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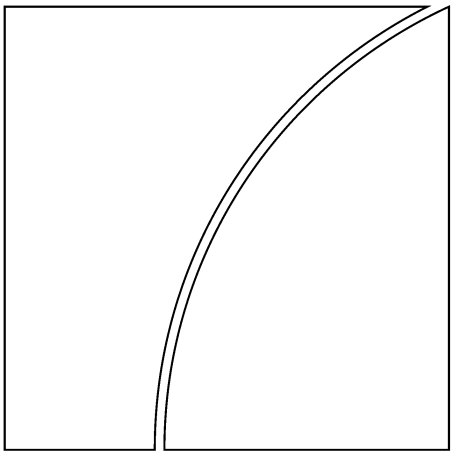

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Monetary and Economic Department

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

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Abstract

Corporate bond issuers in emerging economies in Asia have often had a choice between an onshore market and an offshore one. Since 1998, however, many of these issuers have increasingly turned to the onshore market. This paper investigates systematically what factors have influenced this choice between markets for issuers in eight emerging economies – China, Hong Kong SAR, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. For variables measuring market depth and liquidity, the availability of hedging instruments, and the size of 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. We control for variables representing agency, static trade-off and risk management theories of the capital structure. Our results show that the choice between domestic and foreign markets has changed over time in large part because of the increased depth of the onshore market. The firms that benefit from such market development tend to be the unseasoned issuers rather than the seasoned ones.

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

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

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1 Introduction

Why do firms in emerging markets so often issue bonds abroad? Is this purely an attempt to reach global markets that are inherently deeper and more liquid, or do the inefficiencies of domestic markets lend an advantage to issuing abroad? Would the growth of local corporate bond markets increase the viability of large-scale onshore issuance for emerging market firms? And to what extent could overall financial market development - especially for onshore markets - be a driver of where firms decide to issue?

The literature is clear that firm characteristics have a role to play in that decision, by predisposing some firms to seek finance offshore 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. Goldstein and Turner (2004) argue that it was weakness in economic policies and institutions in emerging market countries themselves - not imperfections in international capital markets - that inhibit 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. Better policies in emerging markets have indeed favored the major development of emerging markets' local currency bond markets, particularly government debt. The markets for small bonds proved remarkably resilient during the financial crisis, although the development of corporate debt has lagged behind that of government debt (Turner (2012)). Miyajima et al. (2012) have shown that emerging market economies local currency government bonds now more closely resemble international assets regarded as "safe", particularly following the euro

area debt crisis.

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 global 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 area. Even in the case of 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 non-investment grade 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 bond market and an already large offshore bond market. The offshore market has been deep and liquid from the outset, while the onshore markets in the region have tended to grow in size and provide 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 domestic 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.

From looking at the record of individual companies, it is clear that there is no one-size-fits-all template for the path of onshore versus offshore issuance. We do find firms that issue only in onshore markets, or issue in onshore markets before going offshore. But at the same time, 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 (Table 1).

In general, however, we find that over time both the proportion of issues in the onshore market as well as the relative quantity of issuance in the onshore market have increased markedly, especially for firms in China, Korea, Hong Kong SAR, the Philippines and Singapore (Table 2). In fact, since 1998, issuance in the onshore market for our sample firms has grown faster than issuance in the offshore market every year. This is consistent with the paper's results that the choice to issue is strongly influenced by market depth and liquidity, which have also increased in Asian onshore markets over the sample period. Interestingly, it is the younger, unseasoned firms that are more likely to come home to the onshore market once domestic markets become deep and liquid enough.

Our paper also provides guidance on an important policy goal of governments in emerging Asia, the active development of onshore bond markets. Over the past decade, authorities in emerging Asian economies have launched a variety of projects to promote onshore bond markets, including the Asian Bond Fund 2 (ABF2) of 12 major central banks in the Asia-

Pacific region, administered by the BIS. These initiatives have been catalysts for reform of market practice and regulation, including the creation of mechanisms to mitigate the costs of information asymmetries, increase liquidity in secondary bond markets, and establish active FX hedging markets.

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. In section 3 we describe the empirical methodology of our study, and in Section 4 our data. Sections 5 and 6 report the results on the decision to issue bonds, the choice to issue offshore bonds, and the implications for capital structure. Section 7 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 should be 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 with 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); 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)); 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 may 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 external markets. Allayannis et al. (2003) also argues that foreign currency debt will complement 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 the depth and liquidity of bond markets may not be as great as in foreign markets. Allayannis et al. (2003) and Chan et al. (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 struc-

ture 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); 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) find

[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.

the level of foreign interest rates to be an important factor in their survey of firms issuing foreign bonds. Cohen (2005) also finds that interest rate differentials 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 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 SAR, Korea, Japan 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. A major focus of the BIS report was on the determinants of liquidity, and on the policies that could enhance liquidity (BIS (2007)). 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 (Mizen and Tsoukas (2010); Chan et al. (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

[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 (Chan et al. (2011)).

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 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 Chan et al. (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. Chan et al. (2011) 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.

The third 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.[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

[3]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 Munro and Wooldridge (2010).

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 Munro and Wooldridge (2010); Habib and Joy (2010)). Interestingly, Mehl and Reynaud (2005) find that in emerging economies lack of local currency debt in derivatives markets is not intrinsic 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. 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 as to whether use is made of foreign currency bonds or 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 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. 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 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.

Characteristics of the specific bonds themselves are also used in a number of studies

(e.g. Munro and Wooldridge (2010)), such as the issue size, credit quality, sector, maturity, coupons, and whether there are single or multiple issues. For example, Black and Munro (2010) 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.

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 onshore or offshore markets? Second, how do these factors influence the decision to issue in offshore markets compared with the decision to issue in onshore and offshore markets 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 in the first place, irrespective of the choice of market. The natural empirical method to evaluate this decision is the probit model, which determines the probability that a firm will issue a bond 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 markets, in country j, in year t, and zero 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.

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

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 (SID_{jt}) to be more important compared with the previous model that included both domestic and foreign market issues. Similarly, higher withholding taxes ($WITHTAX_{jt}$) 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 ($ONSRATIO_{jt}$) is also likely to be important, because it measures the incentives to issue in domestic markets.

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 our 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 to 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 issue bonds, 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 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 employed in the previous equations, but 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 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.[4] 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 ($SIZE_{ijt}$), we calculate the logarithm of the firm's total assets consistent with Calomiris et al. (1995). We also measure investment over total assets ($INVA_{ijt}$) 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).

[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.

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 market in the following way. We employ the ratio of debt securities issued onshore to 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 BIS (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 Chan et al. (2011).

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

[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.

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.

4.2 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, seasoned issuers and starters, and financial and non-financial firms 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 the same information as well as market indicators broken out into individual countries.

Table 3 reveals that domestic issuers are smaller, less levered and more profitable, and have smaller investment needs than foreign issuers. Domestic bond markets require less of domestic issuers in terms of firm size and investment characteristics, and favor firms that have lower debt and greater profitability. The fact that larger firms issue in foreign markets 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 the 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 make domestic bond issuance more attractive.

Firms that are seasoned tend to be larger, slightly more levered and less liquid and to hold more collateral. These are the cases where the mean values are significantly different with p-values that reject the null of equality, but in other respects they are very similar

and do not reject the null. Financials too have greater size than non-financials, a lower investment to total asset ratio, fewer liquid assets, and they are generally less profitable. In fact in all respects they have significantly different mean values compared to non-financials, since on every metric the null of equality in the means is rejected.

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 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 Allayannis et al. (2003) 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.

5 Results

Our empirical analysis proceeds in two steps. First, we identify the factors that induce firms in Asia to raise funds by issuing bonds. Then for the firms that do issue, we consider how they choose between onshore and offshore markets. In both cases, we expect the degree of market development to matter, albeit in somewhat different ways.[6] To a firm that has already decided to raise external funds, the decision to issue a bond - rather than borrow from a bank or issue more stock - would be easier if either or both bond markets were accessible, which would depend on how deep and liquid these markets were.[7] Once the firm has decided to issue a bond, the choice between the onshore and offshore market would then depend on which market provides better terms, something that depends on how well developed one market is relative to the other as well as on the specific characteristics of the firm itself. In analyzing both decisions, we consider whether there is a difference between the behavior of seasoned issuers and that of unseasoned issuers and also whether there is a similar difference

[6]While we focus on the degree of market development, Burger and Warnock (2006) and Eichengreen et al. (2006) point to the importance of macroeconomic factors.

[7]In the process, following Rajan and Zingales (1995), Demirguc-Kunt and Maksimovic (1999), Booth et al. (2001), and Allayannis et al. (2003) we shed light on capital structure considerations.

between financial firms and non-financial firms. This sheds light on the question of which firms would tend to benefit from market development.

5.1 The decision to issue a bond

We model the decision to issue a bond as something that is influenced by both market-wide variables and firm-specific characteristics. Our findings are reported in Table 5. Those related to firm-specific characteristics are very similar to the results reported in Mizen and Tsoukas (2010), so we will discuss these results only briefly before moving on to consider the influence of market-wide variables.

5.1.1 Firm-specific characteristics

In our sample of Asian firms, size and track record seem to matter more for the likelihood that a firm will issue a bond than does the firm's growth. We find the coefficient on SIZE to be positive and significant, as it is in other studies, e.g. Calomiris et al. (1995). We indicate how long a firm has been listed on a stock exchange using the age variable (YEARS). Since this is a proxy for the length of a firm's track record, the variable should have a positive sign and it does, suggesting that the firm can access markets more easily the more familiar investors are with it. On the other hand, 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. We measure the expansion rate by investment over total assets (INVA). We find that this is not a significant determinant of bond issuance. Hence, factors that are related to the ability to overcome information asymmetries - such as size and track record - are more important.

The financial condition of the firm is also a well established determinant of access to external finance, as argued by Leland and Pyle (1977), Myers and Majluf (1984), Rajan (1992) and Pagano et al. (1998). Here, we consider leverage, profitability, and liquidity in total assets as indicators of creditworthiness on the balance sheet. As noted in our discussion

of the literature, high leverage can be associated with a capital structure that already has too much debt, but equally leverage can be a signal of good credit standing in the past (see Pagano et al. (1998); Datta et al. (2000); Dennis and Mihov (2003)). Here we find that coefficients on LEVER are positive and strongly significant, confirming the second view. In the case of profitability, we also estimate coefficients on PROF that are positive and strongly significant, consistent with Dennis and Mihov (2003) and Allayannis et al. (2003). In the case of liquidity, we find that the liquidity ratio (LIQUID) has a consistently negative effect on issuance, suggesting that liquid firms do not need to issue debt to raise funds for investment and growth.

The agency theory of debt suggests that tangible assets can serve as collateral to reassure investors and thus positively influence bond issuance even for unsecured bonds (see, for example, Allayannis et al. (2003)). Investors (particularly foreign investors) have limited ability to monitor the firm, and the existence of tangible assets indicates that there are assets to seize in the case of default. Hence, our results for collateral assets (COLL) indicate a large positive influence on the probability of issuance. Information asymmetries underlying the agency theory seem to be greater for Asian firms, and the significance and strength of this effect in our results indicate the importance of overcoming these asymmetries.

To further explore the importance of information asymmetries, we exploit a variable indicating previous issuance used by Mizen and Tsoukas (2010). In this case, we consider separately whether the firm had previously issued in the domestic market (PREVDOM) and whether it had done so in the foreign market (PREVFOR). As shown in Table 4, the coefficients on these variables are positive and strongly significant, 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).

5.1.2 Market indicators and the decision to issue

We now turn to the main variables of interest, namely the variables that capture the impact of the degree of market development on the probability of bond issuance. These variables measure the size of the bond markets, specifically the size of the onshore and offshore markets together relative to GDP and the size of one market relative to the other. Other variables measure the cost conditions in those markets, the activity in the stock market as an alternative place to raise funds, the size of the foreign investor base, the existence of a withholding tax, and the availability of derivatives for hedging purposes. Table 5 reports our estimates for various combinations of these variables.

We find that the market scale measure (DEBTSEC), is highly significant and has a rather large positive coefficient. This supports the market depth hypothesis. At the same time, the size of the onshore market relative to the offshore market (ONSRATIO), has a positive effect but is significant at the 10% level in only half of the cases. Hence, the decision to issue depends largely on whether at least one market is deep and liquid. As we shall see, it is when it comes to the choice of market that the relative size of the onshore market really matters.

We include a measure of the turnover in the stock market (STOCKTVR). This is in part a test of the pecking order theory and the static trade-off theory because firms may prefer to raise funds in the stock market rather than in bond markets, especially if the stock market is fairly active. We expect and find a negative sign that suggests that a stock market with higher turnover provides a more attractive substitute for issuance in the bond market.

We also consider the interest differential between the onshore and offshore market. Here SID is defined as the local nominal interest rate minus the foreign nominal interest rate. As shown in column 5 of Table 5, SID shows a negative sign, confirming a result reported in Miller and Puthenpurackal (2002). This suggests a degree of opportunism in the timing of issuance. Firms are more likely to issue when the nominal interest rate is low relative to the foreign one. The choice of a short maturity for the interest differential 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 market 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 disincentives from a 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 local currency bonds, and provides evidence in favor of the static trade-off theory.

The final variable in Table 5 is the size of the foreign exchange swaps, derivative and options market (DERIV) in each country. We expect this to raise the probability of issue consistent with the static trade -off and the risk management theories since a larger volume of swaps, derivatives and options turnover tends to provide a greater opportunity for firms to hedge their exchange rate exposure. We find tehre is a positive coefficient but it is not significant in this model.

5.2 Which firms gain from market development?

Market development is beneficial if it leads to greater access to financing for a greater number of firms in an economy, but there may be some types of firms that benefit more than others from market development. Hence, we now divide our firms into seasoned and unseasoned issuers and into financial and non-financial firms. We explore whether unseasoned issuers are more likely to decide to issue when bond markets are more developed compared with seasoned issuers. We anticipate that financial firms, by their nature, are likely to rely more regularly on bond markets than non-financial firms.

These breakdowns do not seem to matter for the effect of firm-specific characteristics. Across all firm types, the larger ones tend to be more likely to issue, as do those with higher investment ratios. Leverage has a consistently positive effect on issuance. Some differences do tend to be observed in the sensitivity to indicators such as profitability, liquidity and collateral which affect unseasoned non-financial firms much more than seasoned financial and non-financial firms. These details are reported in the full tables found in the Appendix.

It is interesting that the market development variables do distinguish sharply between the different types of firms. Table 6 reports our estimates of the probability-to-issue model for seasoned versus non-seasoned firms. Columns 1-4 refer to non-financial firms, and columns 5-8 refer to financial firms. The interaction for seasoned firms (SEAS) is used to separate previous issuers from unseasoned firms (1-SEAS). The results are quite striking. As expected, the depth of the markets (DEBTSEC) affects unseasoned issuers much more than seasoned issuers. The same variable has a large positive and significant effect irrespective of whether we are looking at financial or non-financial firms. Equally striking, the relative size of the onshore market positively affects only unseasoned issuers and it does so at high levels of significance. Hence, in deciding whether to issue, unseasoned issuers look more to the onshore market than the offshore one. In other words, market development matters more for unseasoned than for seasoned issuers.

Seasoned issuers are more likely to be influenced by the existence of an active stock market. The significance of the turnover variable implies that the choice between equity and bonds is one that is more open for seasoned bond issuers than for unseasoned issuers.

Variables that influence the incentives to issue, such as short interest differentials and tax treatment, tend to influence unseasoned issuers and do not affect seasoned issuers at all. Similarly, the size of the foreign investor base matters more for unseasoned issuers. Thus most of the support for the static trade-off and risk management theories comes from firms that have not previously issued in the bond market. Once a firm has issued, our results suggest that they are not that strongly swayed by opportunistic incentives.

6 The choice between the onshore and offshore bond market

Once a firm has decided to issue, it is important to know how it chooses the market in which it issues. To what extent does market development affect this choice? Hence, we now examine what factors influence the firm's choice between onshore and offshore debt for those firms that did issue bonds. To construct our dependent variable, we use the variable FOREIGN, which takes the value of one if the bond is issued in the offshore market and zero otherwise. The sample is smaller in Table 7 compared with the previous set of results reported in Tables 5 and 6, because we are now only considering issuers. The results show that market choice is driven by a much smaller set of variables.

6.1 Firm-specific characteristics and the choice of market

We find that larger firms are more likely to issue in the offshore market. As shown in columns 1-5 of Table 7, the SIZE variable proves to be consistently important in all our specifications. This is an interesting result but one that is difficult to interpret by itself. The result may suggest that information asymmetries are sharper in the offshore market than in the onshore one. In some respects, this makes sense because investors in the onshore market would naturally be more familiar with the smaller firms than would investors in the offshore market. In general, the fixed costs of issuing abroad seem to be higher than the fixed costs of issuing at home, hence larger firms issuing larger bonds would be better able to absorb the fixed costs of issuing abroad. In addition, Allayannis et al. (2003) note that the statistical significance of a size variable may indicate that there may be large bond issues that exceed the capacity of the onshore market to finance. To the extent that a larger size reduces the costs of access to foreign markets, there may also be support for the static trade-off theory.

If issuing firms face sharper information asymmetries abroad, the advantage of size should suggest a similar advantage to a long track record for issuing offshore. Instead we find that

older firms, as measured by YEARS, tend to issue onshore rather than offshore. The fact that the offshore market tends to be deeper and more liquid seems to be an advantage to younger firms, but older firms may not need such advantages once they are already firmly established.

6.2 Market indicators and the choice of market

The market indicators reveal that the absolute size of the market is a very significant factor in determining whether an issuer will go to the onshore or to the offshore market. We find that the relative size of the onshore market, as measured by (ONSRATIO), is an important determinant of the decision to issue onshore. A relatively large onshore market reduces the probability of the foreign issue. We also find that DEBTSEC, or overall market size, has a large positive influence on onshore versus offshore issuance (a negative coefficient), suggesting that overall market depth is more important to improving the likelihood of domestic than offshore issuance, perhaps because domestic markets were less established and much more rapidly developing over the period. Both findings together can also be interpreted as a test of the pecking order hypothesis and static trade-off theory, since firms will access the domestic bond market if there is sufficient scale and they tend to do so in preference to the foreign market. This is because the costs of issue are likely to be lower locally and the local investors are likely to be more familiar with the issuers than investors in foreign markets. Firms issue offshore market 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 also support the static trade-off and risk management theories. The absolute size of the coefficients on these variables in columns 3-5 of Table 7 reveals 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 7 report the incentives to issue

in offshore 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 with a much larger coefficient in Table 7 than in Table 5, which shows tax treatment to be more important to issuers in foreign markets compared with all issuers in domestic and foreign markets. Therefore, firms issue less in offshore markets if the interest rate costs are higher in offshore markets, and they issue less if the withholding tax treatment creates additional disincentives for foreign investors to participate in bond purchases. The effect of the interest differential also suggests that issuers do not believe in uncovered interest parity. They do not think that exchange rates will move to offset the interest differential.

The size of the swaps and derivatives markets has a positive and significant effect in column 5 of Table 7 as expected, since the ability of firms to hedge their positions, supporting the risk management theory, is bound to make offshore issuance more attractive. This effect also has a high level of significance compared with the previous table, suggesting that the scale of the derivatives market is very important for the decision to issue in an offshore market. Issuers find it important to be able to easily transform payments from one currency into another. 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.

6.3 Which firms benefit from a developed onshore market?

A clearer picture emerges when we distinguish between seasoned and unseasoned issuers and between financial and non-financial firms. When we consider the same breakdown in Table 8, again controlling for firm characteristics, we find that different factors influence the choice between offshore and onshore markets. All firms in this table are issuers, some for the first time (1-SEAS) and others after many previous issues. The absolute size of the market

(DEBTSEC) has a negative effect on offshore issuance only for unseasoned non-financial firms. These firms are influenced the most by market depth.

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. As we saw in Table 1 earlier, this is the case over the sample period for Korean firms such as Jinro, Hanbo Steel, LS Cable and LG Telecom. This was also the case for banks in Thailand, Malaysia and the Philippines, such as Bangkok Dusit, Public Bank Berh and Metro Bank.

Once they become more seasoned, it often makes sense for firms to shift to the onshore market. The relative size of onshore versus offshore markets (ONSRATIO) influences financial and non-financial firms that are unseasoned, causing them all to issue less offshore and more onshore. But the variable ONSRATIO does not affect seasoned issuers of any type, suggesting that once they have sunk costs in a particular market they have an incentive to continue to issue there. Within our sample, as documented in Table 1, there were many examples of firms that exclusively issued in an offshore market during the sample period, including Cathay Pacific, Daewoo, Samsung Electronic, Singapore Telephone and Hong Kong Mass Rapid Transit, in addition to those that issued only onshore, e.g. Asiana Air, Hotel Properties and Petra Perdana (Table 1).

The opportunistic factors, such as interest differentials and withholding tax, reduce offshore issuance. They affect firms of all types, but tend to be more influential over seasoned financial firms. This might account for the examples we found of companies that initially issued in domestic currency but subsequently issue in offshore markets, e.g. the banks China Merchant Bank, China Construction Bank, Hang Seng Bank and Bank Thai (Table 1). The size of the swaps and derivatives markets has a positive and significant effect on seasoned and unseasoned non-financial firms, increasing the desirability of offshore issuance when they have markets in which to hedge their positions, supporting the risk management theory.

6.4 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 to the measures used by Allayannis et al. (2003) and Faulkender and Petersen (2006). 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 now examine the capital structure theories in detail in Table 9.

Our first two columns in Table 9 report estimated results using OLS. We find that none of the firm-level variables is statistically significant.[8] 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 ($WITHTAX$), 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 ($CPIS\text{-}IIS$) 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 that 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 of the prediction of the pecking order theory, which argues that *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

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

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 short interest differential (SID), and scale of foreign investor participation ($CPIS\text{-}IIS$) 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.

7 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.

What difference have such reforms made to the actual financing decisions of firms in the region? For many such borrowers, deep and liquid offshore markets have long provided financing for debt denominated in US dollars or euros. How do firms decide between offshore and onshore 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. 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 onshore. Once the depth of the market was increased via withholding tax exemptions for non-residents, corporations were more likely to issue onshore 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 derivatives markets in different currencies. The size of currency hedging markets in each country - including FX swaps, currency swaps and options markets 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 particular, 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 fact we found the opposite.

7.0.1 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 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 non-resident 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.

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Table 1: Different corporate bond issuance patterns (1995-2007): Selected sample firms

	Jurisdiction	Industry
Firms that only issue offshore		
Cathay Pacific	Hong Kong SAR	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 SAR	Transportation
Firms that only issue onshore		
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 offshore		
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 onshore and then offshore		
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 2: Corporate bond issuance in sample economies (1995-2007)

	No of Issues	No of offshore bonds	Offshore bonds as % of total	Amount of Issuance (Bn USD)	Amount offshore bonds (Bn USD)	Offshore bonds as % of total
China						
1995-2003	4	3	75	1	0.2	20
2004-2007	46	25	54	91	11	12
Hong Kong SAR						
1995-2003	6	2	30	1.2	0.4	33
2004-2007	23	6	26	28	2.8	10
Indonesia						
1995-2003	13	8	61	12.5	2.5	20
2004-2007	21	6	28	66	12.6	19
Korea						
1995-2003	69	48	69	7.32	4.9	67
2004-2007	88	58	65	24.31	6.5	27
Malaysia						
1995-2003	53	2	4	1.82	0.1	5.5
2004-2007	66	2	3	8.62	0.9	10
Philippines						
1995-2003	14	12	85	10	6	60
2004-2007	29	9	31	38	16	42
Singapore						
1995-2003	32	15	47	74	41	55
2004-2007	46	16	35	113	55	49
Thailand						
1995-2003	36	20	55	75	16	21
2004-2007	50	19	38	69	32	46

Table 3: Summary statistics for the firm-specific variables

	All firms (1)	Domestic (2)	Foreign (3)	Diff. (4)	Seasoned (5)	Unseasoned (6)	Diff. (7)	Financials (8)	Non-Financials (9)	Diff. (10)
$SIZE$	15.298	15.185	19.222	0.000	18.862	15.207	0.000	16.215	15.119	0.000
	(3.28)	(3.21)	(3.08)		(3.46)	(3.22)		(3.22)	(3.26)	
$INVA$	0.054	0.053	0.059	0.110	0.055	0.054	0.754	0.034	0.057	0.000
	(0.10)	(0.11)	(0.09)		(0.09)	(0.10)		(0.11)	(0.10)	
$YEARS$	13.668	13.687	13.017	0.344	13.635	13.612	0.155	13.961	13.612	0.000
	(4.67)	(4.68)	(4.41)		(4.66)	(4.88)		(4.35)	(4.73)	
$LEVER$	0.268	0.266	0.339	0.000	0.308	0.267	0.000	0.205	0.281	0.000
	(0.25)	(0.25)	(0.24)		(0.23)	(0.25)		(0.24)	(0.25)	
$PROF$	0.031	0.032	0.022	0.019	0.028	0.032	0.447	0.011	0.035	0.000
	(0.14)	(0.14)	(0.11)		(0.10)	(0.14)		(0.12)	(0.14)	
$LIQUID$	0.462	0.465	0.361	0.544	0.385	0.464	0.000	0.389	0.476	0.000
	(0.22)	(0.21)	(0.19)		(0.20)	(0.23)		(0.26)	(0.21)	
$COLL$	0.025	0.025	0.026	0.565	0.026	0.019	0.000	0.011	0.028	0.000
	(0.06)	(0.05)	(0.06)		(0.06)	(0.04)		(0.04)	(0.06)	

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. $INVA$: Investments over total assets. $YEARS$: 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.

Table 4: Summary statistics by country

	China	Hong Kong SAR	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
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)
$INVA$	0.062	0.052	0.055	0.061	0.048	0.047	0.052	0.060
	(0.11)	(0.11)	(0.11)	(0.11)	(0.09)	(0.12)	(0.10)	(0.10)
$YEARS$	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)
$ONSRATIO$	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)
$CPIS\text{-}IIP$	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. $CPIS\text{-}IIP$: Foreign holdings on debt. $DERIV$: Turnover of the derivatives market. $STOCKTVR$: Stock market turnover. See also notes to Table 3.

Table 5: Bond issuance decision

	(1)	(2)	(3)	(4)	(5)	(6)
$SIZE$	0.132***	0.084***	0.161***	0.135***	0.169***	0.169***
	(43.77)	(20.02)	(23.62)	(22.43)	(24.31)	(24.41)
$INVA$	0.142	0.057	0.181	0.112	0.198	0.197
	(1.60)	(0.47)	(1.45)	(0.91)	(1.58)	(1.58)
$YEARS$	0.019***	0.001	-0.010***	-0.005	-0.011***	-0.011***
	(8.76)	(0.41)	(-3.01)	(-1.40)	(-3.36)	(-3.34)
$LEVER$	0.537***	0.571***	0.663***	0.628***	0.686***	0.686***
	(14.12)	(10.38)	(11.67)	(11.10)	(11.97)	(11.95)
$PROF$	0.592***	0.793***	0.796***	0.858***	0.807***	0.806***
	(7.70)	(6.82)	(6.49)	(7.10)	(6.52)	(6.51)
$LIQUID$	-0.399***	-0.519***	-0.308***	-0.395***	-0.307***	-0.308***
	(-9.36)	(-8.21)	(-4.67)	(-6.11)	(-4.64)	(-4.66)
$COLL$	0.328**	1.044***	1.050***	1.050***	1.054***	1.061***
	(2.15)	(5.09)	(5.10)	(5.16)	(5.13)	(5.16)
$PREVDOM$		2.417***	2.424***	2.422***	2.421***	2.421***
		(87.62)	(85.79)	(86.55)	(85.61)	(85.62)
$PREVFOR$		1.630***	1.626***	1.643***	1.619***	1.618***
		(29.22)	(28.61)	(29.09)	(28.45)	(28.44)
$DEBTSEC$			3.695***	4.520***	2.876***	2.952***
			(10.14)	(11.67)	(7.30)	(7.25)
$ONSRATIO$			0.188*	0.204*	-0.014	-0.005
			(1.66)	(1.91)	(-0.11)	(-0.04)
$STOCKTVR$			-0.141***	-0.074***	-0.148***	-0.148***
			(-6.84)	(-3.95)	(-7.17)	(-7.18)
SID			-0.037***		-0.037***	-0.036***
			(-9.40)		(-9.17)	(-8.93)
$WITHTAX$				-0.122***		
				(-3.27)		
$CPIS$					0.002***	0.002***
					(6.26)	(5.27)
$DERIV$						0.005
						(0.74)
Observations	35,870	35,870	35,870	35,870	35,870	35,870
R-squared	0.11	0.58	0.59	0.59	0.59	0.59

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. *significant at 10 %; ** significant at 5 %; *** significant at 1 %.

Table 6: A more detailed breakdown for bond issuance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	non-fin	non-fin	non-fin	non-fin	fin	fin	fin	fin
*DEBTSEC*SEAS*	2.047	2.373	2.574	3.117	-3.708	-4.879*	-3.796	-4.167
	(1.07)	(1.26)	(1.18)	(1.41)	(-1.43)	(-1.70)	(-1.46)	(-1.63)
*DEBTSEC**(1-*SEAS*)	4.758***	5.344***	3.622***	3.671***	4.048***	4.077***	3.468***	3.902***
	(17.00)	(16.93)	(11.97)	(11.51)	(7.55)	(7.20)	(6.14)	(6.63)
*ONSRATIO*SEAS*	-0.551	-0.670	-0.182	-0.227	-0.891	-1.104	-0.920	-0.834
	(-1.03)	(-1.26)	(-0.34)	(-0.43)	(-1.04)	(-1.37)	(-1.07)	(-0.98)
*ONSRATIO**(1-*SEAS*)	0.069	0.454***	0.355***	0.365***	1.210***	1.313***	1.306***	1.305***
	(0.78)	(5.30)	(3.72)	(3.85)	(8.00)	(8.50)	(8.48)	(8.46)
*STOCKTVR*SEAS*	-0.247***	-0.226***	-0.277***	-0.289***	-0.535***	-0.629***	-0.511***	-0.508***
	(-3.51)	(-3.18)	(-3.87)	(-4.00)	(-3.00)	(-3.75)	(-2.75)	(-2.72)
*STOCKTVR**(1-*SEAS*)	-0.008	0.061***	-0.019	-0.019	-0.064*	-0.003	-0.063	-0.063*
	(-0.52)	(4.29)	(-1.22)	(-1.24)	(-1.66)	(-0.08)	(-1.64)	(-1.66)
*SID*SEAS*	-0.007		-0.009	-0.008	-0.023		-0.026	-0.032
	(-0.43)		(-0.58)	(-0.50)	(-0.52)		(-0.59)	(-0.70)
*SID**(1-*SEAS*)	-0.039***		-0.039***	-0.039***	-0.022***		-0.021***	-0.018***
	(-9.68)		(-9.33)	(-9.16)	(-3.49)		(-3.34)	(-2.97)
*WITHTAX*SEAS*		0.017				0.432*		
		(0.09)				(1.65)		
*WITHTAX**(1-*SEAS*)		-0.079**				0.057		
		(-2.58)				(0.98)		
*CPIS*SEAS*			-0.000	-0.002			0.001	0.002
			(-0.18)	(-1.15)			(0.62)	(0.93)
*CPIS**(1-*SEAS*)			0.002***	0.002***			0.001***	0.001
			(10.92)	(9.09)			(2.95)	(1.35)
*DERIV*SEAS*				0.087**				-0.046
				(2.43)				(-0.71)
*DERIV**(1-*SEAS*)				0.002				0.033***
				(0.38)				(2.88)
Observations	30,058	30,058	30,058	30,058	5,812	5,812	5,812	5,812
R-squared	0.17	0.17	0.18	0.18	0.19	0.19	0.19	0.19

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. *significant at 10 %; ** significant at 5 %; *** significant at 1 %.

Table 7: Choice of market

	(1)	(2)	(3)	(4)	(5)
SIZE	0.106***	0.124***	0.121***	0.125***	0.135***
	(14.54)	(9.60)	(10.83)	(9.61)	(10.49)
INVA	0.176	0.238	0.178	0.236	0.235
	(0.85)	(1.11)	(0.83)	(1.10)	(1.09)
YEARS	-0.005	-0.012**	0.003	-0.012**	-0.010**
	(-0.94)	(-2.37)	(0.50)	(-2.36)	(-1.97)
LEVER	-0.393***	-0.272***	-0.187*	-0.267***	-0.277***
	(-3.99)	(-2.68)	(-1.84)	(-2.62)	(-2.73)
PROF	-0.592***	-0.610***	-0.489**	-0.611***	-0.609***
	(-2.63)	(-2.65)	(-2.15)	(-2.65)	(-2.64)
LIQUID	-0.690***	-0.558***	-0.659***	-0.563***	-0.578***
	(-6.29)	(-4.84)	(-6.00)	(-4.91)	(-5.07)
COLL	0.706*	0.612	0.513	0.603	0.606
	(1.78)	(1.50)	(1.29)	(1.48)	(1.50)
DEBTSEC		-3.439***	-1.017	-3.713***	-2.855***
		(-4.47)	(-1.24)	(-4.36)	(-3.25)
ONSRATIO		-2.160***	-1.347***	-2.129***	-2.032***
		(-10.60)	(-7.18)	(-10.16)	(-9.60)
STOCKTVR		0.066**	0.158***	0.064**	0.060**
		(2.22)	(6.00)	(2.15)	(2.04)
SID		-0.056***		-0.056***	-0.052***
		(-7.28)		(-7.24)	(-6.86)
WITHTAX			-0.668***		
			(-10.77)		
CPIS				0.0001	-0.001*
				(0.73)	(-1.95)
DERIV					0.064***
					(5.56)
Observations	4,487	4,487	4,487	4,487	4,487
R-squared	0.08	0.11	0.11	0.11	0.12

Notes: The table reports the effects of the variables listed on the probability to issue in a foreign market by a probit model. The dependent variable is a dummy equal to one if the firm issues in a foreign market, and zero otherwise. All models include a time trend. Robust z-statistics in parentheses. All firm-specific variables are lagged one period. *significant at 10 %; ** significant at 5 %; *** significant at 1 %.

Table 8: A more detailed breakdown for the choice of market

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	non-fin	non-fin	non-fin	non-fin	fin	fin	fin	fin
*DEBTSEC*SEAS*	-5.160*	-1.079	-0.397	3.255	-0.760	4.524**	-0.472	0.575
	(-1.80)	(-0.34)	(-0.13)	(0.96)	(-0.19)	(2.41)	(-0.12)	(0.14)
*DEBTSEC**(1-*SEAS*)	-5.885***	-4.857***	-7.150***	-6.264***	-0.311	2.743	0.248	0.576
	(-6.40)	(-4.76)	(-7.23)	(-6.13)	(-0.15)	(1.02)	(0.11)	(0.25)
*ONSRATIO*SEAS*	-0.751	0.841	-0.713	-0.839	-0.230	0.419	0.030	0.727
	(-1.21)	(1.14)	(-1.13)	(-1.21)	(-0.19)	(0.12)	(0.02)	(0.50)
*ONSRATIO**(1-*SEAS*)	-2.751***	-2.281***	-2.686***	-2.423***	-2.274***	-1.111**	-2.349***	-2.370***
	(-10.37)	(-9.31)	(-9.84)	(-8.59)	(-4.87)	(-2.53)	(-4.79)	(-4.87)
*STOCKTVR*SEAS*	-0.035	-0.050	-0.048	-0.076	0.762*	1.407	0.650	0.677
	(-0.44)	(-0.59)	(-0.60)	(-0.96)	(1.77)	(1.51)	(1.43)	(1.51)
*STOCKTVR**(1-*SEAS*)	0.062	0.151***	0.061	0.040	-0.846***	-0.828***	-0.853***	-0.859***
	(1.58)	(4.17)	(1.56)	(1.04)	(-6.18)	(-5.10)	(-6.19)	(-6.23)
*SID*SEAS*	-0.045***		-0.049***	-0.033**	-0.142***		-0.146***	-0.098*
	(-2.99)		(-3.21)	(-2.12)	(-2.64)		(-2.60)	(-1.69)
*SID**(1-*SEAS*)	-0.051***		-0.049***	-0.045***	-0.069***		-0.069***	-0.068***
	(-5.22)		(-5.03)	(-4.65)	(-3.69)		(-3.72)	(-3.69)
*WITHTAX*SEAS*		-4.309***				-9.237***		
		(-4.87)				(-5.19)		
*WITHTAX**(1-*SEAS*)		-0.465***				-1.314***		
		(-5.96)				(-6.22)		
*CPIS*SEAS*			-0.005**	-0.013***			-0.004	-0.004
			(-2.16)	(-4.64)			(-1.36)	(-1.27)
*CPIS**(1-*SEAS*)			0.001**	-0.0002			-0.001	-0.002
			(2.18)	(-0.11)			(-0.82)	(-0.93)
*DERIV*SEAS*				2.472**				2.809
				(2.45)				(1.53)
*DERIV**(1-*SEAS*)				0.065***				0.019
				(4.85)				(0.51)
Observations	3,318	3,318	3,318	3,318	1,169	1,169	1,169	1,169
R-squared	0.24	0.25	0.24	0.25	0.54	0.61	0.54	0.54

Notes: The table reports the effects of the variables listed on the probability to issue in a foreign market by a probit model. The dependent variable is a dummy equal to one if the firm issues a bond in a foreign market, and zero otherwise. All models include a time trend. Robust z-statistics in parentheses. All firm-specific variables are lagged one period. *significant at 10 %; ** significant at 5 %; *** significant at 1 %.

Table 9: Debt structure

	(1) OLS	(2) OLS	(3) Tobit	(4) Tobit
$SIZE$	-0.002*	-0.002	0.018***	0.016***
	(-1.82)	(-1.57)	(3.06)	(2.97)
$INVA$	-0.001	-0.003	0.063	0.036
	(-0.28)	(-0.76)	(0.71)	(0.50)
$PROF$	-0.026	-0.028	-0.313**	-0.297**
	(-1.31)	(-1.39)	(-2.51)	(-2.49)
$LIQUID$	-0.001	-0.005	-0.004	-0.014
	(-0.11)	(-0.39)	(-0.07)	(-0.23)
$MTBOOK$	-0.000	-0.000**	-0.000	-0.002
	(-1.37)	(-2.31)	(-0.09)	(-0.48)
$COLL$	0.099	0.092	0.308*	0.282*
	(1.41)	(1.33)	(1.81)	(1.69)
$FCDUM$	0.002	0.002	0.018	0.031
	(0.39)	(0.52)	(0.69)	(1.27)
$DEBTSEC$	-0.267	-0.165	-1.816**	-1.928**
	(-1.04)	(-0.65)	(-2.53)	(-2.58)
$ONSRATIO$	0.030	0.095**	-0.033	0.318**
	(1.41)	(2.46)	(-0.27)	(2.15)
$STOCKTVR$	-0.005**	-0.003	-0.037**	-0.027*
	(-2.24)	(-1.30)	(-2.10)	(-1.68)
SID	-0.001*		-0.027***	
	(-1.83)		(-3.89)	
$CPIS$	0.0001*	0.0001**	0.001***	0.002***
	(1.76)	(2.09)	(5.22)	(7.04)
$DERIV$	0.003	0.001	0.003	-0.009
	(1.33)	(0.39)	(0.55)	(-1.30)
$WITHTAX$		-0.033**		-0.224***
		(-2.49)		(-4.68)
Observations	1,054	1,054	1,054	1,054
Left-censored obs			882	882
R-squared	0.067	0.074		

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. *significant at 10 %; ** significant at 5 %; *** significant at 1 %.

Table A-1: Full results for bond issuance decision

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	non-fin	non-fin	non-fin	non-fin	fin	fin	fin	fin
*SIZE*SEAS*	0.277***	0.273***	0.289***	0.299***	0.360***	0.360***	0.367***	0.367***
	(12.56)	(12.51)	(13.07)	(13.40)	(8.40)	(9.20)	(8.52)	(8.49)
*SIZE**(1-*SEAS*)	0.174***	0.140***	0.185***	0.186***	0.185***	0.157***	0.189***	0.191***
	(27.68)	(27.06)	(28.22)	(28.22)	(17.72)	(17.99)	(17.80)	(18.00)
*INVA*SEAS*	1.473**	1.511**	1.541**	1.496**	1.752	1.360	1.753	1.658
	(2.28)	(2.38)	(2.34)	(2.30)	(1.57)	(1.37)	(1.59)	(1.54)
*INVA**(1-*SEAS*)	0.335***	0.262**	0.355***	0.357***	0.459**	0.381*	0.459**	0.475**
	(3.11)	(2.46)	(3.27)	(3.28)	(2.30)	(1.94)	(2.30)	(2.38)
*YEARS*SEAS*	-0.009	-0.009	-0.007	-0.008	0.045	0.038	0.045	0.044
	(-0.77)	(-0.77)	(-0.59)	(-0.68)	(1.61)	(1.27)	(1.60)	(1.55)
*YEARS**(1-*SEAS*)	0.004*	0.009***	0.003	0.003	0.030***	0.033***	0.029***	0.029***
	(1.65)	(3.67)	(1.04)	(1.10)	(5.38)	(5.90)	(5.27)	(5.37)
*LEVER*SEAS*	1.675***	1.703***	1.692***	1.642***	3.563**	2.831**	3.612**	3.563**
	(5.00)	(5.09)	(4.99)	(4.90)	(2.34)	(1.99)	(2.44)	(2.44)
*LEVER**(1-*SEAS*)	0.744***	0.721***	0.772***	0.772***	0.888***	0.836***	0.920***	0.904***
	(16.01)	(15.60)	(16.30)	(16.29)	(10.11)	(9.63)	(10.27)	(10.11)
*PROF*SEAS*	1.149*	1.155*	1.179*	1.169*	2.154	2.117	2.053	1.974
	(1.88)	(1.87)	(1.92)	(1.95)	(1.22)	(1.22)	(1.12)	(1.09)
*PROF**(1-*SEAS*)	0.696***	0.784***	0.709***	0.709***	1.445***	1.468***	1.452***	1.445***
	(7.17)	(8.21)	(7.12)	(7.12)	(6.60)	(6.81)	(6.53)	(6.49)
*LIQUID*SEAS*	0.188	0.178	0.246	0.169	0.272	0.084	0.300	0.160
	(0.59)	(0.56)	(0.74)	(0.50)	(0.45)	(0.14)	(0.50)	(0.25)
*LIQUID**(1-*SEAS*)	-0.264***	-0.356***	-0.263***	-0.262***	0.018	-0.064	0.029	0.018
	(-4.82)	(-6.60)	(-4.76)	(-4.73)	(0.22)	(-0.79)	(0.34)	(0.21)
*COLL*SEAS*	1.759	1.654	1.955	1.863	28.840**	31.964**	26.005	29.971
	(0.96)	(0.90)	(1.02)	(1.00)	(1.97)	(2.01)	(1.58)	(1.54)
*COLL**(1-*SEAS*)	0.647***	0.670***	0.642***	0.648***	-0.837	-0.949*	-0.807	-0.682
	(3.83)	(4.05)	(3.80)	(3.82)	(-1.46)	(-1.68)	(-1.42)	(-1.21)
*DEBTSEC*SEAS*	2.047	2.373	2.574	3.117	-3.708	-4.879*	-3.796	-4.167
	(1.07)	(1.26)	(1.18)	(1.41)	(-1.43)	(-1.70)	(-1.46)	(-1.63)
*DEBTSEC**(1-*SEAS*)	4.758***	5.344***	3.622***	3.671***	4.048***	4.077***	3.468***	3.902***
	(17.00)	(16.93)	(11.97)	(11.51)	(7.55)	(7.20)	(6.14)	(6.63)
*ONSRATIO*SEAS*	-0.551	-0.670	-0.182	-0.227	-0.891	-1.104	-0.920	-0.834
	(-1.03)	(-1.26)	(-0.34)	(-0.43)	(-1.04)	(-1.37)	(-1.07)	(-0.98)
*ONSRATIO**(1-*SEAS*)	0.069	0.454***	0.355***	0.365***	1.210***	1.313***	1.306***	1.305***
	(0.78)	(5.30)	(3.72)	(3.85)	(8.00)	(8.50)	(8.48)	(8.46)
*STOCKTVR*SEAS*	-0.247***	-0.226***	-0.277***	-0.289***	-0.535***	-0.629***	-0.511***	-0.508***
	(-3.51)	(-3.18)	(-3.87)	(-4.00)	(-3.00)	(-3.75)	(-2.75)	(-2.72)
*STOCKTVR**(1-*SEAS*)	-0.008	0.061***	-0.019	-0.019	-0.064*	-0.003	-0.063	-0.063*
	(-0.52)	(4.29)	(-1.22)	(-1.24)	(-1.66)	(-0.08)	(-1.64)	(-1.66)
*SID*SEAS*	-0.007		-0.009	-0.008	-0.023		-0.026	-0.032
	(-0.43)		(-0.58)	(-0.50)	(-0.52)		(-0.59)	(-0.70)
*SID**(1-*SEAS*)	-0.039***		-0.039***	-0.039***	-0.022***		-0.021***	-0.018***
	(-9.68)		(-9.33)	(-9.16)	(-3.49)		(-3.34)	(-2.97)
*WITHTAX*SEAS*		0.017				0.432*		
		(0.09)				(1.65)		
*WITHTAX**(1-*SEAS*)		-0.079**				0.057		
		(-2.58)				(0.98)		
*CPIS*SEAS*			-0.000	-0.002			0.001	0.002
			(-0.18)	(-1.15)			(0.62)	(0.93)
*CPIS**(1-*SEAS*)			0.002***	0.002***			0.001***	0.001
			(10.92)	(9.09)			(2.95)	(1.35)
*DERIV*SEAS*				0.087**				-0.046
				(2.43)				(-0.71)
*DERIV**(1-*SEAS*)				0.002				0.033***
				(0.38)				(2.88)
Observations	30,058	30,058	30,058	30,058	5,812	5,812	5,812	5,812
R-squared	0.17	0.17	0.18	0.18	0.19	0.19	0.19	0.19

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. *significant at 10 %; ** significant at 5 %; *** significant at 1 %.

Table A-2: Test for the equality of coefficients based on results in Table A-1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	non-fin	non-fin	non-fin	non-fin	fin	fin	fin	fin
$SIZE$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
$INVA$	0.09	0.05	0.07	0.08	0.25	0.33	0.24	0.28
$LEVER$	0.00	0.00	0.00	0.01	0.07	0.16	0.06	0.07
$PROF$	0.52	0.55	0.44	0.44	0.68	0.71	0.74	0.77
$LIQUID$	0.19	0.09	0.12	0.20	0.67	0.80	0.65	0.82
$COLL$	0.58	0.59	0.49	0.51	0.04	0.03	0.09	0.11
$DEBTSEC$	0.09	0.10	0.63	0.80	0.00	0.00	0.00	0.00
$ONSRATIO$	0.18	0.03	0.31	0.26	0.01	0.00	0.01	0.01
$STOCKTVR$	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01
SID	0.04		0.07	0.07	0.97		0.90	0.76
$WITHTAX$		0.61				0.16		
$CPIS$			0.07	0.01			0.96	0.53
$DERIV$				0.02				0.23

Notes: The table reports p-values of a test statistic where the null hypothesis is the equality of the coefficients.

Table A-3: Full results for the choice of market

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	non-fin	non-fin	non-fin	non-fin	fin	fin	fin	fin
*SIZE*SEAS*	0.057**	0.140***	0.072***	0.111***	0.351***	4.496***	0.359***	0.301***
	(2.14)	(4.37)	(2.77)	(3.53)	(5.09)	(5.34)	(5.07)	(4.14)
*SIZE**(1-*SEAS*)	0.067***	0.044***	0.066***	0.082***	0.230***	0.226***	0.220***	0.224***
	(4.08)	(2.97)	(4.05)	(4.99)	(6.16)	(4.66)	(5.96)	(5.96)
*INVA*SEAS*	-0.496	-0.104	-0.267	-0.153	0.425	3.529***	0.321	0.011
	(-0.66)	(-0.14)	(-0.35)	(-0.18)	(0.31)	(3.54)	(0.22)	(0.01)
*INVA**(1-*SEAS*)	0.482*	0.273	0.490*	0.474*	-3.018***	-2.873***	-2.962***	-2.946***
	(1.70)	(0.97)	(1.72)	(1.66)	(-3.18)	(-3.12)	(-3.13)	(-3.09)
*YEARS*SEAS*	-0.013	0.024*	-0.018	-0.007	0.006	1.142***	0.004	0.015
	(-1.04)	(1.74)	(-1.37)	(-0.51)	(0.12)	(4.36)	(0.08)	(0.27)
*YEARS**(1-*SEAS*)	-0.024***	-0.016**	-0.024***	-0.022***	-0.001	0.016	-0.002	-0.000
	(-3.66)	(-2.41)	(-3.67)	(-3.33)	(-0.03)	(0.56)	(-0.09)	(-0.02)
*LEVER*SEAS*	0.870**	1.464***	0.820**	0.650	-5.490***	-1.306	-5.885***	-5.595***
	(2.24)	(3.53)	(2.05)	(1.55)	(-4.76)	(-0.82)	(-4.66)	(-4.48)
*LEVER**(1-*SEAS*)	-0.269*	-0.224	-0.245	-0.245	-0.257	-0.167	-0.289	-0.293
	(-1.80)	(-1.49)	(-1.64)	(-1.63)	(-0.82)	(-0.53)	(-0.91)	(-0.92)
*PROF*SEAS*	-1.705**	-1.236	-1.652**	-1.648*	-27.517***	-49.314***	-26.524***	-25.015***
	(-2.15)	(-1.64)	(-2.05)	(-1.85)	(-4.28)	(-3.17)	(-4.18)	(-3.87)
*PROF**(1-*SEAS*)	-0.645**	-0.572**	-0.640**	-0.649**	-0.051	0.448	-0.011	0.007
	(-2.37)	(-2.10)	(-2.33)	(-2.36)	(-0.05)	(0.47)	(-0.01)	(0.01)
*LIQUID*SEAS*	-1.412***	-0.953***	-1.283***	-1.506***	-4.801***	-10.701***	-5.113***	-5.129***
	(-4.29)	(-2.72)	(-3.71)	(-4.29)	(-3.57)	(-3.35)	(-3.43)	(-3.20)
*LIQUID**(1-*SEAS*)	-0.228	-0.378**	-0.250	-0.236	-0.132	-0.656**	-0.116	-0.120
	(-1.37)	(-2.29)	(-1.51)	(-1.41)	(-0.51)	(-2.43)	(-0.44)	(-0.45)
*COLL*SEAS*	4.019**	4.501**	4.530***	3.526**	0.753	-18.105***	10.510	6.470
	(2.51)	(2.47)	(2.67)	(2.06)	(0.04)	(-3.97)	(0.29)	(0.19)
*COLL**(1-*SEAS*)	-0.202	-0.330	-0.251	-0.216	-35.196***	-31.678**	-35.243***	-35.545***
	(-0.40)	(-0.65)	(-0.49)	(-0.42)	(-3.04)	(-2.38)	(-3.07)	(-3.07)
*DEBTSEC*SEAS*	-5.160*	-1.079	-0.397	3.255	-0.760	4.524**	-0.472	0.575
	(-1.80)	(-0.34)	(-0.13)	(0.96)	(-0.19)	(2.41)	(-0.12)	(0.14)
*DEBTSEC**(1-*SEAS*)	-5.885***	-4.857***	-7.150***	-6.264***	-0.311	2.743	0.248	0.576
	(-6.40)	(-4.76)	(-7.23)	(-6.13)	(-0.15)	(1.02)	(0.11)	(0.25)
*ONSRATIO*SEAS*	-0.751	0.841	-0.713	-0.839	-0.230	0.419	0.030	0.727
	(-1.21)	(1.14)	(-1.13)	(-1.21)	(-0.19)	(0.12)	(0.02)	(0.50)
*ONSRATIO**(1-*SEAS*)	-2.751***	-2.281***	-2.686***	-2.423***	-2.274***	-1.111**	-2.349***	-2.370***
	(-10.37)	(-9.31)	(-9.84)	(-8.59)	(-4.87)	(-2.53)	(-4.79)	(-4.87)
*STOCKTVR*SEAS*	-0.035	-0.050	-0.048	-0.076	0.762*	1.407	0.650	0.677
	(-0.44)	(-0.59)	(-0.60)	(-0.96)	(1.77)	(1.51)	(1.43)	(1.51)
*STOCKTVR**(1-*SEAS*)	0.062	0.151***	0.061	0.040	-0.846***	-0.828***	-0.853***	-0.859***
	(1.58)	(4.17)	(1.56)	(1.04)	(-6.18)	(-5.10)	(-6.19)	(-6.23)
*SID*SEAS*	-0.045***		-0.049***	-0.033**	-0.142***		-0.146***	-0.098*
	(-2.99)		(-3.21)	(-2.12)	(-2.64)		(-2.60)	(-1.69)
*SID**(1-*SEAS*)	-0.051***		-0.049***	-0.045***	-0.069***		-0.069***	-0.068***
	(-5.22)		(-5.03)	(-4.65)	(-3.69)		(-3.72)	(-3.69)
*WITHTAX*SEAS*		-4.309***				-9.237***		
		(-4.87)				(-5.19)		
*WITHTAX**(1-*SEAS*)		-0.465***				-1.314***		
		(-5.96)				(-6.22)		
*CPIS*SEAS*			-0.005**	-0.013***			-0.004	-0.004
			(-2.16)	(-4.64)			(-1.36)	(-1.27)
*CPIS**(1-*SEAS*)			0.001**	-0.0002			-0.001	-0.002
			(2.18)	(-0.11)			(-0.82)	(-0.93)
*DERIV*SEAS*				2.472**				2.809
				(2.45)				(1.53)
*DERIV**(1-*SEAS*)				0.065***				0.019
				(4.85)				(0.51)
Observations	3,318	3,318	3,318	3,318	1,169	1,169	1,169	1,169
R-squared	0.24	0.25	0.24	0.25	0.54	0.61	0.54	0.54

Notes: The table reports the effects of the variables listed on the probability to issue in a foreign market by a probit model. The dependent variable is a dummy equal to one if the firm issues a bond in a foreign market, and zero otherwise. All models include a time trend. Robust z-statistics in parentheses. All firm-specific variables are lagged one period. *significant at 10 %; ** significant at 5 %; *** significant at 1 %.

Table A-4: Test for the equality of coefficients based on results in Table A-3

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	non-fin	non-fin	non-fin	non-fin	fin	fin	fin	fin
$SIZE$	0.72	0.00	0.83	0.37	0.05	0.00	0.03	0.26
$INVA$	0.22	0.63	0.35	0.47	0.04	0.00	0.05	0.09
$LEVER$	0.00	0.00	0.01	0.04	0.00	0.48	0.00	0.00
$PROF$	0.20	0.40	0.23	0.28	0.00	0.00	0.00	0.00
$LIQUID$	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00
$COLL$	0.01	0.01	0.00	0.03	0.07	0.00	0.21	0.23
$DEBTSEC$	0.80	0.25	0.03	0.00	0.91	0.02	0.87	0.98
$ONSRATIO$	0.00	0.00	0.00	0.02	0.10	0.67	0.08	0.04
$STOCKTVR$	0.26	0.02	0.20	0.12	0.00	0.01	0.00	0.00
SID	0.74		0.98	0.52	0.18		0.17	0.61
$WITHTAX$		0.00				0.00		
$CPIS$			0.00	0.01			0.35	0.50
$DERIV$				0.01				0.12

Notes: The table reports p-values of a test statistic where the null hypothesis is the equality of the coefficients.