1.151***	1.253***	1.197***
	(0.00)	(-0.06)	(-0.05)	(0.03)	(2.82)	(2.69)	(2.92)	(2.77)
RATDUM	0.804***	0.795***	0.766***	0.704***	-0.067	-0.028	-0.083	-0.084
	(8.24)	(8.28)	(8.04)	(7.52)	(-0.58)	(-0.24)	(-0.72)	(-0.72)
DEBTSEC	-1.994	-1.354	-4.019	-3.128	5.141***	4.276***	4.299***	3.962***
	(-1.01)	(-0.66)	(-1.54)	(-1.15)	(7.75)	(5.95)	(6.16)	(5.51)
ONSRATIO	-2.787***	-2.487***	-2.710***	-2.566***	0.948***	0.975***	1.228***	1.061***
	(-5.86)	(-5.38)	(-5.43)	(-5.03)	(3.90)	(4.13)	(4.84)	(4.01)
STOCKTVR	-0.049	-0.041	-0.077	-0.143**	-0.264***	-0.262***	-0.287***	-0.273***
	(-0.67)	(-0.58)	(-1.05)	(-2.03)	(-6.92)	(-6.84)	(-7.36)	(-6.86)
SID	-0.028		-0.042**	-0.029	-0.027***		-0.034***	-0.042***
	(-1.33)		(-2.06)	(-1.38)	(-2.61)		(-3.19)	(-3.68)
WITHTAX		-0.177				0.182***		
		(-1.55)				(3.02)		
CPIS			0.003**	0.001			0.002***	0.002***
			(2.57)	(0.73)			(3.91)	(4.35)
DERIV				0.078***				-0.023**
				(3.87)				(-2.00)
Observations	16,074	16,074	16,074	16,074	3,616	3,616	3,616	3,616
R-squared	0.748	0.748	0.750	0.754	0.136	0.136	0.139	0.140

Notes: The Table reports the effects of the variables listed on the probability to issue bonds by a probit model. The dependent variable is a dummy equal to one if the firm is a bond issuer, and zero otherwise. All models include a time trend. Robust z-statistics in parentheses. All firm-specific variables are lagged one period.

Table 7: Bond issuance decision for financial firms

	(1)	(2)	(3)	(4)
VARIABLES	Seas	Seas	Seas	Seas
SIZE	0.196***	0.185***	0.279***	0.280***
	(2.94)	(2.96)	(3.79)	(3.79)
GROWTH	0.268	0.221	0.251	0.251
	(1.62)	(1.39)	(1.47)	(1.47)
YEARS	-0.006	-0.003	-0.001	0.001
	(-0.28)	(-0.15)	(-0.03)	(0.03)
LEVER	1.001**	1.032***	1.489***	1.466***
	(2.54)	(2.61)	(3.33)	(3.20)
LDEBT	-0.017	-0.010	-0.165	-0.193
	(-0.05)	(-0.03)	(-0.48)	(-0.53)
PROF	2.483**	2.296**	2.684***	2.657***
	(2.53)	(2.42)	(2.70)	(2.66)
LIQUID	-0.358	-0.315	-0.162	-0.180
	(-0.82)	(-0.74)	(-0.36)	(-0.39)
COLL	3.873	3.547	3.650	3.590
	(0.62)	(0.58)	(0.58)	(0.57)
DEBTSEC	10.530***	10.634***	9.030***	9.091***
	(3.83)	(3.92)	(3.21)	(3.25)
ONSRATIO	-1.506	-0.848	-0.202	-0.125
	(-1.37)	(-0.86)	(-0.16)	(-0.09)
STOCKTVR	-0.556*	-0.592*	-0.517*	-0.530*
	(-1.81)	(-1.95)	(-1.70)	(-1.64)
SID	-0.049		-0.038	-0.033
	(-0.98)		(-0.72)	(-0.55)
WITHTAX		-0.121		
		(-0.45)		
CPIS			0.006***	0.006***
			(3.41)	(2.78)
DERIV				0.012
				(0.23)
Observations	221	221	221	221
R-squared	0.183	0.181	0.212	0.212

Notes: The Table reports the effects of the variables listed on the probability to issue bonds by a probit model. The dependent variable is a dummy equal to one if the firm is a bond issuer, and zero otherwise. All models include a time trend. Robust z-statistics in parentheses. All firm-specific variables are lagged one period.

Table 8: Choice of currency

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$SIZE$	0.208***	0.190***	0.214***	0.251***	0.239***	0.258***	0.288***
	(24.42)	(22.10)	(17.08)	(17.66)	(18.09)	(18.61)	(20.84)
$GROWTH$	0.076	0.060	0.057	0.067	0.052	0.064	0.060
	(1.25)	(0.98)	(0.92)	(1.06)	(0.86)	(1.01)	(0.90)
$YEARS$	0.005	-0.001	-0.006	-0.009**	-0.004	-0.009**	-0.007*
	(1.17)	(-0.17)	(-1.28)	(-2.06)	(-1.05)	(-2.11)	(-1.69)
$LEVER$	0.287***	0.366***	0.364***	0.397***	0.456***	0.434***	0.401***
	(2.99)	(3.89)	(3.77)	(4.07)	(4.65)	(4.36)	(3.81)
$LDEBT$	0.453***	0.328***	0.283***	0.258***	0.279***	0.243***	0.235***
	(5.94)	(4.25)	(3.59)	(3.25)	(3.48)	(3.00)	(2.82)
$PROF$	0.190	0.030	0.001	-0.021	0.015	-0.010	-0.062
	(1.00)	(0.16)	(0.01)	(-0.11)	(0.08)	(-0.05)	(-0.29)
$LIQUID$	-0.150	0.034	0.105	0.205*	0.158	0.191	0.158
	(-1.28)	(0.29)	(0.88)	(1.70)	(1.32)	(1.57)	(1.29)
$COLL$	0.946***	0.754**	0.634**	0.641**	0.600**	0.631**	0.646**
	(3.25)	(2.54)	(2.12)	(2.10)	(1.96)	(2.06)	(2.03)
$RATDUM$		0.840***	0.767***	0.701***	0.712***	0.684***	0.639***
		(12.08)	(10.53)	(9.58)	(9.78)	(9.43)	(8.90)
$DEBTSEC$			-0.319	-0.326	0.893	-1.970**	-0.172
			(-0.48)	(-0.51)	(1.14)	(-2.54)	(-0.20)
$ONSRATIO$			-0.735***	-0.998***	-0.551***	-0.830***	-0.801***
			(-3.66)	(-4.98)	(-2.88)	(-3.94)	(-3.73)
$STOCKRVR$			-0.058*	-0.088**	-0.048	-0.108***	-0.146***
			(-1.72)	(-2.57)	(-1.46)	(-3.19)	(-4.60)
SID				-0.054***		-0.060***	-0.040***
				(-5.81)		(-6.46)	(-4.31)
$WITHTAX$					-0.297***		
					(-4.99)		
$CPIS - IIP$						0.002***	-0.001*
						(4.07)	(-1.94)
$DERIV$							0.112***
							(11.28)
Observations	20,610	20,610	20,610	20,610	20,610	20,610	20,610
$R-squared$	0.242	0.267	0.271	0.277	0.275	0.280	0.295

Notes: The Table reports the effects of the variables listed on the probability to issue a foreign bond by a probit model. The dependent variable is a dummy equal to one if the firm has issued in foreign currency, and zero otherwise. All models include a time trend. Robust z-statistics in parentheses. All firm-specific variables are lagged one period. Also see notes to Table 1.

Table 9: Choice of currency for nonfinancial firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Unseas	Unseas	Unseas	Unseas	Seas	Seas	Seas	Seas
SIZE	0.176***	0.162***	0.209***	0.280***	0.277***	0.253***	0.275***	0.297***
	(5.07)	(5.06)	(5.49)	(6.22)	(9.73)	(10.19)	(9.85)	(10.17)
GROWTH	0.250	0.236	0.234	0.249	-0.123	-0.125	-0.127	-0.135
	(1.31)	(1.23)	(1.23)	(1.31)	(-0.98)	(-1.07)	(-1.01)	(-1.04)
YEARS	-0.084***	-0.082***	-0.088***	-0.098***	0.003	0.009	0.003	0.003
	(-4.89)	(-4.95)	(-5.11)	(-5.39)	(0.31)	(1.08)	(0.31)	(0.36)
LEVER	-0.052	-0.007	-0.043	-0.112	0.446**	0.467**	0.426**	0.408*
	(-0.16)	(-0.02)	(-0.13)	(-0.32)	(2.28)	(2.36)	(2.13)	(1.94)
LDEBT	0.493**	0.495**	0.518**	0.463**	0.258	0.297*	0.268	0.282*
	(2.26)	(2.26)	(2.36)	(2.02)	(1.55)	(1.79)	(1.60)	(1.68)
PROF	0.178	0.226	0.101	-0.075	-0.066	-0.053	-0.077	-0.119
	(0.33)	(0.42)	(0.19)	(-0.15)	(-0.17)	(-0.14)	(-0.20)	(-0.29)
LIQUID	0.358	0.274	0.401	0.267	-0.090	-0.139	-0.083	-0.048
	(1.08)	(0.83)	(1.20)	(0.78)	(-0.37)	(-0.58)	(-0.35)	(-0.21)
COLL	-1.018	-1.143	-0.812	-0.761	0.579	0.605	0.586	0.697
	(-0.85)	(-0.95)	(-0.68)	(-0.67)	(0.94)	(0.98)	(0.95)	(1.09)
RATDUM					0.349***	0.381***	0.348***	0.342***
					(3.30)	(3.63)	(3.28)	(3.22)
DEBTSEC	-7.657***	-6.540***	-11.165***	-9.323***	0.315	1.682	1.050	3.399*
	(-3.80)	(-2.91)	(-4.96)	(-4.07)	(0.22)	(1.02)	(0.62)	(1.72)
ONSRATIO	-3.420***	-2.960***	-3.121***	-2.736***	-0.012	0.335	-0.148	-0.143
	(-4.58)	(-4.01)	(-4.12)	(-3.66)	(-0.03)	(0.72)	(-0.29)	(-0.29)
STOCKTVR	-0.195**	-0.162*	-0.261**	-0.414***	-0.171***	-0.099*	-0.159***	-0.163***
	(-1.96)	(-1.72)	(-2.47)	(-3.60)	(-2.81)	(-1.74)	(-2.68)	(-3.02)
SID	-0.056*		-0.080**	-0.064*	-0.065***		-0.062***	-0.047***
	(-1.92)		(-2.49)	(-1.76)	(-4.15)		(-3.93)	(-2.95)
WITHTAX		-0.249				-0.327***		
		(-1.39)				(-2.61)		
CPIS			0.004***	0.000			-0.001	-0.004**
			(2.79)	(0.21)			(-0.75)	(-2.16)
DERIV				0.227***				0.118***
				(4.96)				(3.84)
Observations	516	516	516	516	3,616	3,616	3,616	3,616
R-squared	0.217	0.214	0.227	0.275	0.273	0.268	0.274	0.283

Notes: The Table reports the effects of the variables listed on the probability to issue a foreign bond by a probit model. The dependent variable is a dummy equal to one if the firm has issued in foreign currency, and zero otherwise. All models include a time trend. Robust z-statistics in parentheses.

Table 10: Debt structure

	(1) OLS	(2) OLS	(3) Tobit	(4) Tobit
$SIZE$	-0.001	-0.001	0.028***	0.026***
	(-0.48)	(-0.41)	(3.22)	(3.18)
$GROWTH$	0.010	0.010	0.025	0.007
	(0.94)	(0.94)	(0.49)	(0.14)
$PROF$	-0.038	-0.039	-0.499***	-0.447***
	(-1.51)	(-1.56)	(-2.91)	(-2.70)
$LIQUID$	-0.007	-0.012	0.041	0.023
	(-0.41)	(-0.65)	(0.45)	(0.25)
$MTBOOK$	0.0004	-0.0004	-0.029	-0.034
	(0.26)	(-0.48)	(-0.98)	(-1.15)
$RATDUM$	-0.001	-0.002	0.027	0.002
	(-0.08)	(-0.24)	(0.64)	(0.05)
$COLL$	0.049	0.041	0.191	0.226
	(0.72)	(0.59)	(0.81)	(0.98)
$FCDUM$	0.008	0.008	0.081**	0.085**
	(1.21)	(1.22)	(2.06)	(2.22)
$DEBTSEC$	-0.395	-0.298	-0.974	-1.057
	(-1.10)	(-0.86)	(-1.01)	(-1.07)
$ONSRATIO$	0.048	0.073	0.209	0.400
	(1.02)	(1.41)	(0.78)	(1.40)
$STOCKTVR$	-0.010***	-0.008**	-0.076***	-0.070***
	(-2.66)	(-2.50)	(-2.72)	(-2.68)
SID	-0.001**		-0.024***	
	(-2.01)		(-2.59)	
$WITHTAX$		-0.023		-0.149*
		(-1.58)		(-1.66)
$CPIS$	0.0004**	0.0004**	0.002***	0.002***
	(2.23)	(2.29)	(4.98)	(5.78)
$DERIV$	0.006	0.004	0.007	-0.002
	(1.35)	(0.89)	(0.65)	(-0.13)
Observations	802	802	802	802
Left censored obs			686	686
$R-squared$	0.090	0.091		

Notes: Columns 1 and 2 report OLS estimates, while columns 3 and 4 Tobit estimates. The dependent variable is the ratio of foreign currency bonds to total liabilities. All models include a time trend. Robust z-statistics in parentheses. Also see notes to Table 1.