Equity Cross-Listings in the U.S. and the Price of Debt*

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Abstract

This study examines whether foreign firms raise debt capital more often and at lower rates after cross listing their equity shares in the U.S., and the sources of these debt market benefits. Employing a large global sample from more than 40 countries, we find that firms raise debt capital more frequently in the bond market and issue fewer syndicated loans following an equity cross-listing on a U.S. exchange. Offering yields of bonds are significantly lower after the cross-listing, while syndicated loan spreads do not change. We also find that cross-listed firms are more likely to conduct public bond offerings, at lower rates, instead of placing their bonds privately. Moreover, cross-listed firms domiciled in countries with a relatively weak regulatory and reporting environments issue bonds more frequently outside the U.S., while those located in countries that protect lenders well, issue more Yankee bonds, again at a lower cost. These results support the notion that bonding, information disclosure, and liquidity benefits from U.S. equity cross-listings extend to the debt holders of the firm.

JEL classification: F34, G12, G15, G38, K22

Key Words: *Corporate governance, Bonding hypothesis, Debt financing, Disclosure, Law and finance, International accounting*

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1. Introduction

Does cross listing equity shares in the United States facilitate non-U.S. firms' access to more debt financing and lower the cost of debt? Debt markets traditionally have been a greater source of external capital than equity markets (e.g., Rajan and Zingales, 1995; Henderson, Jegadeesh, and Weisbach, 2006). However, the extant literature almost exclusively focuses on the costs and benefits of cross listing equity to shareholders (Karolyi, 1998, 2006), arguing that firms domiciled in countries with weak protection of minority shareholders, poor information environments, limited availability of equity capital and segmented markets can overcome these shortfalls by subjecting themselves to U.S. securities regulation and oversight (Coffee, 1999; Stulz, 1999).[1] While effects in the equity market are important and ultimately serve to justify the cross-listing decision, there is only limited evidence on the debt market implications of equity cross-listings in the U.S. (e.g., Miller and Puthenpurackal, 2002; Lins, Strickland, and Zenner, 2005; Qi, Roth, and Wald, 2010).[2]

Much of the equity benefits of cross listing draw on the comparative advantages of both the U.S markets with their depth and liquidity as well as the U.S. judicial system with its more transparent disclosures, investor protection and effective monitoring. These characteristics, in principle, should also benefit the lenders of the firm as they likely facilitate access to secondary debt markets with higher liquidity and better information, and allow for more effective monitoring and enforcement of debt agreements. In return, lenders should be willing to provide more debt capital at lower levels of price protection, reducing the borrowing costs of the firm (Hart, 1995).

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[1] Consistent with this notion, prior evidence suggests that firms cross listing shares on a U.S. exchange raise equity capital more frequently (e.g., Reese and Weisbach, 2002), obtain higher equity valuations (e.g., Foerster and Karolyi, 1999; Doidge, Karolyi, and Stulz, 2004), reduce the cost of equity capital (e.g., Errunza and Miller, 2000; Hail and Leuz, 2009), improve liquidity (e.g., Baruch, Karolyi, and Lemmon, 2007), and expand their investor base (e.g., Ammer et al., 2008; King and Segal, 2009).

[2] We refer to a foreign firm's U.S. cross-listed equity as "ADR," regardless of whether it is an exchange-listed American Depositary Receipt (Level II or III), a direct listing (e.g., for Canadian firms), a globally or New York registered share, a share traded in the over-the-counter markets (the OTC Bulletin Board and Pink Sheets), or a private placement under Rule 144A.

However, the realization of these debt-related benefits after firms cross list their shares in the U.S. is far from certain. First, the effectiveness of debt enforcement and the level of creditor protection in the country of domicile are important factors that affect the availability and terms of debt capital. The physical location of firms' assets that could serve as collateral typically determines the legal procedures in case of default and the applicability of bankruptcy laws (La Porta et al. 1997; Qian and Strahan, 2007). Also, debt contracts issued outside of the U.S. do not fall under the jurisdiction of the U.S. legal system and might require higher yields. Second, growth opportunities associated with equity cross-listings increase lenders' agency costs because of controlling shareholders' tendency to opportunistically select investment projects that maximize shareholder value rather than total firm value. Even though the disclosure requirements from filings with the U.S. Securities and Exchange Commission (SEC) potentially mitigate these agency conflicts, they might not offset them completely. Third, potential debt-related benefits from equity cross listings are likely to vary across different types of debt (public vs. private) given lenders' differential access to information and ability to monitor the borrowers. In the case of public debt offerings, which are arm's length transactions, lenders likely rely more on country-level governance institutions for protection, enforcement and disclosure, both in the U.S. and the country of domicile, and hence should obtain higher benefits from the certification role of equity cross-listings. On the other hand, lenders in private debt offerings obtain privileged access to information, have the resources and incentives to more closely monitor the borrower, and have multiple levers at their disposal (not just interest rates) when setting or renegotiating contract terms (Gigler et al., 2009). This reduces their need for external certification via equity cross-listings. Thus, in light of these opposing forces, the debt market effects of equity cross-listings in the U.S. are ultimately an empirical question.

We examine the impact of equity cross-listings on a large international sample of bond, syndicated loan, and equity issues for more than 21,000 non-U.S. firms from 43 countries over the

years 1992 to 2005.[3] We begin with an analysis of firms' use of external capital markets, and find that non-U.S. firms are more likely to issue bonds and equity but enter into fewer syndicated loan agreements after an equity cross-listing on a U.S. exchange.[4] This shift from private loans to bond financing is consistent with an improvement in the firm's information and monitoring environment. Next, we limit the analysis to 2,738 bond and 2,785 syndicated loan issues with detailed contractual features data available, and find that bond offering yields are, on average, *lower* by about 50 basis points after an equity cross-listing on NYSE, Nasdaq, and Amex or an over-the-counter (OTC) trading of shares in the Pink Sheets or on the OTC Bulletin Board. This translates into yearly cost savings of about US$ 1 million per firm based on the average bond size of US$ 191 million. In contrast, we find no such reduction for offering spreads of syndicated loans. Our findings are robust to including a comprehensive set of bond and loan characteristics, firm attributes, macroeconomic factors, country, industry, and year fixed effects, and to tests controlling for the endogenous nature of the cross-listing decision.

Next, we explore factors that help explain why bond markets become more attractive after equity cross-listings. In doing so, we exploit the cross-sectional variation in the type of debt instrument issued, the location of the bond offering, and the institutional background of the issuing firm's country of domicile. First, we show that firms with equity cross-listings issue more public bonds instead of placing bonds privately, in particular if domiciled in countries with a code law legal tradition or relatively weaker auditing and reporting standards. Public bonds come with lower offering yields, while privately placed bonds do not. We also find that cross-listed firms located in

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[3] The bonds in our sample are fixed-rate debt instruments with the principal repaid at maturity. The loans are floating rate loans syndicated by a group of banks, and typically issued in a package of several facilities with various repayment schedules. We stop our sample in 2005 to avoid the mitigating effects of mandatory IFRS adoption, which has been shown to affect debt contracts and conditions (e.g., Chen et al., 2013; Florou and Kosi, 2013).

[4] The bond and equity results are in line with Reese and Weisbach (2002) and Lins, Strickland, and Zenner (2005) who provide (primarily univariate) evidence of this behavior.

code law countries, in countries with less efficient debt enforcement, or in countries with a relatively weak information environment (as measured by the strength of their auditing and reporting standards) are more likely to issue bonds domestically or in the Eurobond market. We find that these bonds issued outside the U.S. carry lower offering yields. The results are consistent with the bonding and information disclosure arguments which suggest that improvements in the legal and reporting environment due to the U.S. equity cross-listing should primarily benefit debt holders with limited information acquisition and monitoring capabilities (i.e., investors in public bonds), who are domiciled in countries with weak investor protection (e.g., code law countries).[5]

Second, we also find that after an equity cross-listing, firms issue more bonds in the U.S. at lower rates (Yankee bonds), in particular if they are domiciled in countries with relatively strong debt enforcement procedures. This result provides support for the liquidity and visibility argument (e.g., Foerster and Karolyi, 1999; Reese and Weisbach, 2002; Qi, Roth, and Wald, 2010), which stipulates that access to the large pool of U.S. private and institutional investors and the sheer size of the U.S. corporate bond market likely reduces the cost of debt financing, and that these benefits should be largest for firms from countries that protect lenders well.[6] This result is also consistent with the interpretation that having an equity cross listing significantly decreases the marginal costs of disclosures associated with the SEC registration of public debt issues.

Several prior studies are related to our work. Miller and Puthenpurackal (2002) focus on the benefits and wealth effects of equity cross-listings for the much smaller segment of public Yankee bonds. They find that non-U.S. firms with an equity listing on a U.S. exchange enjoy lower yield spreads. Reese and Weisbach (2002) examine the incidence of equity issues after cross-listing, and

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[5] Stulz (1999), Reese and Weisbach (2002), and Doidge, Karolyi, and Stulz (2004) provide these arguments with respect to the minority shareholders of the firm.

[6] The U.S. corporate bond market is by far the largest in the world. According to a report published by TheCityUK (2010), the U.S. corporate bond market comprises 39% of the global market as of the end of 2009. Japan, the second largest market, only covers 11%, followed by Spain (10.1%), and Italy (7.2%).

show that the increase in capital raising and the location of this activity differ systematically with the institutional background of the firm. However, they do not consider debt issuance in their analyses. Lins, Strickland, and Zenner (2005) test whether firms use ADRs to relax capital constraints and improve the overall cash flow sensitivity. They also provide univariate evidence that the number of debt and equity issues increases after an ADR listing, in particular for emerging market firms. Khurana, Martin, and Pereira (2008) investigate whether cross-listed firms' improved access to external funds contributes to higher growth prospects. They document a higher incidence of debt issues, but do not distinguish between the type of debt, the domicile of the issuer (or issuance), and do not control for any debt characteristics. Qi, Roth, and Wald (2010) show that stronger political rights in firms' countries of domicile are associated with lower yield spreads for a global sample of corporate bonds. In additional tests, they find that Yankee bonds (but not Eurobonds) trade at a premium after a U.S. equity cross-listing. Atilgan, Davis-Friday, and Ghosh (2007) show that Yankee bonds have lower offering yields relative to comparable bonds of U.S. firms, primarily due to better rating levels. Finally, Chaplinsky, and Ramchand (2004) document a significant increase in debt issuance activity by foreign firms after the approval of Rule 144A by the SEC in 1990, and attribute it to the greater liquidity of the U.S. capital market.

Our study contributes to this stream of literature along several dimensions. First, our main focus is the effect of a U.S. equity cross-listing on firms' debt issuing behavior. Hence, we examine not only the cost but also the incidence, location, and type of debt capital raised. Even though the primary means to cross list is via equity shares, debt financing remains the main source of external funding for many firms. Evidence that equity cross-listings impact the level of debt financing, the location of debt capital raising, and the costs of bond financing is important and adds to the extensive literature on the equity market benefits of cross-listing and to the literature on the determinants of corporate bond financing internationally (e.g., De Jong, Kabir, and Nguyen, 2008;

Fan, Titman, and Twite, 2012). Second, we investigate a comprehensive sample of public bonds, privately placed bonds, and syndicated loans. This allows us to study the impact of market structures and debt holders' monitoring capabilities across various sources of external debt capital. Our finding that cross-listed firms shift from private to public debt financing and that only the latter benefits from lower offering yields suggests that the superior monitoring and reporting mechanisms of the U.S. legal system play a lesser role in contracts that allow for private monitoring and communications. This adds to the literature on the interaction of country-level and firm-level corporate governance mechanisms (e.g., Klapper and Love, 2004; Doidge, Karolyi, and Stulz, 2007). Third, our sample comprising Eurobonds, domestic bonds, and Yankee bonds allows us to shed light on the underlying institutional forces driving the debt benefits. This contributes to the literature on the bonding, information, and liquidity hypotheses by showing that U.S. equity cross-listings to some extent offset the impact of weak home country institutions, but only when raising debt capital outside the U.S., and not when issuing Yankee bonds. While the importance of debt enforcement in firms' countries of domicile has been shown in other settings, the effect of a credible commitment to more transparent reporting, greater scrutiny by market forces, or increased visibility conveyed by U.S. equity cross-listings on firms' debt financing should be of interest to regulators and policy makers.

Section 2 contains the hypothesis development. In Section 3, we analyze changes to the propensity of issuing debt or equity capital following a U.S. equity cross-listing. Section 4 presents the effects of equity cross-listings on the yield-to-maturity for corporate bonds and syndicated loans. In Section 5 we conduct cross-sectional tests in which we distinguish between different types of bonds, the location of the bond offering, and the institutional characteristics of the issuing firm's country of domicile. Section 6 concludes the study.

2. Hypothesis Development

The main theories underlying the equity cross-listing decision are the bonding and information disclosure hypothesis (Stulz, 1999; Coffee, 1999, 2002) and the liquidity and visibility hypothesis (Stulz, 1981; Merton, 1987).[7] The bonding and information hypothesis suggests that companies choose to cross-list their equity in the U.S. to credibly signal their commitment to protect minority interests and to provide higher quality disclosures. It builds on the comparative advantages of the U.S. judicial and regulatory system with its superior disclosure regime and greater scrutiny from regulators, market intermediaries and investors. The liquidity and visibility hypothesis argues that firms cross list to access the more liquid and efficient U.S. capital markets and to increase their visibility among U.S. investors who manage large pools of capital.

The bonding and information hypothesis formulated for U.S. equity issuances should also apply to the case of debt issues. First, stringent disclosure and listing requirements for foreign registrants, such as the Form 20-F filing provisions, decrease debt holders' information acquisition and monitoring costs by lowering information asymmetries ex ante and allowing them to detect and resolve credit problems more timely ex post. Debt holders also gain access to information about prior debt contracts since the SEC requires that listed firms issuing public bonds and syndicated loans file the significant contents of these contracts. These benefits are particularly pronounced in arm's length transactions such as public bond issuances because of potential free-rider problems.[8] Sengupta (1998) and Francis, Nanda, and Olsson (2008) document that higher quality disclosures decrease the cost of debt for U.S. based firms. Shivakumar et al. (2011) document decreases in

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[7] Empirical work in the equity market provides support for these theories (e.g., Doidge, Karolyi, and Stulz, 2004; King and Segal, 2009).

[8] An arm's length transaction puts all investors on an equal footing, i.e., they have access to the same set of information. Because public bond ownership is typically fragmented and changes often in the secondary market and because individual bond investors do not have a significant informational advantage, they rely on other bond investors to pursue monitoring and information acquisition tasks. Thus, in equilibrium, no bond investor has incentives to monitor the bond contract generating the free-rider problem.

credit spreads when firms provide voluntary disclosures in the form of management forecasts.

Second, equity cross-listings decrease the disclosure costs associated with debt issues in the U.S. Such debt issues further allow debt holders to pursue legal actions against borrowers through the mechanisms of the U.S. judicial system, not available to them or available only at a higher cost in the firm's country of domicile (e.g., class action lawsuits). Hence, debt holders can benefit from the efficiency of U.S. debt enforcement procedures (e.g., Djankov et al., 2008). Third, U.S. regulatory bodies (e.g., the SEC, various market operators such as exchanges) as well as market intermediaries with reputational capital at stake such as auditors, underwriters, rating agencies, financial analysts, or the media limit the ability of controlling shareholders to expropriate resources from outside investors. Higher market scrutiny, in turn, may help deter strategic defaults, lower expected default rates, and reduce the costs of debt contracting.

Overall, a credible commitment to superior information and more market scrutiny in the U.S. should facilitate access to debt markets and reduce lenders' price protection (Hart, 1995). In line with Reese and Weisbach (2002), we expect the bonding and information disclosure benefits to be particularly pronounced when firms raise debt capital outside the U.S., especially if their home country is characterized by weak creditor protection and low disclosure quality.

Similarly, the liquidity and visibility hypothesis should also extend to debt issues. Compared to international markets, the liquidity of the U.S. market for corporate debt is significantly higher, mainly due to the existence of large and competitive underwriters, sophisticated debt market investors, multiple information intermediaries that lower information asymmetries between transacting parties, and low transaction costs. Higher levels of liquidity, in turn, lower the cost of debt (e.g., Chen, Lesmond, and Wei, 2007). In addition, having shares traded in the U.S. should help foreign borrowers overcome U.S. investors' lack of familiarity and facilitate access to a larger set of U.S. individual and institutional investors (Merton, 1987). Thus, under the liquidity and

visibility hypothesis, we expect cross-listed firms to raise more debt capital at lower rates in the U.S.[9] The benefits of issuing so-called Yankee bonds should particularly apply to cross-listed firms from countries with strong institutional backgrounds (Reese and Weisbach, 2002).

However, the ability to raise more and cheaper debt capital after equity cross-listings in the U.S. is far from certain. First, U.S. regulations and creditor protection rules do not explicitly apply to bonds not registered with the SEC (i.e., Eurobonds, domestic bonds, or private placements).[10] In those cases, the quality of debt enforcement and the creditor protection in the issuing firm's country of domicile likely affects the availability, structure and terms of debt contracts (La Porta et al., 1997; Qian and Strahan, 2007). This effect even holds for Yankee bonds which foreign firms issue in the U.S. and register with the SEC,[11] but likely is magnified for debt issued outside the U.S. Also, the physical location of the assets used as collateral in debt contracts typically determines the applicability of bankruptcy laws. Hence, bondholders might demand higher risk premiums from firms located in countries that do not protect their rights, simply because they expect that, if default occurs, the protection provided by the U.S. regulatory system via the equity cross-listing does not fully apply to them (e.g., Licht, 2003; Siegel, 2005).

Second, cross-listings can significantly exacerbate the agency costs of debt, which result from the conflicts of interest between shareholders and debt holders (e.g., Jensen and Meckling, 1976; Myers, 1977). Since cross-listings are typically associated with improvements in firms' growth opportunities (Doidge, Karolyi, and Stulz, 2004; Hail and Leuz, 2009), firms might exploit these additional growth options by making investments that maximize shareholders' wealth rather than

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9 It is important to note that liquidity improvements in the debt market are closely related to changes in the quality of the information environment. Hence, it is difficult, if not impossible, to completely disentangle the liquidity hypothesis from the bonding and information disclosure hypothesis.

10 Eurobonds are bonds issued by non-US corporations outside the U.S. in a currency other than the currency of the country in which they are issued.

11 Miller and Puthenpurackal (2002) and Miller and Reisel (2012) show that Yankee bond investors require higher yield spreads and impose more restrictive debt covenants on issuers located in countries with weak creditor rights protection. Atilgan, Davis-Friday, and Ghosh (2007) confirm the importance of home country institutions when comparing a sample of foreign firms that issue debt in the U.S. to a sample of U.S. issuers.

total firm value. More specifically, given the larger investment opportunity set combined with the extra equity capital raised following the cross-listing (Reese and Weisbach, 2002; Lins, Strickland, and Zenner, 2005), firms might avoid safe positive net present value projects in favor of risky, but negative net present value projects such as takeovers.[12] Consequently, these higher expected agency costs of debt might be associated with higher debt yields to compensate lenders for shareholders' opportunistic behavior.

Finally, the type of debt contract likely affects the debt related benefits from equity cross-listings given lenders' differential ability to access information and monitor the borrower. Public debt holders exercise limited control over the decisions of borrowers and do not take on an active monitoring role. They mainly rely on publicly available information, and, due to the free-rider problem, rarely renegotiate the contract if credit problems arise (e.g., Diamond, 1984, 1991). Hence, when specifying the contract terms in such an arm's length transaction, lenders likely rely more on country-level corporate governance institutions (e.g., Doidge, Karolyi, and Stulz, 2007). On the other hand, bank lenders have the resources and incentives to engage in active monitoring and to collect private information about the borrower thus lowering information asymmetries and moral hazard problems.[13] Because banks are more effective monitors, the difference between home country institutions and the U.S. regulatory system is less likely to affect the cost of private debt relative to the cost of public debt.[14] Banks also are in a better position to deal with higher agency

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[12] Firm leverage generally increases after takeovers (Kim and McConnell, 1977; Ghosh and Jain, 2000). This reduces the value of the outstanding debt by increasing the probability and the deadweight costs of a possible future bankruptcy and by reordering the priority of claims in case of default (e.g., issuance of more senior debt). Furthermore, defensive actions by incumbent managers of target firms might induce economic losses for current bondholders even before a takeover occurs (e.g., recapitalizations, increased payouts to shareholders).

[13] Banks have bargaining power over the firm's profits due to extensive monitoring (Rajan, 1992). Berger and Udell (1995) and Petersen and Rajan (1994) show that small U.S. firms with close banking ties have easier access to credit at lower costs due to the fact that bank monitoring decreases agency costs. Bank lenders are usually able to exploit their privileged position with the borrowers, especially if their clients lack reputation, and can recoup monitoring costs from borrowers via financing terms (Fama, 1985).

[14] The institutional environment still plays a role for private debt. Esty and Megginson (2003), Qian and Strahan (2007), and Bae and Goyal (2009) show that cross-border differences in creditor rights and legal enforcement

costs after equity cross-listings. Often, they are directly involved with the borrowing company (i.e., relationship lending, investment banking services), and have extensive protection features attached to the lending agreement (e.g., covenants, performance pricing, seniority, collateral requirements). Thus, in the case of syndicated bank loans, lower interest rates are just one of many different ways to efficiently structure debt agreements (Gigler et al., 2009).[15]

3. Propensity of Debt and Equity Financing Analyses

3.1. Research Design

To empirically test the debt-related benefits of U.S. equity cross-listings we first examine changes in the propensity of issuing corporate bonds, syndicated loans and raising equity capital. We specify the following probit model, which estimates the propensity of raising new capital after U.S. equity cross-listings:

$$\text{External financing}_{i,t} = \beta_0 + \beta_{1a}\text{PP}_{i,t} + \beta_{1b}\text{OTC}_{i,t} + \beta_{1c}\text{EXCH}_{i,t} + \beta_2\text{Cross-listing firm}_i + \sum\beta_j\text{Firm-specific controls}_{i,t} + \sum\beta_k\text{Country, industry and year fixed effects}_{i,t} + \varepsilon_{i,t}. \quad (1)$$

We capture firms' external financing activity, our dependent variable, by tracking the following capital raising transactions over time: (1) offerings of corporate bonds, either publicly or via private placement (*Bond Issue*), (2) syndicated loan offerings (*Loan Issue*), and (3) offerings of common stock (*Equity Issue*). We use this information to create three binary indicator variables that take on the value of '1' if a firm issues either bonds, loans or equity in a given year and '0' otherwise.

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affect risk-sharing arrangements by banks and other important loan characteristics such as spreads, size, and maturity.

[15] Consistent with bank lenders being better able to mitigate agency issues than public debt holders, Harvey, Lins, and Roper (2004) find that equity returns around the issuance of syndicated loans (but not public bonds) are positively associated with management's separation of ownership and control and with the extent of assets in place that can be exploited by the management.

Our primary test variable is a non-U.S. firm's cross-listing status. We differentiate between (1) exchange listings on NYSE, Nasdaq, and Amex (*EXCH*), (2) over-the-counter listings in the Pink Sheets or the OTC Bulletin Board (*OTC*), and (3) private placements under Rule 144A (*PP*). This distinction reflects different regulatory consequences. Foreign firms with a U.S. exchange listing have to file Form 20-F with the SEC, requiring extensive disclosures and, during our sample period, a reconciliation of foreign financial statements to U.S. GAAP.[16] Moreover, by virtue of filing with the SEC, firms are subject to SEC enforcement and could face legal liabilities from shareholder litigation. OTC listings do not require a 20-F filing, but require a registration statement using Form F-6 and home-country disclosures. They are also subject to Rule 10b-5 and the Foreign Corrupt Practices Act, under which SEC enforcement actions and private securities litigation can be brought. Private placements do not require registration with the SEC or any additional disclosures. We use this information to construct three separate binary indicator variables that take on the value of '1' in years in which the respective cross-listing type exists and '0' otherwise.

We recognize that cross listing represents a voluntary choice on the part of the firm. To address this potential self-selection issue, we construct a *Cross-listing Firm* indicator variable set equal to '1' if the firm has ADRs outstanding during the sample period. The purpose of this variable is to control for time-invariant firm characteristics that are associated with the cross listing decision. Thus, this variable potentially reflects significant differences between firms that choose to cross list and firms that do not.[17] Including this variable in the regression model, in the spirit of a difference-in-differences analysis, also allows us to identify the cross-listing effect by comparing the post-

[16] We include Canadian firms in this group because they can directly list their shares on U.S. exchanges without using depository receipts and, at the same time, are exempted from certain U.S. reporting requirements under the Multi-Jurisdictional Disclosure System.

[17] When we replace the aggregate *Cross-listing Firm* indicator by three distinct firm indicators for each ADR type, the results remain largely unchanged.

cross-listing observations to the pre-cross-listing observations of the same firms as well as to observations from firms that never cross list in the U.S.

We further control for a series of firm characteristics that are likely associated with external funding needs. First, we include separate *Bond-*, *Loan-*, and *Equity-issuing Firm* indicator variables set equal to '1' if the firm engages in the respective external financing transactions over the sample period. This allows us to control for the presence of alternative sources of external funding. For instance, when examining the propensity of bond issuance, we control for the use of the syndicated loan market and the equity capital market, and vice versa. Next, we include several firm attributes. Firm size, measured as *Total Assets* in US$ million, is a proxy for information asymmetry between firms and investors. Larger firms should obtain more favorable financing terms given their reputation and tangible asset base. *Leverage*, measured as the ratio of long-term debt divided by total assets, captures the current capital structure and is related to the probability of future default. *Tangibility* stands for the quality of assets available as collateral, and equals firms' book value of property, plant and equipment scaled by total assets. *Return on Assets* is the ratio of operating income divided by average total assets. It reflects current performance and future growth prospects. *Negative Earnings* takes on the value of 1 if the firm reports operating losses in a given year, and 0 otherwise. Loss firms are expected to face more scrutiny from investors. We define *Funding Needs* as net cash flows from operations divided by total assets. We multiply this variable by -1 so that higher values stand for greater funding needs (i.e., more external financing). *Market-to-Book* is the ratio of market value of equity to book value of equity. Firms with valuable growth options (i.e., high market-to-book ratios) need more financing, but might also be more risky. *Return Variability* is a proxy for the firm's riskiness, and is computed as the annual standard deviation of monthly stock returns. Finally, we include country, one-digit SIC industry and year fixed effects.

3.2. Data and Sample Description

We start the sample construction by compiling detailed panel data on firms' debt and equity financing behavior as well as their cross-listing status in the U.S. We gather data on corporate bond offerings from Thompson Deals (part of Thompson One Banker), and the Mergent Fixed Income Securities Database (FISD). We only use the latter if the same bond, identified via issuing firm and bond characteristics such as the coupon rate or face value, is not already included in Thompson Deals. To ensure consistency with the yield-to-maturity analyses, we limit the bond sample to fixed-rate, non-convertible debt offerings. We collect the loan data from Dealscan and the information on equity offerings from the SDC Platinum database. We use this data to create the three binary indicators marking the existence and type of an external financing transaction in a given year.

We collect firms' cross-listing status from a comprehensive data set of active and inactive U.S. equity cross-listings using information from Citibank, JP Morgan, Bank of New York, Datastream and Bloomberg (see Hail and Leuz, 2009). This allows us to identify the point in time when a foreign firm first entered the U.S. market and when it changed the cross-listing status (e.g., from *OTC* to *EXCH*). We use this information to construct the three binary indicators for the existence and type of a U.S. equity cross-listing in a given year. For some specifications we aggregate the *OTC* and *EXCH* variables into a single *XLIST* variable.

Next, we manually match the external financing and the cross-listing panel data sets to the Worldscope universe (exclusive of the United States).[18] Due to the nature of the business and the existence of industry specific regulations, we exclude financial firms from the analyses (i.e., one-digit SIC code equal to 6). We further require at least one ADR observation per country and only

[18] If ticker information or data like the International Securities Identification Number (ISIN) is not available, we base the matching on the issuing firm's name, country of domicile and 4-digit SIC code. Note that this procedure does not allow us to identify debt and equity offerings by subsidiaries of the firm if these subsidiaries are incorporated under a different name, domiciled in a different country or belong to a different industry than their parent company. However, we would loose those observations anyway because of missing control variables and because we do not know whether the parent company provides an implicit guarantee for the subsidiaries.

retain firm-year observations with data for all the control variables available. Table 1 provides an overview of the resulting propensity of debt or equity financing sample together with the venues of external capital raising and types of U.S. cross-listing by country (Panel A) and year (Panel B). The sample comprises a maximum of 111,870 firm-years from 43 countries over the 1992 to 2005 period. 9,580 observations or about 9 percent represent years after firms cross-listed their shares in the U.S. The proportions of firm-years with bond, syndicated loan, or equity offerings amount to 3, 6, and 9 percent, respectively. Except for maybe Japanese firms, which comprise 18 percent of the sample (5 percent of the cross-listed firms and 21 percent of the years with external financing), no single country plays a dominant role in terms of external financing or U.S. cross-listing, and no unusual pattern in the time-series is apparent.[19] In Panel C of Table 1 we present descriptive statistics for the variables used in the propensity of debt or equity financing regressions and, in the table caption, provide further details on the variable measurement.

3.3. Results

We start with univariate comparisons of firms' external financing behavior between the pre- and post-cross-listing periods, and report results in Panel A of Table 2. In the first set of results, presented in the upper left-hand corner of the panel, we compare the 7,579 years with an active *EXCH* or *OTC* listing to the rest of the sample. The incidence of issuing corporate bonds is significantly higher for cross-listed firms (10.3 percent compared to only 2.6 percent for the rest of the population). This disparity holds regardless of the location of the bond offering (at home, in the U.S., or in the form of Eurobonds) as well as for public bond offerings and private bond placements. Similarly, the proportion of firms issuing syndicated loans or equity (and the number of such issues per firm) is higher among cross-listed firms. We then refine the tests by focusing only on the debt

[19] The bias towards Japanese firms is already present in Thompson Deals and Mergent FISD, consistent with prior evidence suggesting that Japanese firms moved away from bank debt towards public debt financing in the 1990s (Hoshi et al., 1993).

and equity financing transactions of cross-listed firms in the two years immediately before and after the cross-listing, separately for *PP*, *OTC*, and *EXCH*. We find that for *EXCH* firms the proportion of bond offerings is significantly higher, but not for the other cross-listing types. The same firms also take on more syndicated loans and issue equity capital more frequently. These findings are consistent with Reese and Weisbach (2002) or Lins, Strickland, and Zenner (2005), and suggest that the extent of external financing is associated with the regulatory and disclosure consequences of having equity traded on a U.S. exchange.

In Panel B of Table 2 we report coefficient estimates together with z-statistics (in parentheses) from estimating Eq. (1) across the three external capital raising choices: bond, loan, or equity issuance. We assess the statistical significance based on standard errors that are clustered by firm in all tests. We first use *Bond Issue* as the dependent variable. Models 1 and 2 vary depending on whether we include the entire sample or only the firms that at some point during the sample period cross-list their shares in the U.S. In Model 3 we limit the analysis to debt-issuing firms (i.e., firms with either a bond offering or syndicated loan issuance over the sample period), which allows us to examine the substitution effects of switching from one form of debt financing to another. In Model 4, we reduce the sample even further and only include firm-years with actual bond or loan transactions. The dependent variable in this model is set to zero in years in which firms tapped into the syndicated loan market, while a value of one stands for bond offerings. Across all four specifications, the coefficient on *EXCH* is positive and significant, indicating an increase in the occurrence of corporate bond offerings following a U.S. exchange listing.[20] Furthermore, Models 3 and 4 suggest that these firms substitute private debt with (public) bonds, which is indicative of an improved information environment and lower information asymmetry. *PP* is positive and significant in three out of four models. Since there are no regulatory or disclosure consequences

[20] The magnitude of the coefficient estimates suggests that an exchange listing in the U.S. increases the probability of bond issuance between one (Model 1) and 11 percent (Model 4).

associated with private equity placements under Rule 144A, this finding suggests that other factors such as an expansion in growth opportunities also might affect firms' financing behavior around equity cross-listings (e.g., Hail and Leuz, 2009). Except for one case the coefficient on *OTC* is insignificant.

Using *Loan Issue* as the dependent variable provides further evidence of the substitution effect. Both the coefficients on *OTC* and *EXCH* are significantly negative, consistent with a reduced likelihood of syndicated loan offerings after a cross-listing. The results regarding equity issues are mixed. While *OTC* firms exhibit a lower propensity to raise equity capital, there is evidence of an increase in equity issues for *EXCH* firms.

A look at the control variables across all models in Panel B shows that the various avenues of external capital raising complement each other. Firms that issue bonds are more likely to issue equity capital or take on syndicated loans, and vice versa. Moreover, firms that cross-list their shares in the U.S. at some point generally raise more equity capital or take on loans more frequently, but if anything, engage in fewer bond offerings before the cross-listing. Consistent with Houston and James (1996) or Cantillo and Wright (2000), we find that larger firms with higher leverage rely more on debt than equity financing. Greater funding needs and better growth prospects captured by the market-to-book ratio are positively related to external debt and equity financing. We also find that firms with higher stock return volatility are less likely to issue bonds, but rather raise syndicated loans or equity capital.

Overall, our evidence indicates that non-U.S. firms tend to issue more corporate bonds after an equity listing on a U.S. exchange, and substitute private syndicated debt for (public) bonds. This shift among debt instruments suggests a decrease in information asymmetry between the firm and its lenders, consistent with the arguments of Leland and Pyle (1977), Diamond (1984), or Fama

(1985). Hence, the propensity results suggest that U.S. equity cross-listings clearly represent an important factor affecting firms' capital structure.

4. Bond Yield-to-Maturity Analyses

4.1. Research Design

Moving beyond the propensity analyses, we next examine whether cross listing shares in the U.S. is associated with lower costs of issuing corporate bonds (or, in additional tests, syndicated loans). We specify the following ordinary least squares (OLS) regression model, which estimates changes to the bond offering yield-to-maturity following U.S. equity cross-listings:

$$\begin{aligned}\text{Bond yield-to-maturity}_{i,t} = {} & \gamma_0 + \gamma_{1a}\text{PP}_{i,t} + \gamma_{1b}\text{OTC}_{i,t} + \gamma_{1c}\text{EXCH}_{i,t} + \gamma_2\text{Cross-listing firm}_i \\ & + \sum\gamma_j\text{Bond-specific controls}_{i,t} + \sum\gamma_k\text{Firm-specific and macroeconomic controls}_{i,t} + \\ & \sum\gamma_l\text{Country, industry and year fixed effects}_{i,t} + \sigma_{i,t}. \end{aligned} \quad (2)$$

We measure the dependent variable as the offering yield (in percent) of the bond at the time of the issuance (*Bond Yield-to-Maturity*). Because the yield-to-maturity is likely affected by the expected level of real interest rates in the country of domicile and investors' time preferences for money over the life of the bond, we include the contemporaneous yields on U.S. Treasury securities (*U.S. T-Bill Rate*) and on local government securities (*Local T-Bill Rate*) with similar maturities and coupon rates as control variables in the model.[21] We again use the three cross-listing types, *PP*, *OTC*, and *EXCH*, as our test variables and include the *Cross-listing Firm* indicator to account for potential self-selection bias.[22] Hence, the cross-listing effects are computed relative to bond-years

[21] We prefer including the risk-free rates as control variables instead of subtracting them from the dependent variables which effectively forces a coefficient of one. This allows us to include multiple risk-free rates, accounting for the fact that some bonds are issued in a currency other than that of the issuing firms' country of domicile, and mitigates measurement error from imperfect matching. See also Section 4.4 for sensitivity analyses regarding this design choice.

[22] Our ADR coding, in principle, accounts for the sequence of U.S. cross-listings for a given firm. However, because of the imbalanced structure of the bond panel, we only include cross-listed firms that exhibit no change in ADR type in the data. Similarly, because we only have 29 ADR firms with data in the pre- and post-cross-listing period,

prior to the cross listing and to bond-years from firms that do not cross list.

We further control for a series of bond characteristics, which are likely associated with the offering yield. *Bond Maturity* measures the number of months from the date of issuance until maturity. Longer maturities increase the risk and should require higher yields. *Bond Size* equals the principal amount at issuance in US$ million. Larger bonds increase the risks of default, yet are more actively traded thereby lowering the liquidity premium. To capture a bond's default risk, we create a binary indicator variable (*Investment Grade*) equal to '1' if the bond's credit rating is BBB- or higher (Standard & Poor's) or Baa3 or higher (Moody's).[23] Riskier firms should pay higher yields. *Callable* and *Subordinated* are two indicators set equal to '1' if the issuer retains the privilege of redeeming the bond before maturity, and the bond ranks after other debt instruments in case of liquidation. In an attempt to measure firms' reputation in the bond market, we define a binary *Previous Bond Issues* variable marking whether the firm has issued other bonds over the last two years. Reputable firms have already shared information with market participants and, hence, should face lower information asymmetries.

In addition to the firm attributes used in the propensity analysis and described in Section 3.1 (*Total Assets*, *Market-to-Book*, *Leverage*, *Tangibility*, and *Return on Assets*), we include a set of macroeconomic control variables that likely affects the price of debt. High *Inflation*, measured as the median monthly percentage change in the consumer price index in a country and year, typically translates into higher interest rates on government securities and, as a result, higher rates for corporate debt. We also control for countries' financial development by including the logarithm of

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we cannot sensibly estimate a firm-fixed effects specification. In unreported analyses we confirm that allowing for changes in ADR type does not unduly affect the inferences from our tests.

[23] If issue-specific credit ratings are missing (i.e., for about 75% of the sample), we compute Altman's (1968) Z-score as (1.2*working capital + 1.4*retained earnings + 3.3*EBIT + 0.999*sales)/total assets + (0.6*market value of equity/book value of total liabilities). We then assign investment grade status based on a cutoff value of 2.675 as defined by Altman. We find a positive and significant correlation between Altman's Z-score and actual bond ratings for the subsample of bonds with both measures available.

the annual gross domestic product *GDP*. *Country Creditworthiness* reflects a country's overall credit rating, and captures the fact that bond yields are benchmarked to the default risk of local sovereign debt. Since most international bonds are denominated in currencies other than US$, we include *Exchange Rate Volatility*, measured as the coefficient of variation of daily US$ to local currency exchange rates in a given year. Bond yields are expected to reflect currency volatilities. Finally, we include country, one-digit SIC industry, and year fixed effects.

Aside from bond yield-to-maturities we also examine the effect of U.S. equity cross-listings on the cost of issuing syndicated loans. In those tests we use the *Loan Spread*, equal to the amount the borrower pays (including annual fees) over LIBOR or an equivalent rate for each dollar drawn down, as the dependent variable. Moreover, we replace the bond-specific controls in Eq. (2) with an equivalent set of loan-specific variables (see the notes to Table 4 for variable descriptions).

4.2. Data and Sample Description

We base the bond yield-to-maturity sample on the comprehensive panel collected for the propensity of debt and equity financing analyses (see Section 3.2). Due to the nature of the tests, we can only retain firm-years with actual bond issues for which data on the bond attributes are available in Thompson Deals or Mergent FISD. These sources provide data on issue size and type, issue date, bond features, ratings, and coupon rates. We note, however, that for many data items the availability is much sparser for international bonds than for U.S. bonds. We exclude bonds with floating rate coupons and bonds that are convertible since the pricing of these securities is quite different from fixed-rate instruments. If there are multiple offerings per firm and year, we only keep the largest bond. We also require a minimum issue size of US$ 10 million, and limit the sample to observations from countries with at least one bond issued by an ADR firm.

Panel A of Table 3 provides a country breakdown of the bond sample by the type of U.S. equity cross-listing and the mean yield-to-maturity rates across ADR and non-ADR firms. The sample comprises a maximum of 2,738 bond offerings from 32 countries over the years 1992 to 2005. A total of 560 observations or about 20 percent represent firm-years with U.S. equity cross-listings. Japanese firms make up more than half of the bond yield-to-maturity sample, which is why we asses the role of Japan on the results in the sensitivity analyses (see Section 4.4). In 18 out of the 32 countries ADR firms, on average, have lower yields-to-maturity than issues of non-ADR firms. However, due to the large fraction of Japanese firms, this does not hold for the sample as a whole. In Panel B we present descriptive statistics for the variables used to estimate Eq. (2). The mean bond issue carries a face value of US$ 191 million, has an offering yield of 4.06 percent, and matures in 6.6 years. 41 percent of the bond issues are investment grade, and more than half are from firms which repeatedly tap into the bond market. In the notes to Table 3 we provide for further details on the variable measurement.[24]

4.3. Results

We start with univariate comparisons of bond attributes between the pre- and post-cross-listing periods, and report results in Panel A of Table 4. In the first set of results, presented in the upper left-hand corner of the panel, we compare the 466 years with an active *EXCH* or *OTC* listing to the rest of the sample. As already noted, the average bond yield-to-maturity is higher for cross-listed firms, mainly because of the large proportion of Japanese firms in the benchmark group and because of the univariate nature of the analysis. At the same time, cross-listed firms issue larger bonds with longer maturities that are more likely to be investment grade, and have a call feature or

[24] We apply a similar sampling procedure for the *Loan Spread* analyses. That is, we pare down the propensity sample to syndicated loans with data available in Dealscan, require a minimum loan amount of US$ 10 million, only retain the loan with the largest facility amount per year, and require at least one ADR observation per country. The resulting sample comprises 2,785 loan issues from 38 countries, of which 24 percent are from ADR firms.

subordinated liquidation privileges. These bond attributes are all consistent with lower information asymmetries for ADR firms. When we limit the comparisons to cross-listed firms in the two years immediately before and after the cross-listing, separately for *PP*, *OTC*, and *EXCH*, most of the bond attributes do not differ across the pre and post period. This is little surprising in light of the small number of observations in each bin.

In Panel B of Table 4 we report coefficient estimates together with t-statistics (in parenthesis) from estimating Eq. (2). We assess the statistical significance based on standard errors with firm clustering. In Models 1 to 4 we use the bond yield-to-maturity as the dependent variable. The models differ with regard to the set of control variables we use. First, we only include the bond-specific controls (Model 1). Next, we recognize that bond features such as maturity or callability likely are determined simultaneously with offering yields. To avoid bias, we estimate Model 2 in a reduced form that only includes the firm-specific and macroeconomic controls (e.g., Qian and Strahan, 2007; Miller and Reisel, 2012). Models 3 and 4 include the full set of control variables. In the latter specification we replace *OTC* and *EXCH* with *XLIST* to allow comparisons with the cross-sectional analyses presented in Section 5 below.

Across all four models the coefficients on *EXCH* and *OTC* are negative and, with one exception, significant at the 5 percent level or better, indicating a decrease in offering yields after an equity cross-listing on a U.S. exchange or in the OTC markets. For exchange listings the offering yields are, on average, lower by about 50 basis points, which translates into yearly cost savings of US$ 1 million based on the average bond size of US$ 191 million. The results are similar in magnitude and significance levels for OTC firms. However, consistent with bonding and superior information disclosure playing at least a partial role, no such effects are apparent for PPs, which

bear only minimal legal consequences and have no extra disclosure requirements.[25] The results are also in line with the propensity analyses, suggesting that lower offering yields are one of the reasons why corporate bond issues become more popular after non-U.S. firms list their shares on a U.S. exchange. The control variables are mostly significant and load in the regressions as expected. The coefficients on the U.S. and local T-bill rates are positive, but fall well below the theoretical value of one, supporting our research design choice of using them as control variables instead of subtracting them from the bond yields. Larger bonds with longer maturities and with callable and subordinated features carry higher offering yields. Investment grade status and reputation in the bond market are awarded lower yields. Small, leveraged and less profitable firms from countries with more volatile exchange rates display significantly higher bond yields.

In Model 5, we report the syndicated loan results. Contrary to the corporate bond sample, we find that loan offering yield spreads are not affected by U.S. equity cross-listings, regardless whether we use *XLIST* or, not tabulated, *OTC* and *EXCH* in the model. This suggests that in markets with private monitoring and communication, opting out of the local institutional environment does not improve the lender's position, at least not in terms of interest yields. However, it could be that, because lenders can renegotiate contractual terms with borrowers at relatively low cost, they make other non-price adjustments to the loan terms such as increasing the number of protective covenants, adding performance pricing features, or requiring more revolving loans (e.g., Leftwich, 1983; Beatty, Weber, and Yu, 2008; Gigler et al., 2009).[26] The *Loan Spread* results are not affected by the inclusion of the comprehensive set of control variables, of which many are significant and have the expected sign. Overall, the loan results emphasize that in our setting lender specific monitoring and access to private information trumps the certification role of equity cross-listings in the U.S.

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[25] We note that contrary to the equity cross-listing literature (e.g., Doidge, Karolyi, and Stulz, 2004, 2009; Hail and Leuz, 2009), we do not find a larger effect on *EXCH* relative to *OTC*. This might be due to the nature of debt contracts or institutional forces differentially affecting debt and equity financing (see also Section 5).

[26] Lack of data for international firms in Dealscan does not allow us to pursue these alternative channels empirically.

4.4. Sensitivity Analyses

To assess the sensitivity of the bond yield-to-maturity results, we conduct several robustness tests and summarize them in Table 5. The table presents only the coefficient estimates of the cross-listing indicators, but we include all the control variables as in Model 3 of Table 4. In Panel A, instead of raw offering yields, we use the yield spreads as the dependent variable, either computed by subtracting U.S. T-bill rates or local T-bill rates from the bond offering yield. The first adjustment accounts for common time preferences among investors, while the second considers factors like the sovereign risk or inflation in the issuing firm's country of domicile. In untabulated analyses we also subtract the currency-matched T-bill rate from the offering yield. In all these sensitivity tests we find that the yield effects of U.S. equity cross-listings are very similar if not slightly stronger than those reported in the main analyses.

In Panel B, we examine alternative sample selection choices. First, in line with Qi, Roth, and Wald (2010), we only include US$ denominated bonds in the sample. Even though the number of observations shrinks substantially, the coefficient on *EXCH* remains significantly negative and increases in magnitude.[27] Second, we assess the impact of Japan, the country with the largest number of observations, on the results. We do so by randomly selecting only 300 Japanese firm-year observations, which reduces Japan's weight to a level comparable with other large sample countries like Canada or South Korea. While the coefficient estimates are similar in magnitude and consistent with the main tests, the *EXCH* variable is only significant at the 10 percent level reflecting the loss in power due to the smaller sample. Third, we allow for multiple bond offerings per firm and year, increasing the number of observations to 5,085. The results remain largely unchanged. Finally, we find that including convertible bonds does not significantly alter the results.

[27] Note that Qi, Roth, and Wald (2010) only observe a significantly negative coefficient on the cross-listing variable in their Yankee bond sample, but not for the Eurobonds. However, we cannot directly compare our results with those of Qi et al. because they focus on the Eurobond market, consider only bonds denominated in US$, and include floating rate bonds.

In Panel C, we investigate the potential variable bias due to the endogenous nature of firms' cross-listing decision. It is possible that the *Cross-listing Firm* indicator does not adequately control for (unobserved) factors affecting both firms' cross-listing status and external financing behavior. To address this concern, we first include the inverse Mills ratio from a selection model of the U.S. cross-listing decision in the regression. That is, we model *EXCH* (*XLIST*) as a function of the same set of firm-specific variables we use in our propensity tests (see Table 2) plus the percentage of foreign sales and Altman's (1968) Z-score. We then estimate the resulting probit regression separately for each year, and compute the inverse Mills ratios, which we include in the second stage. Our second approach of dealing with potential self-selection is to eliminate the bond offerings in the two years immediately subsequent to the cross-listing. This helps mitigate the impact of anticipating future bond benefits when firms decide to cross list their shares in the U.S. Finally, we interact the *Cross-listing Firm* indicator with all the firm-specific control variables allowing the weight on these variables to vary between ADR and non-ADR firms. Across all these tests for endogeneity, the results remain very similar to our main findings, and none of the inferences change.

5. Cross-Sectional Analysis of Debt Market Benefits of U.S. Equity Cross-Listings

5.1. Research Design

In the cross-sectional analyses we exploit various bond characteristics (i.e., public offerings vs. private placements, and the location of the bond offering) as well as institutional features of the issuing firm's country of domicile to shed light on the underlying factors driving the debt-related benefits of U.S. equity cross-listings. In doing so, we first employ the propensity of external financing model as outlined in Eq. (1), but use different binary indicators as dependent variables: (i) *Public Bonds* for public bond offerings, (ii) *Non-U.S. Bonds* for bonds issued either at home or in the Eurobond market, and (iii) *Yankee Bonds* for bonds issued by foreign firms in the U.S. Next, still using the model in Eq. (1), we partition the cross-listed firms into two groups based on

institutional characteristics in their country of domicile, and examine whether the propensity of issuing bonds systematically differs across the two groups. We limit this analysis to only the *XLIST* firm-years, and therefore do not have to worry about self-selection as all firms have already cross-listed their shares in the U.S. Because the partitioning is at the country-level, we cannot include country fixed effects in the regressions. Instead we add the logarithm of the annual *GDP* as a supplementary control variable to the model.

We use the following partitioning variables in the cross-sectional propensity analyses: (i) we distinguish between code law and common law countries (equal to '1'), reflecting countries' *Legal Tradition* (La Porta et al., 1997; Ball, Kothari, and Robin, 2000). Under common law regimes accounting practices are determined primarily in the private sector, and investors express a high demand for high quality reporting. In addition, better legal protection allows borrowers to receive better terms, favoring the use of public debt financing. (ii) We use the Djankov et al. (2008) *Debt Enforcement* score, measured as the discounted terminal value of a typical firm after bankruptcy costs. Higher values stand for countries with better chances of debt recovery and quicker resolution of uncertainty. (iii) We employ the quality of a country's *Auditing and Reporting Standards*, as measured by the survey results of the Global Competitiveness Report for the years 2003/04. Higher values represent stronger reporting and auditing quality. (iv) We consider the relative importance of the bond market by computing the *Equity-to-Bond Market* ratio as countries' aggregate market capitalization of stocks divided by the market capitalization of public bonds. Higher values indicate countries in which bond markets are relatively less important and hence, suggest lower market liquidity for debt instruments. Table 6 presents the raw values of the partitioning variables for each country and, in the notes, provides further details on the variable measurement. For the continuous measures we also tabulate the binary indicators used in the propensity analyses to partition the *XLIST* observations into two groups (with the sample median as cut-off value).

In a final set of cross-sectional tests, we apply the bond yield-to-maturity model from Eq. (2) to various subsamples of the actual bond offerings data (i.e., public bonds, private bonds, bonds issued outside the U.S., and Yankee bonds). Because the sample size in those analyses is substantially smaller, we cannot reasonably partition the offering yields of the cross-listed firms based on the institutional forces in their country of domicile.

5.2. Bonding and Information Disclosure Hypothesis

We first test the bonding and information disclosure arguments which indicate that the largest debt-related benefits of equity cross-listings should accrue to public bond offerings and to firms domiciled in countries with relatively weaker creditor protection and disclosure requirements, in particular if they raise debt capital in their home country or some other non-U.S. market. As long as equity cross-listings come at a cost (e.g., in terms of heightened threats of litigation) and allow firms to credibly commit to improved transparency, they should reduce the agency costs of debt. We examine these assertions separately for public bond offerings and offerings outside the U.S., and report results in Table 7.

In Panel A of Table 7 we present the propensity of debt financing results using *Public Bonds* as the dependent variable. Models 1 and 2 comprise the full sample and only differ with regard to the cross-listing types we include (*OTC* and *EXCH* vs. *XLIST*). In both cases the coefficients on the cross-listing variables are positive and significant, indicating a higher likelihood of public bond offerings. This is consistent with a reduction in information asymmetries and better quality public disclosures, which lets debt holders delegate and share the monitoring function and rely more on country-level enforcement mechanisms. In Models 3 to 5, we examine whether the propensity to issue public bonds systematically differs across countries, conditional on the firms being cross-listed in the U.S. We find that ADR firms in code law countries and in countries with relatively weak auditing and reporting standards are more likely to engage in public bond offerings than ADR

firms from a common law legal tradition or an already transparent disclosure regime. The partitioning based on countries' debt enforcement quality produces insignificant results.

In Panel B of Table 7, we report results from the same set of propensity analyses, but now use *Non-U.S. Bonds* as the dependent variable (i.e., the combination of issuing domestic bonds or Eurobonds). The cross-listing variables in the first two models are positive, but only marginally significant. Thus, there is only weak evidence that firms engage in more corporate bond offerings at home or in the Eurobond market after equity cross-listings. More importantly, though, when we partition the ADR firms according to their home country institutions, we find firms in code law countries with weak local debt enforcement and auditing and reporting standards are more likely to issue bonds domestically or outside the U.S. This result is in line with Reese and Weisbach (2002), and together with the public bond results in Panel A suggests that legal bonding and information disclosure stemming from equity cross-listings facilitate debt financing in public debt markets and in countries with poor investor protection and transparency.

In Panel C of Table 7 we present the bond yield-to-maturity results, separately for public bonds, privately-placed bonds, and bonds issued outside the U.S. We find that public bonds and issues of domestic bonds or Eurobonds benefit from lower offering yields after a U.S. equity cross-listing, consistent with the propensity results. No such effect is apparent for privately placed bonds. The latter finding corroborates the syndicated loan results, which also do not exhibit lower yield spreads following the cross-listing (see Table 4, Panel B). Overall, the results reported in Table 7 indicate that the bonding and information disclosure hypothesis explains to some extent the main results we document in Sections 3 and 4. ADR firms issue more bonds at lower rates in markets where the demand for information and enforcement is higher. Debt contracts with private monitoring and privileged access to information, however, rely less on the certification role of equity cross-listings.

5.3. Liquidity and Visibility Hypothesis

Under the liquidity and visibility hypothesis the debt-related benefits of equity cross-listings should primarily accrue to firms located in countries with strong institutional forces and high quality disclosure standards, but with relatively underdeveloped bond markets. These firms, attracted by the sheer size and the liquidity of the U.S. debt market as well as the exposure to U.S. individual and institutional investors, should raise more debt capital in the form of Yankee bonds. We test this prediction using our propensity of issuing debt and bond yield-to-maturity framework, and report results in Table 8.

In Panel A of Table 8 we present the propensity results using *Yankee Bonds* as the dependent variable. Models 1 and 2 use all available observations. In the first model, the coefficient on *EXCH* is positive and significant, indicating that foreign firms with a U.S. exchange listing have a higher likelihood of issuing Yankee bonds. The same result applies for the aggregate *XLIST* variable. This is consistent with liquidity and visibility gains from tapping into the U.S. debt markets that reduces trading costs and makes information more widely available. In Models 3 to 5 we limit the analyses to firms with a cross-listing and examine whether the propensity of issuing Yankee bonds differs systematically across countries. We find that ADR firms from countries with already efficient debt enforcement procedures issue Yankee bonds more frequently than their counterparts from countries with weak creditor protection. This is consistent with the former group benefitting primarily from the access to the U.S. capital market and less from its legal and disclosure features. The results for the two other partitioning variables are not significant at conventional levels.

In Panel B of Table 8 we present the bond yield-to-maturity results. Here we interact the cross-listing indicators (*OTC*, *EXCH* and *XLIST*) with the *Yankee Bonds* variable, which lets us separately estimate the incremental effects of U.S. equity cross-listings for the subset of bond issues in the U.S. The cross-listing main effects reflect the yield-to-maturity consequences for the bonds

issued outside the U.S. We find that both the interaction coefficients with *EXCH* in Model 1 and with *XLIST* in Model 2 are negative and significant at the 11 percent level or better, suggesting that ADR firms pay lower interest rates on Yankee bonds. Overall, the results reported in Table 8 indicate that the liquidity and visibility hypothesis also helps to partially explain the results we provide in our main analyses. Firms issue more and cheaper bonds in the U.S. after cross-listing, consistent with improved access to a larger and more liquid market.

6. Conclusion

In this paper, we examine whether cross listing equity shares in the U.S. facilitates non-U.S. firms' access to debt markets. This is important because, on a global basis, debt markets are a much larger source of external finance than equity markets. Moreover, prior literature primarily focuses on the equity market benefits associated with U.S. cross-listings, which stem from the comparative advantages of both the U.S capital markets with their depth and liquidity and the U.S. judicial system with its more transparent disclosures, investor protection and effective monitoring. Similar benefits should extend to the debt holders of cross-listed firms, particularly to investors in public bonds. Yet, poor creditor protection in cross-listed firms' countries of domicile, which often determine the quality of debt enforcement and the legal procedures in case of default, as well as the higher agency costs between debt and equity holders in light of the expanded growth options around equity cross-listings might offset these benefits.

To explore the above questions, we employ a large global sample of corporate bonds and syndicated loans, of which about one fifth were issued after firms had cross-listed their shares in the U.S. We start with an analysis of the incidence of external capital raising, and find that non-U.S. firms with U.S. exchange-listings are more likely to issue bonds and equity, but at the same time enter into fewer syndicated loan agreements. These bonds have lower offering yields by about 50 basis points. No such yield reduction is apparent for loans. Consistent with the bonding and

information disclosure argument, we further find that exchange and OTC cross-listed firms issue more public bonds, at lower rates. They also issue more and cheaper bonds domestically or in the Eurobond market, in particular if domiciled in countries with relatively weaker legal institutions and lower quality information environments. In line with improved liquidity and visibility from tapping into U.S. capital markets, we find that firms issue more Yankee bonds at lower rates after an equity cross-listing, especially if located in a country with relatively efficient debt enforcement procedures.

Finally, several caveats are in order. First, our analysis focuses on two out of many possible external-funding sources available to firms (bonds and syndicated loans). We therefore capture only an incomplete picture of the complex issues firms face when selecting their funding strategy. Second, our evidence suggests that having shares cross-listed in the U.S., under certain conditions, generates benefits for the debt holders of the firm. However, our analyses cannot completely eliminate the possibility that the causality runs the other way, i.e., that cross-listings are undertaken in light of already lower costs of public debt financing. Yet, it would be hard to imagine that the decision to cross-list in the U.S. varies systematically across our partitions based on different types of ADR listings, the location of the capital raising, publicly offered versus privately placed debt contracts, and country characteristics. Third, we provide circumstantial evidence in support of the legal bonding, information disclosure and liquidity arguments of cross-listing. However, more evidence on the complex interplay between these forces is needed. We leave this to future research.

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TABLE 1

Sample Composition and Descriptive Statistics for Propensity of Debt or Equity Financing Analyses

Panel A: Number of Observations, Type of U.S. Equity Cross-Listing, Debt and Equity Financing by Country

			Firm-Years with U.S. Equity Cross-Listings			*Firm-Years with Debt or Equity Financing*		
Country	*Unique Firms*	*Firm-Years*	*PP*	*OTC*	*EXCH*	*Bond Issue*	*Loan Issue*	*Equity Issue*
Argentina	67	295	26	13	68	28	17	6
Australia	1,425	6,236	45	449	154	82	333	1,463
Austria	91	528	31	122	6	7	11	42
Belgium	108	603	0	23	5	5	32	39
Brazil	219	643	28	41	94	12	31	18
Canada	1,622	7,709	0	280	1,225	302	655	1,584
Chile	139	996	12	8	124	18	49	29
China	1,431	5,873	49	73	94	8	32	335
Colombia	27	145	25	0	0	1	11	1
Denmark	180	1,400	0	0	32	9	20	67
Egypt	17	70	25	0	0	2	2	3
Finland	146	1,048	33	14	46	15	72	64
France	814	4,323	47	105	210	196	284	268
Germany	772	4,493	40	113	132	80	166	344
Greece	177	462	26	5	11	2	31	14
Hong Kong	816	4,435	14	470	67	48	255	496
India	476	2,481	429	7	27	100	164	40
Israel	157	757	1	8	77	5	18	69
Italy	276	1,608	60	13	74	26	79	122
Japan	3,748	20,204	6	197	238	1,119	1,862	1,347
Korea (South)	902	4,675	137	4	55	496	291	256
Luxembourg	21	107	1	2	39	7	5	14
Malaysia	863	4,730	0	67	0	65	288	418
Mexico	133	885	119	184	235	50	90	39
The Netherlands	234	1,601	42	89	182	68	118	115
New Zealand	115	645	0	5	30	9	52	38
Norway	245	1,354	26	66	50	27	95	130
Pakistan	82	580	18	0	0	1	19	3
Peru	63	355	13	15	20	24	9	5
Philippines	135	805	46	44	11	16	56	38
Poland	102	536	69	17	1	1	16	11
Portugal	95	577	22	15	20	4	10	26
Singapore	600	3,252	12	127	13	65	192	339
South Africa	467	2,345	62	204	88	5	22	24
Spain	73	124	2	3	6	4	20	12

(continued)

TABLE 1 — *Continued*

			Firm-Years with U.S. Equity Cross-Listings			*Firm-Years with Debt or Equity Financing*		
Country	*Unique Firms*	*Firm-Years*	*PP*	*OTC*	*EXCH*	*Bond Issue*	*Loan Issue*	*Equity Issue*
Sri Lanka	23	121	10	0	0	1	1	1
Sweden	348	1,958	4	47	91	25	107	180
Switzerland	238	1,724	28	41	72	70	69	67
Taiwan	1,111	5,822	332	0	44	201	574	514
Thailand	417	2,529	20	82	1	91	231	194
Turkey	125	298	26	6	5	2	11	6
United Kingdom	2,264	12,437	60	431	548	195	750	1,448
Venezuela	22	101	7	23	19	3	5	2
Total	21,386	111,870	1,953	3,413	4,214	3,495	7,155	10,231

Panel B: Number of Observations, Type of U.S. Equity Cross-Listing, Debt and Equity Financing by Year

		Firm-Years with U.S. Equity Cross-Listings			*Firm-Years with Debt or Equity Financing*		
Year	*Firm-Years*	*PP*	*OTC*	*EXCH*	*Bond Issue*	*Loan Issue*	*Equity Issue*
1992	108	0	2	0	5	2	8
1993	415	5	8	11	20	5	41
1994	2,355	30	87	112	91	97	216
1995	4,140	79	171	197	171	228	253
1996	5,255	144	223	240	269	354	376
1997	5,634	156	251	289	236	438	360
1998	6,255	165	267	332	230	381	402
1999	7,051	191	284	354	218	402	500
2000	10,879	195	314	419	334	581	1,031
2001	12,375	186	349	453	387	783	873
2002	13,507	175	356	454	364	818	1,185
2003	13,937	196	370	467	411	890	1,413
2004	14,720	205	366	453	388	1,032	1,840
2005	15,239	226	365	433	371	1,144	1,733
Total	111,870	1,953	3,413	4,214	3,495	7,155	10,231

(continued)

TABLE 1 — *Continued*

Panel C: Descriptive Statistics for Variables Used in Propensity of Debt or Equity Financing Regression Analyses

Variables (N=111,870)	*Mean*	*Std. Dev.*	*P1*	*P25*	*Median*	*P75*	*P99*
Cross-listing variables (indicators):							
PP	0.02	0.13					
OTC	0.03	0.17					
EXCH	0.04	0.19					
XLIST	0.07	0.25					
Cross-listing firm	0.10	0.30					
Firm-specific control variables:							
Loan-issuing firm (indicator)	0.23	0.42					
Bond-issuing firm (indicator)	0.16	0.36					
Equity-issuing firm (indicator)	0.39	0.49					
Total assets (US$ million)	1,341.7	6,943.6	2.5	49.7	152.2	518.6	22,372.5
Leverage (ratio)	0.115	0.130	0.000	0.003	0.071	0.184	0.535
Tangibility (ratio)	0.345	0.226	0.004	0.165	0.316	0.494	0.895
Return on assets (ratio)	0.039	0.111	-0.410	0.008	0.049	0.097	0.262
Negative earnings (indicator)	0.22	0.41					
Funding needs (ratio)	-0.049	0.115	-0.282	-0.109	-0.059	-0.008	0.357
Market-to-book (ratio)	2.100	2.425	0.291	0.819	1.402	2.426	12.878
Return variability (std. dev.)	0.128	0.080	0.027	0.073	0.107	0.158	0.423

The propensity of debt or equity financing sample comprises a maximum of 111,870 firm-year observations from 43 countries between 1992 and 2005 for which sufficient Worldscope financial data exist. We exclude financial firms (one-digit SIC code equal to 6), and require at least one American Depositary Receipt (ADR) or direct listing in the U.S. for a country to be included. The table reports the number of unique firms, total firm-years, and firm-years with ADRs, debt or equity issues by country (Panel A) and year (Panel B). In Panel C, we report descriptive statistics for the cross-listing and firm-specific control variables used in the propensity analyses. The ADR variables consist of the following binary indicators (see Hail and Leuz, 2009, for details): *PP* is equal to 1 if the firm has a private placement under Rule 144A in the U.S., *OTC* is equal to 1 if firm shares trade in the U.S. over-the-counter markets, and *EXCH* is equal to 1 if firm shares are listed on the NYSE, Nasdaq or Amex. For some specifications, we aggregate the *OTC* and *EXCH* variables into a single *XLIST* variable. We also define a *Cross-listing Firm* indicator, set equal to 1 if the firm has ADRs outstanding during the sample period. The debt and equity financing variables consist of the following binary indicators: *Bond Issue* is equal to 1 if the firm undertakes a public or private fixed-rate bond offering (source: Thompson Deals and Mergent), *Loan Issue* is equal to 1 if the firm undertakes a syndicated loan offering (source: Dealscan), and *Equity Issue* is equal to 1 if the firm externally raises shareholders' equity capital (source: SDC Platinum). All three variables are measured in any given year. We also define separate *Bond-*, *Loan-*, and *Equity-issuing Firm* indicators, set equal to 1 if the firm engages in the respective debt or equity financing transactions during the sample period. The remaining firm-specific controls consist of the following variables: *Total Assets* are denominated in US$ million. *Leverage* is the ratio of long-term debt divided by total assets. *Tangibility* is measured as the ratio of the book value of property, plant and equipment divided by total assets. *Return on Assets* is the ratio of operating income divided by average total assets. *Negative Earnings* is an indicator variable equal to 1 if the firm reports negative operating income in a given year. We compute *Funding Needs* as net cash flows from operations divided by total assets, and multiply this measure by -1 so that higher values indicate higher funding needs. *Market-to-Book* is the ratio of market value of equity divided by book value of equity. *Return Variability* is the annual standard deviation of monthly stock returns, computed using Datastream stock price information. Accounting data and market values are measured as of the fiscal-year end. Except for variables with natural lower or upper bounds, we truncate all variables at the first and 99th percentile.

TABLE 2

Change in Propensity of Debt or Equity Financing after U.S. Equity Cross-Listings

Panel A: Univariate Analysis of Bond, Loan, and Equity Issuance Surrounding U.S. Equity Cross-Listings

	XLIST vs. Rest of Sample			*Pre- vs. Post-EXCH (+/- 2 years)*		
	Prior to U.S. Cross-Listing	*Following U.S. Cross-Listing*	*P-Value of Difference*	*Prior to U.S. Cross-Listing*	*Following U.S. Cross-Listing*	*P-Value of Difference*
Firm-years	104,291	7,579		342	760	
Percent issuing bonds	2.60%	10.28%	0.000	6.43%	11.05%	0.016
of which:						
- Yankee bonds	0.24%	2.65%	0.000	2.05%	3.95%	0.105
- Domestic bonds	1.75%	3.84%	0.000	2.05%	3.29%	0.256
- Eurobonds	0.64%	3.95%	0.000	2.63%	3.95%	0.275
- Public bonds	1.63%	7.60%	0.000	5.26%	8.16%	0.087
- Private bonds	0.98%	2.68%	0.000	1.17%	2.89%	0.081
Percent issuing loans	5.79%	14.71%	0.000	11.70%	17.11%	0.021
Percent issuing equity	8.93%	12.15%	0.000	17.84%	27.63%	0.000
Number of bond issues per firm	0.132	0.649	0.000	0.106	0.191	0.025
Number of loan issues per firm	0.293	0.929	0.000	0.192	0.295	0.027
Number of equity issues per firm	0.451	0.767	0.000	0.293	0.477	0.000

	Pre- vs. Post-OTC (+/- 2 years)			*Pre- vs. Post-PP (+/- 2 years)*		
	Prior to U.S. Cross-Listing	*Following U.S. Cross-Listing*	*P-Value of Difference*	*Prior to U.S. Cross-Listing*	*Following U.S. Cross-Listing*	*P-Value of Difference*
Firm-years	546	639		185	337	
Percent issuing bonds	6.96%	4.85%	0.123	11.35%	11.28%	0.979
of which:						
- Yankee bonds	1.10%	0.47%	0.214	5.95%	5.93%	0.996
- Domestic bonds	2.20%	2.82%	0.499	4.86%	2.97%	0.269
- Eurobonds	3.66%	1.56%	0.022	1.62%	2.37%	0.568
- Public bonds	3.85%	3.60%	0.823	4.32%	3.56%	0.665
- Private bonds	3.11%	1.25%	0.026	7.03%	7.72%	0.775
Percent issuing loans	11.17%	10.49%	0.704	20.00%	19.29%	0.845
Percent issuing equity	16.67%	11.89%	0.019	11.89%	19.29%	0.030
Number of bond issues per firm	0.107	0.082	0.295	0.189	0.185	0.943
Number of loan issues per firm	0.172	0.178	0.876	0.333	0.317	0.821
Number of equity issues per firm	0.257	0.202	0.130	0.198	0.317	0.044

(continued)

TABLE 2 — *Continued*

Panel B: Probit Regression Analysis of Bond, Loan, and Equity Issuance Surrounding U.S. Equity Cross-Listings

	Bond Issue as Dependent Variable				*Loan Issue as Dependent Variable*		*Equity Issue as Dependent Variable*	
Variables	*Model 1 (all firms)*	*Model 2 (ADR firms only)*	*Model 3 (debt issuing firms only)*	*Model 4 (firm-years with debt issuances only)*	*Model 1 (all firms)*	*Model 2 (ADR firms only)*	*Model 1 (all firms)*	*Model 2 (ADR firms only)*
Cross-listing variables:								
PP	0.161**	0.173**	0.160*	0.173	0.067	-0.026	0.121*	-0.029
	(1.98)	(2.01)	(1.92)	(1.40)	(0.95)	(-0.35)	(1.75)	(-0.37)
OTC	0.087	0.105	0.072	0.209*	-0.275***	-0.143**	-0.234***	-0.164***
	(1.10)	(1.26)	(0.88)	(1.74)	(-4.10)	(-2.00)	(-3.94)	(-2.70)
EXCH	0.195***	0.137*	0.190**	0.415***	-0.305***	-0.206***	0.073	0.104*
	(2.59)	(1.75)	(2.46)	(3.51)	(-4.49)	(-2.79)	(1.23)	(1.76)
Cross-listing firm	-0.046	n.a.	-0.078	-0.178*	0.159***	n.a.	0.158***	n.a.
	(-0.67)		(-1.15)	(-1.67)	(2.83)		(3.11)	
Firm-specific control variables:								
Loan-issuing firm	0.262***	0.213***	-0.451***	n.a.	n.a.	n.a.	0.106***	0.040
	(9.12)	(3.26)	(-13.95)				(5.44)	(0.74)
Equity-issuing firm	0.201***	0.347***	0.127***	0.200***	0.133***	0.085	n.a.	n.a.
	(7.61)	(6.00)	(4.39)	(4.35)	(6.32)	(1.54)		
Bond-issuing firm	n.a.	n.a.	n.a.	n.a.	0.223***	0.237***	0.095***	0.238***
					(8.57)	(3.86)	(4.17)	(4.36)
Log(total assets)	0.310***	0.263***	0.273***	0.317***	0.287***	0.242***	-0.033***	-0.037**
	(31.96)	(11.80)	(24.73)	(18.54)	(38.09)	(11.42)	(-6.11)	(-2.35)
Leverage	1.849***	2.072***	1.784***	1.494***	1.397***	1.436***	-0.003	0.050
	(20.72)	(10.27)	(17.05)	(8.70)	(19.69)	(8.26)	(-0.05)	(0.31)
Tangibility	-0.045	-0.022	0.051	0.159	0.008	-0.089	0.062*	0.070
	(-0.66)	(-0.14)	(0.67)	(1.34)	(0.17)	(-0.70)	(1.84)	(0.65)
Return on assets	-0.170	0.163	-0.176	0.150	0.443***	-0.065	1.160***	0.212
	(-0.70)	(0.32)	(-0.59)	(0.30)	(3.00)	(-0.17)	(12.55)	(0.73)
Negative earnings	-0.054	-0.051	-0.039	-0.083	-0.121***	-0.036	0.074***	0.081
	(-1.34)	(-0.56)	(-0.84)	(-1.03)	(-3.94)	(-0.44)	(3.66)	(1.20)
Funding needs	0.818***	0.458	1.005***	0.786**	0.278**	-0.262	1.058***	0.637***
	(5.11)	(1.19)	(4.99)	(2.30)	(2.53)	(-0.82)	(16.04)	(2.64)
Market-to-book	0.026***	0.032***	0.031***	0.039***	-0.006	-0.015	0.053***	0.040***
	(5.80)	(3.76)	(5.77)	(3.59)	(-1.37)	(-1.59)	(24.54)	(6.55)
Return variability	-0.340*	-0.814**	-0.446**	-1.721***	0.487***	0.041	1.087***	1.188***
	(-1.80)	(-1.97)	(-2.16)	(-4.96)	(4.25)	(0.13)	(13.80)	(4.41)
Country, industry, and year fixed effects	included	included	included	included	included	included	included	included
Pseudo R^2	32.21%	25.36%	17.66%	21.98%	22.43%	17.19%	9.92%	9.89%
N	111,870	10,736	32,919	8,371	111,748	10,836	111,870	10,830

(continued)

TABLE 2 — *Continued*

The propensity of debt or equity financing sample comprises a maximum of 111,870 firm-year observations from 43 countries between 1992 and 2005. In Panel A, we report the percent of firm-years with debt or equity financing (the average number of debt and equity issues per firm) prior to and following a U.S. equity cross-listing together with the p-values for the statistical significance of the differences. We compare firms with shares traded in the U.S. over-the-counter markets or listed on a U.S. exchange (*XLIST* = 1) to the rest of the sample, as well as the two years immediately before and after a *PP*, *OTC*, or *EXCH* listing in the U.S. We also report the percentages of bonds issued in the U.S. (*Yankee Bonds*), bonds issued in the firms' country of domicile (*Domestic Bonds*), bonds issued abroad but not in the U.S. (*Eurobonds*), bonds issued in a public market offering (*Public Bonds*), and privately placed bonds (*Private Bonds*). For a description of the remaining debt and equity financing variables see Table 1. In Panel B, we report coefficient estimates and (in parentheses) z-statistics based on standard errors clustered by firm from probit regressions of debt or equity issuance on firms' cross-listing status and various control variables. We report results for three binary dependent variables, each measured on a yearly basis: (1) *Bond Issue* represents public or private bond offerings, (2) *Loan Issue* stands for syndicated loan offerings, and (3) *Equity Issue* marks offerings of shareholders' equity capital. For a description of the cross-listing variables and the firm-specific control variables see Table 1. We use log transformations where indicated, and include country, one-digit SIC industry, and year fixed effects in the regressions, but do not report the coefficients. Model 1 uses all Worldscope observations. Model 2 limits the sample to ADR firms. In Model 3 we only include firms that at some point during the sample period issued bonds or syndicated loans (i.e., debt issuing firms). In Model 4 we limit the sample to firm-years with bond or loan issuances. That is, a value of 1 of the dependent variable stands for the issuance of bonds and a value of 0 for syndicated loans. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

TABLE 3

Sample Composition and Descriptive Statistics for Bond Yield-to-Maturity Analyses

Panel A: Number of Observations, Type of U.S. Equity Cross-Listing, and Mean Bond Yield-to-Maturity by Country

			Firm-Years with U.S. Equity Cross-Listings			*Mean Bond Yield-to-Maturity*	
Country	*Unique Firms*	*Firm-Years*	*PP*	*OTC*	*EXCH*	*Non-ADRs*	*ADRs*
Argentina	1	1	0	0	1	n.a.	7.43%
Australia	19	37	4	11	6	6.04%	6.27%
Belgium	4	4	0	0	1	6.68%	5.14%
Brazil	10	10	1	1	3	9.92%	8.97%
Canada	118	235	0	1	76	7.40%	6.69%
Chile	7	8	0	0	4	6.67%	7.57%
China	1	1	0	1	0	n.a.	4.29%
Finland	10	16	0	0	8	8.78%	5.84%
France	38	103	12	5	15	5.15%	5.09%
Germany	32	49	0	7	7	5.94%	4.00%
Greece	1	1	0	0	1	n.a.	4.42%
Hong Kong	7	7	0	0	1	7.36%	8.75%
India	9	13	7	0	0	8.68%	7.60%
Italy	12	20	2	0	8	5.83%	6.00%
Japan	584	1,569	0	61	62	2.42%	2.33%
Korea (South)	95	194	43	1	11	6.90%	6.59%
Luxembourg	5	8	3	1	1	6.54%	5.55%
Malaysia	27	36	0	3	0	5.62%	5.38%
Mexico	13	15	2	2	8	7.74%	7.61%
The Netherlands	11	20	2	7	9	3.90%	6.44%
New Zealand	5	7	0	0	2	7.45%	6.57%
Norway	5	7	0	2	5	n.a.	5.61%
Peru	6	17	0	1	7	6.95%	8.89%
Philippines	2	2	0	1	0	8.16%	9.09%
Portugal	2	2	0	0	1	4.80%	3.84%
Singapore	20	34	0	6	2	3.75%	4.18%
South Africa	2	2	0	0	1	10.70%	3.38%
Spain	10	22	0	1	6	6.93%	7.12%
Sweden	12	29	0	2	19	6.91%	6.64%
Switzerland	31	52	0	0	1	4.03%	3.77%
Taiwan	44	62	17	0	0	3.38%	4.28%
United Kingdom	75	155	1	32	54	7.35%	6.14%
Total	1,218	2,738	94	146	320	3.72%	5.36%

(continued)

TABLE 3 — *Continued*

Panel B: Descriptive Statistics for Variables Used in Bond Yield-to-Maturity Regression Analyses

Variables (N=2,738)	*Mean*	*Std. Dev.*	*P1*	*P25*	*Median*	*P75*	*P99*
Dependent variable:							
Bond yield-to-maturity (percent)	4.06%	2.70%	0.40%	1.98%	3.27%	5.93%	11.81%
Cross-listing variables (indicators):							
PP	0.03	0.18					
OTC	0.05	0.22					
EXCH	0.12	0.32					
XLIST	0.17	0.38					
Cross-listing firm	0.23	0.42					
Bond-specific control variables:							
U.S. T-bill rate (percent)	5.20%	1.31%	1.89%	4.28%	5.42%	6.23%	7.59%
Local T-bill rate (percent)	3.54%	2.27%	0.54%	1.48%	3.51%	5.05%	10.27%
Bond maturity (months)	79.2	45.8	24.0	48.7	60.9	97.4	259.6
Bond size (US$ million)	191.5	211.4	12.2	59.7	110.0	250.0	1,027.7
Investment grade (indicator)	0.41	0.49					
Callable (indicator)	0.16	0.36					
Subordinated (indicator)	0.01	0.08					
Previous bond issues (indicator)	0.58	0.49					
Firm-specific and macroeconomic control variables:							
Total assets (US$ million)	11,965.1	22,376.1	139.2	1,237.9	3,852.0	12,401.2	116,367.9
Market-to-book (ratio)	2.093	1.856	0.338	1.156	1.667	2.422	9.974
Leverage (ratio)	0.252	0.136	0.001	0.159	0.230	0.324	0.620
Tangibility (ratio)	0.425	0.231	0.042	0.248	0.389	0.580	0.917
Return on assets (ratio)	0.052	0.044	-0.052	0.026	0.045	0.070	0.192
Inflation (percent)	1.26%	1.42%	-0.88%	0.15%	1.22%	1.98%	5.36%
GDP (log US$)	14.432	1.194	10.974	13.407	15.277	15.334	15.421
Country creditworthiness (rating)	85.1	10.1	42.7	82.3	89.6	91.3	94.2
Exchange rate volatility (ratio)	0.034	0.022	0.000	0.020	0.032	0.045	0.076

(continued)

TABLE 3 — *Continued*

The bond yield-to-maturity sample comprises a maximum of 2,738 firm-year observations from 32 countries between 1992 and 2005 for which sufficient bond-specific data from Thompson Deals and Mergent, and firm-specific data from Worldscope exist. We exclude financial firms (one-digit SIC code equal to 6), only retain non-convertible fixed-rate bonds, require a minimum bond amount of 10 US$ million, and limit the sample to observations from firms domiciled in countries with at least one American Depositary Receipt (ADR) or direct listing in the U.S. If a firm has multiple issues in a given year, we retain only the bond with the largest principal amount. Panel A reports the number of unique firms, total and ADR firm-year observations, as well as mean ADR and non-ADR bond yield-to-maturity values by country. In Panel B, we report descriptive statistics for the dependent and independent variables used in the yield-to-maturity analyses. The dependent variable is the *Bond Yield-to-Maturity* measured at the time of the issuance of the bond. The ADR variables consist of the following binary indicators (see Hail and Leuz, 2009, for details): *PP* is equal to 1 if the firm has a private placement under Rule 144A in the U.S., *OTC* is equal to 1 if firm shares trade in the U.S. over-the-counter markets, and *EXCH* is equal to 1 if firm shares are listed on the NYSE, Nasdaq or Amex. We only retain ADR firms with a single cross-listing type over the sample period. For some specifications, we aggregate the *OTC* and *EXCH* variables into a single *XLIST* variable. We also define a *Cross-listing Firm* indicator, set equal to 1 if the firm has ADRs outstanding during the sample period. We use the following bond-specific control variables: *U.S. T-Bill Rate* and *Local T-Bill Rate* are the yields of U.S. Treasury securities or government securities in the issuing firm's country of domicile with similar maturity and coupon rate as the bond issued. If no long-term government securities are available, we use short-term risk-free interest rates instead. *Bond Maturity* is measured in months at the date of the issuance. *Bond Size* equals the principal amount in US$ million. *Investment Grade* is an indicator variable equal to 1 if the bond's credit rating is BBB- or higher by Standard & Poor's or Baa3 or higher by Moody's. If credit ratings are missing, we compute Altman's (1968) Z-score as (1.2*working capital + 1.4*retained earnings + 3.3*EBIT + 0.999*sales)/total assets + (0.6*market value of equity/book value of total liabilities), and use 2.675 as cutoff value to assign investment grade status. *Callable* and *Subordinated* are indicator variables set equal to 1 if the issuer of the bond retains the privilege of redeeming the bond before maturity, or if the bond ranks after other debts in case of liquidation. *Previous Bond Issues* is an indicator variable equal to 1 if the firm has issued another bond within the last two fiscal years. We use the following firm-specific and macroeconomic control variables: *Total Assets* are denominated in US$ million. *Market-to-Book* is the ratio of market value of equity divided by book value of equity. *Leverage* is the ratio of long-term debt divided by total assets. *Tangibility* is measured as the ratio of the book value of property, plant and equipment divided by total assets. *Return on Assets* is the ratio of operating income divided by average total assets. *Inflation* is the yearly median of country-specific monthly percentage changes in the consumer price index as reported in Datastream. *GDP* is the natural log of countries' annual gross domestic product (in constant US$), as reported by the World Bank. *Country Creditworthiness* is Institutional Investor's yearly survey-based country credit rating. The value of 100 represents maximum creditworthiness. *Exchange Rate Volatility* is the coefficient of variation of daily exchange rates (US$ to local currency) in a given year. Accounting data and market values are measured as of the fiscal-year end. Except for variables with natural lower or upper bounds, we truncate all variables at the first and 99th percentile.

TABLE 4

Average Bond Yield-to-Maturity Effects of U.S. Equity Cross-Listings

Panel A: Univariate Analysis of Bond Characteristics Surrounding U.S. Equity Cross-Listings

	XLIST vs. Rest of Sample			*Pre- vs. Post-EXCH (+/- 2 years)*		
	Prior to U.S. Cross-Listing	*Following U.S. Cross-Listing*	*P-Value of Difference*	*Prior to U.S. Cross-Listing*	*Following U.S. Cross-Listing*	*P-Value of Difference*
Firm-years	2,272	466		11	43	
Bond yield-to-maturity	3.83%	5.17%	0.000	6.10%	7.20%	0.176
Bond size (US$ million)	160.2	344.2	0.000	590.6	326.5	0.011
Bond maturity (months)	76.5	92.1	0.000	103.9	103.1	0.970
Percent investment grade	35.70%	67.38%	0.000	81.82%	69.77%	0.435
Percent callable	14.70%	21.03%	0.001	9.09%	32.56%	0.126
Percent subordinated	0.40%	1.72%	0.001	0.00%	6.98%	0.377

	Pre- vs. Post-OTC (+/- 2 years)			*Pre- vs. Post-PP (+/- 2 years)*		
	Prior to U.S. Cross-Listing	*Following U.S. Cross-Listing*	*P-Value of Difference*	*Prior to U.S. Cross-Listing*	*Following U.S. Cross-Listing*	*P-Value of Difference*
Firm-years	15	27		4	10	
Bond yield-to-maturity	3.70%	5.83%	0.035	3.91%	7.38%	0.009
Bond size (US$ million)	276.7	257.2	0.735	42.9	177.8	0.104
Bond maturity (months)	78.5	87.3	0.508	51.9	85.0	0.096
Percent investment grade	60.00%	48.15%	0.473	50.00%	60.00%	0.756
Percent callable	13.33%	22.22%	0.494	75.00%	50.00%	0.433
Percent subordinated	n.a.	n.a.		n.a.	n.a.	

(continued)

TABLE 4 — *Continued*

Panel B: OLS Regression Analysis of Bond Yield-to-Maturity and Loan Spreads Surrounding U.S. Equity Cross-Listings

Bond Variables	*Model 1 Bond Yield-to-Maturity*	*Model 2 Bond Yield-to-Maturity*	*Model 3 Bond Yield-to-Maturity*	*Model 4 Bond Yield-to-Maturity*	*Model 5 Syndicated Loan Spreads*	*Loan Variables*
Cross-listing variables:						*Cross-listing variables:*
PP	-0.329	-0.307	-0.335	-0.335	0.137	PP
	(-0.96)	(-0.86)	(-0.99)	(-0.99)	(0.55)	
OTC	-0.337	-0.538**	-0.522**	n.a.	n.a.	OTC
	(-1.55)	(-2.51)	(-2.57)			
EXCH	-0.504**	-0.468**	-0.530***	n.a.	n.a.	EXCH
	(-2.43)	(-2.25)	(-2.65)			
XLIST	n.a.	n.a.	n.a.	-0.527***	0.130	XLIST
				(-2.85)	(0.67)	
Cross-listing firm	0.154	0.269	0.314*	0.314*	-0.044	Cross-listing firm
	(0.89)	(1.49)	(1.79)	(1.80)	(-0.24)	
Bond-specific control variables:						*Loan-specific control variables:*
U.S. T-bill rate	0.189***	0.340***	0.205***	0.205***	0.289***	Log(loan maturity)
	(3.23)	(6.05)	(3.52)	(3.52)	(5.32)	
Local T-bill rate	0.571***	0.545***	0.527***	0.527***	0.151***	Log(loan size)
	(9.69)	(8.26)	(7.88)	(7.88)	(2.86)	
Log(bond maturity)	0.530***	n.a.	0.541***	0.541***	1.073***	Term loans
	(4.78)		(4.79)	(4.79)	(10.29)	
Log(bond size)	0.145***	n.a.	0.181***	0.181***	-0.050***	Log(number of lenders)
	(3.23)		(3.14)	(3.14)	(-9.36)	
Investment grade	-0.391***	n.a.	-0.235***	-0.235***	-0.057	Log(previous loan issues)
	(-4.94)		(-3.13)	(-3.13)	(-0.99)	
Callable	0.502***	n.a.	0.390***	0.390***	-0.166***	Investment grade
	(3.91)		(3.18)	(3.20)	(-2.68)	
Subordinated	1.273**	n.a.	1.072*	1.071*	-0.054	Performance pricing
	(2.26)		(1.83)	(1.83)	(-0.91)	
Previous bond issues	-0.078	n.a.	-0.173***	-0.172***	0.086	Revolver
	(-1.33)		(-2.84)	(-2.84)	(1.09)	
					included	Purpose of loan indicators
Firm-specific and macroeconomic control variables:					*Firm-specific and macroeconomic control variables:*	
Log(total assets)	n.a.	-0.038	-0.082**	-0.083**	-0.050	Log(total assets)
		(-1.24)	(-2.10)	(-2.11)	(-1.55)	
Market-to-book	n.a.	-0.017	-0.025	-0.025	0.006	Market-to-book
		(-0.66)	(-1.08)	(-1.08)	(0.39)	
Leverage	n.a.	2.299***	2.049***	2.050***	0.822***	Leverage
		(6.69)	(6.26)	(6.35)	(2.92)	

(continued)

TABLE 4 — *Continued*

Bond Variables	*Model 1 Bond Yield-to-Maturity*	*Model 2 Bond Yield-to-Maturity*	*Model 3 Bond Yield-to-Maturity*	*Model 4 Bond Yield-to-Maturity*	*Model 5 Syndicated Loan Spreads*	*Loan Variables*
Tangibility	n.a.	-0.094	-0.148	-0.148	-0.286**	Tangibility
		(-0.45)	(-0.73)	(-0.72)	(-2.00)	
Return on assets	n.a.	-3.910***	-3.217***	-3.219***	-1.361***	Return on assets
		(-3.62)	(-2.94)	(-2.94)	(-2.70)	
Inflation	n.a.	0.246***	0.249***	0.249***	0.034	Inflation
		(2.87)	(2.72)	(2.73)	(1.37)	
Log(GDP)	n.a.	1.279	2.158	2.159	0.936	Log(GDP)
		(0.91)	(1.57)	(1.57)	(1.03)	
Country creditworthiness	n.a.	-0.016	-0.028	-0.028	-0.049***	Country creditworthiness
		(-0.77)	(-1.26)	(-1.26)	(-4.03)	
Exchange rate volatility	n.a.	3.245	5.049**	5.055**	n.a.	Exchange rate volatility
		(1.60)	(2.50)	(2.50)		
Country, industry, and year fixed effects	included	included	included	included	included	Country, industry, and year fixed effects
Adj. R^2	73.75%	73.68%	75.12%	75.13%	37.74%	Adj. R^2
N	2,738	2,738	2,738	2,738	2,785	N

The bond yield-to-maturity sample comprises a maximum of 2,738 firm-year observations from 32 countries between 1992 and 2005. In Panel A, we report means for various bond characteristics prior to and following a U.S. equity cross-listing together with the p-values for the statistical significance of the differences. We compare bonds of firms with shares traded in the U.S. over-the-counter markets or listed on a U.S. exchange (*XLIST* = 1) to the rest of the sample, as well as bonds issued in the two years immediately before and after a *PP*, *OTC*, or *EXCH* listing in the U.S. For a description of the bond characteristics see Table 3. In Panel B, we report coefficient estimates and (in parentheses) t-statistics based on robust standard errors clustered by firm from OLS regressions of the costs of debt issuance on firms' cross-listing status and various control variables. In Models 1 to 4, the dependent variable is the *Bond Yield-to-Maturity* measured at the time of the issuance of the bond. For a description of the cross-listing variables, the bond-specific, firm-specific and macroeconomic control variables see Table 3. In Model 5, we use *Syndicated Loan Spreads* as dependent variable, measured as the amount the borrowers pay (including annual fees) over LIBOR for each dollar drawn down. The syndicated loan sample comprises 2,785 firm-year observations from 38 countries between 1992 and 2005 for which sufficient loan-specific data from Dealscan, and Worldscope financial data exist. We exclude financial firms, and require a minimum loan amount of 10 US$ million. We only retain the loan with the largest facility amount per firm-year. In the regression model, we replace the bond characteristics with the following loan-specific control variables (see variable labels on the right of Panel B): *Loan Maturity* is measured in months at the date of the issuance. *Loan Size* equals the facility amount in US$ million. *Term Loans* represents the percentage of individual loans in a loan package (measured using the facility amount) with a specified repayment schedule and a fixed maturity. The *Number of Lenders* is the number of participants in the deal syndicate. *Previous Loan Issues* indicates the number of previous syndicated loans taken by the borrower. *Investment Grade* is an indicator variable equal to 1 if the loan's credit rating is BBB- or higher by Standard & Poor's or Baa3 or higher by Moody's. If credit ratings are missing, we compute Altman's (1968) Z-score, and use 2.675 as cutoff value to assign investment grade status. *Performance Pricing* and *Revolver* are indicator variables set equal to 1 if the loan facility uses performance pricing, or if the loan gets renewed automatically upon maturity. We include three *Purpose of Loan* indicator variables marking the repayment of debt, corporate investments, or working capital needs, but do not report the coefficients. We use log transformations where indicated, and include country, one-digit SIC industry, and year fixed effects in the regressions, but do not report the coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

TABLE 5

Sensitivity Analyses of Bond Yield-to-Maturity Effects of U.S. Equity Cross-Listings

Models	*N*	*Variables*				
		PP	*OTC*	*EXCH*	*XLIST*	*Cross-listing firm*
Panel A: Alternative Dependent Variables						
(1) Bond spreads adjusted for U.S. T-bill rate	2,738	-0.169	-0.449**	-0.486**	n.a.	0.265
		(-0.47)	(-2.14)	(-2.31)		(1.44)
(2) Bond spreads adjusted for local T-bill rate	2,735	-0.322	-0.548***	-0.555***	n.a.	0.330*
		(-1.00)	(-2.60)	(-2.69)		(1.81)
Panel B: Alternative Sample Composition						
(3) Only US$ denominated bonds	383	-0.742	-0.728	-1.215**	n.a.	1.195**
		(-0.84)	(-0.91)	(-1.96)		(2.00)
(4) Only 300 firm-years from Japan	1,469	-0.158	-0.387	-0.430*	n.a.	0.300
		(-0.48)	(-1.55)	(-1.84)		(1.38)
(5) Multiple bond issues per year	5,085	-0.397	-0.516**	-0.384**	n.a.	0.359*
		(-1.26)	(-2.31)	(-2.18)		(1.73)
(6) Including convertible bonds	3,435	0.129	-0.554***	-0.439**	n.a.	0.196
		(0.40)	(-2.62)	(-2.24)		(1.18)
Panel C: Control for Endogeneity of U.S. Cross-Listing						
(7) Selection model for EXCH (including inverse Mills ratio)	2,640	-0.472	-0.601***	-0.538***	n.a.	0.273
		(-1.40)	(-2.93)	(-2.69)		(1.51)
(8) Selection model for XLIST (including inverse Mills ratio)	2,669	-0.374	n.a.	n.a.	-0.568***	0.281
		(-1.09)			(-2.90)	(1.49)
(9) Remove two years following U.S. cross-listing	2,585	-0.372	-0.702***	-0.598**	n.a.	0.277
		(-0.92)	(-3.09)	(-2.56)		(1.40)
(10) Interact cross-listing firm indicator with firm-specific controls	2,738	-0.378	-0.524**	-0.509**	n.a.	0.336
		(-1.01)	(-2.44)	(-2.34)		(1.25)

(continued)

TABLE 5 — *Continued*

The table summarizes various sensitivity analyses of the relation between the costs of debt issuance and firms' cross-listing status. Unless stated otherwise, we estimate the same specification as in Model 3 of Table 4, but only report the coefficient estimates and (in parentheses) t-statistics of the cross-listing variables. We conduct the following sensitivity analyses: (1) we use bond spreads adjusted for U.S. T-bill rates as the dependent variable, i.e., we subtract the contemporaneous yields of U.S. Treasury securities with similar maturity and coupon rates from the bond yield-to-maturity. Consequently, we do not include the *U.S. T-Bill Rate* and *Local T-Bill Rate* variables among the bond-specific controls. (2) Similar to (1), but we adjust the bond yield-to-maturity by the contemporaneous yields of government securities in the issuing firm's country of domicile. If no government securities with similar maturity and coupon rates are available, we use short-term risk-free interest rates instead. (3) We only include bonds denominated in US$. (4) We limit the influence of Japan, the country with the most sample observations, to 300 randomly selected firm-years. (5) We allow for multiple bond issues in a given year. (6) We include convertible bonds in the sample. (7) We include the inverse Mills ratio from a selection model of the U.S. cross-listing decision in the regression. That is, we first model *EXCH* as a function of the percentage of foreign sales (out of total sales revenue), the log of total assets, financial leverage, tangibility, return on assets, a negative earnings indicator, the market-to-book ratio, return variability, Altman's (1968) Z-score, and country and industry fixed effects (see Table 1 for variable descriptions). We then estimate the resulting probit regression separately for each year and compute the corresponding inverse Mills ratios. (8) Similar to (7), but we model *XLIST* in the first stage probit regression. (9) We remove observations from the two years immediately following a U.S. equity cross-listing from the sample. (10) We allow for separate relations between *Bond Yield-to-Maturity* and firm attributes of ADR and non-ADR firms. That is, we include interaction terms between the *Cross-Listing Firm* indicator and each firm-specific control variable in the model. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

TABLE 6

Institutional Characteristics of U.S. Equity Cross-Listing Firms' Countries of Domicile

Country	*Legal Tradition (1=Common Law)*	*Debt Enforcement (1=High Efficiency)*		*Auditing and Reporting Standards (1=Strong)*		*Equity-to-Bond Market (1=Low Importance of Bond Market)*	
Argentina	0	35.8	(0)	3.9	(0)	2.02	(1)
Australia	1	87.8	(1)	6.4	(1)	3.95	(1)
Austria	0	78.0	(1)	6.0	(1)	0.50	(0)
Belgium	0	90.8	(1)	5.9	(1)	0.56	(0)
Brazil	0	13.4	(0)	5.1	(0)	1.13	(0)
Canada	1	93.2	(1)	6.2	(1)	1.30	(0)
Chile	0	40.9	(0)	5.3	(0)	3.28	(1)
China	0	43.6	(0)	3.5	(0)	2.94	(1)
Colombia	0	64.8	(0)	4.6	(0)	1.23	(0)
Denmark	0	76.7	(1)	6.3	(1)	0.96	(0)
Egypt	0	28.6	(0)	4.5	(0)	n.a.	n.a.
Finland	0	92.4	(1)	6.1	(1)	2.77	(1)
France	0	54.1	(0)	6.2	(1)	1.41	(0)
Germany	0	57.0	(0)	6.1	(1)	1.11	(0)
Greece	0	53.8	(0)	4.8	(0)	0.72	(0)
Hong Kong	1	88.3	(1)	6.0	(1)	40.53	(1)
India	1	n.a.	n.a.	5.2	(0)	1.69	(0)
Israel	1	66.2	(1)	6.2	(1)	n.a.	n.a.
Italy	0	45.3	(0)	5.3	(0)	0.48	(0)
Japan	0	95.5	(1)	4.8	(0)	0.96	(0)
Korea (South)	0	88.1	(1)	4.7	(0)	1.98	(1)
Luxembourg	0	n.a.	n.a.	6.1	(1)	n.a.	n.a.
Malaysia	1	48.4	(0)	5.7	(1)	4.27	(1)
Mexico	0	72.6	(1)	4.8	(0)	2.93	(1)
The Netherlands	0	94.9	(1)	6.1	(1)	2.12	(1)
New Zealand	1	90.7	(1)	6.2	(1)	1.56	(0)
Norway	0	91.8	(1)	5.7	(1)	2.07	(1)
Pakistan	1	n.a.	n.a.	5.1	(0)	0.47	(0)
Peru	0	41.8	(0)	4.5	(0)	5.58	(1)
Philippines	0	17.5	(0)	4.7	(0)	1.69	(0)
Poland	0	67.7	(1)	4.7	(0)	0.54	(0)
Portugal	0	82.3	(1)	5.3	(0)	0.82	(0)
Singapore	1	96.1	(1)	6.1	(1)	6.66	(1)
South Africa	1	39.8	(0)	6.0	(1)	3.60	(1)
Spain	0	82.0	(1)	5.3	(0)	1.32	(0)
Sri Lanka	1	45.7	(0)	4.6	(0)	n.a.	n.a.
Sweden	0	86.0	(1)	6.1	(1)	2.12	(1)
Switzerland	0	60.4	(0)	5.8	(1)	7.94	(1)
Taiwan	0	93.8	(1)	5.0	(0)	7.03	(1)
Thailand	1	54.9	(0)	5.1	(0)	4.62	(1)
Turkey	0	6.6	(0)	4.3	(0)	1.29	(0)
United Kingdom	1	92.3	(1)	6.6	(1)	4.27	(1)
Venezuela	0	13.1	(0)	3.9	(0)	0.54	(0)

(continued)

TABLE 6 — *Continued*

The table presents raw values and (in parentheses) dichotomized indicators of the institutional variables used in the propensity analyses to partition the ADR observations into two groups. We use the following country-level partitioning variables: (i) we distinguish between code law vs. common law countries (equal to 1), reflecting countries' *Legal Tradition* (La Porta et al., 1997; Ball, Kothari, and Robin, 2000). (ii) We use the Djankov et al. (2008) *Debt Enforcement* score, measured as the discounted terminal value of a typical firm after bankruptcy costs, and expressed as a percentage of firm value before entry into bankruptcy proceedings. Higher values stand for countries with more efficient debt enforcement. (iii) We measure the quality of a country's *Auditing and Reporting Standards* based on the survey results of the Global Competitiveness Report for the years 2003/04 (source: World Economic Forum). Higher values represent stronger reporting and auditing quality. (iv) We compute the *Equity-to-Bond Market* ratio as the aggregate market capitalization of stocks divided by the aggregate market capitalization of public bonds (source: World Bank). The table reports sample period means. Higher values indicate countries in which bond markets are relatively less important. For our analyses, we transform the continuous variables into binary variables splitting by the sample median.

TABLE 7

Analysis of Public Bond Issues and Domestic or Euro-Bond Issues after U.S. Equity Cross-Listings

Panel A: Probit Regression Analysis of Public Bond Issuance Surrounding U.S. Equity Cross-Listings

	All Firm-Years		XLIST Firm-Years only		
	Model 1	*Model 2*	*Model 3* *Legal Tradition (1=Common Law)*	*Model 4* *Debt Enforcement (1=High Efficiency)*	*Model 5* *Auditing and Reporting Standards (1=Strong)*
Variables					
Cross-listing variables:					
PP	0.119	0.106	0.094	0.048	0.102
	(1.10)	(0.99)	(0.51)	(0.26)	(0.57)
OTC	0.230**	n.a.	n.a.	n.a.	n.a.
	(2.25)				
EXCH	0.257***	n.a.	n.a.	n.a.	n.a.
	(2.69)				
XLIST / XLIST*Partitioning Variable	n.a.	0.234***	-0.183**	0.094	-0.179**
		(2.59)	(-2.17)	(0.97)	(-1.97)
Cross-listing firm	-0.187**	-0.173*	n.a.	n.a.	n.a.
	(-2.09)	(-1.92)			
Firm-specific control variables:					
Loan-issuing firm	0.227***	0.227***	0.285***	0.256***	0.290***
	(6.00)	(6.01)	(3.28)	(2.98)	(3.34)
Equity-issuing firm	0.149***	0.149***	0.322***	0.298***	0.315***
	(4.32)	(4.33)	(4.01)	(3.66)	(3.87)
Log(total assets)	0.381***	0.381***	0.284***	0.304***	0.302***
	(30.17)	(30.20)	(10.27)	(10.93)	(11.14)
Leverage	1.891***	1.888***	2.199***	2.095***	2.165***
	(16.19)	(16.18)	(7.45)	(7.03)	(7.35)
Tangibility	0.007	0.008	0.179	0.110	0.097
	(0.09)	(0.09)	(0.84)	(0.52)	(0.46)
Return on assets	0.305	0.301	0.650	0.469	0.406
	(0.92)	(0.91)	(0.94)	(0.68)	(0.59)
Negative earnings	-0.097*	-0.096*	-0.192	-0.210	-0.195
	(-1.73)	(-1.72)	(-1.44)	(-1.62)	(-1.46)
Funding needs	0.330	0.330	0.270	0.101	0.204
	(1.30)	(1.30)	(0.42)	(0.16)	(0.32)
Market-to-book	0.001	0.001	0.016	0.012	0.018
	(0.09)	(0.10)	(1.27)	(0.98)	(1.48)
Return variability	-1.194***	-1.187***	-0.640	-0.369	-0.677
	(-3.96)	(-3.94)	(-1.09)	(-0.63)	(-1.14)
Log(GDP)	n.a.	n.a.	0.129***	0.119***	0.103**
			(3.31)	(2.91)	(2.48)
Country fixed effects	included	included	n.a.	n.a.	n.a.
Industry and year fixed effects	included	included	included	included	included
Pseudo R^2	38.27%	38.26%	24.88%	24.70%	24.85%
N	110,311	110,311	7,543	7,468	7,543

(continued)

TABLE 7 — *Continued*

Panel B: Probit Regression Analysis of Domestic or Euro-Bond Issuance Surrounding U.S. Equity Cross-Listings

	All Firm-Years		XLIST Firm-Years only		
	Model 1	*Model 2*	*Model 3* *Legal Tradition (1=Common Law)*	*Model 4* *Debt Enforcement (1=High Efficiency)*	*Model 5* *Auditing and Reporting Standards (1=Strong)*
Variables					
Cross-listing variables:					
PP	0.133	0.138	0.022	-0.036	0.039
	(1.45)	(1.52)	(0.13)	(-0.21)	(0.23)
OTC	0.150*	n.a.	n.a.	n.a.	n.a.
	(1.75)				
EXCH	0.100	n.a.	n.a.	n.a.	n.a.
	(1.19)				
XLIST / XLIST*Partitioning Variable	n.a.	0.121	-0.341***	-0.147*	-0.241***
		(1.57)	(-4.01)	(-1.69)	(-2.67)
Cross-listing firm	-0.111	-0.112	n.a.	n.a.	n.a.
	(-1.50)	(-1.49)			
Firm-specific control variables:					
Loan-issuing firm	0.242***	0.242***	0.235***	0.182**	0.228***
	(8.04)	(8.03)	(2.83)	(2.23)	(2.80)
Equity-issuing firm	0.195***	0.195***	0.325***	0.308***	0.302***
	(7.11)	(7.11)	(4.16)	(3.83)	(3.74)
Log(total assets)	0.312***	0.312***	0.271***	0.294***	0.303***
	(30.79)	(30.75)	(9.83)	(10.78)	(11.22)
Leverage	1.767***	1.771***	1.941***	1.890***	1.860***
	(19.03)	(19.07)	(7.05)	(6.79)	(6.78)
Tangibility	-0.033	-0.034	-0.034	-0.107	-0.172
	(-0.45)	(-0.47)	(-0.16)	(-0.51)	(-0.81)
Return on assets	-0.331	-0.332	0.269	0.089	-0.063
	(-1.29)	(-1.29)	(0.38)	(0.13)	(-0.09)
Negative earnings	-0.066	-0.067	-0.085	-0.123	-0.094
	(-1.56)	(-1.59)	(-0.65)	(-0.95)	(-0.72)
Funding needs	0.834***	0.836***	0.776	0.627	0.642
	(4.96)	(4.97)	(1.49)	(1.19)	(1.27)
Market-to-book	0.022***	0.022***	0.027***	0.025**	0.029***
	(4.62)	(4.58)	(2.59)	(2.31)	(2.77)
Return variability	-0.480**	-0.483**	-0.040	0.163	-0.008
	(-2.38)	(-2.39)	(-0.08)	(0.32)	(-0.02)
Log(GDP)	n.a.	n.a.	0.087**	0.088**	0.053
			(2.26)	(2.16)	(1.30)
Country fixed effects	included	included	n.a.	n.a.	n.a.
Industry and year fixed effects	included	included	included	included	included
Pseudo R^2	31.48%	31.47%	24.42%	23.71%	23.94%
N	110,633	110,633	7,543	7,468	7,543

(continued)

TABLE 7 — *Continued*

Panel C: OLS Regression Analysis of Public Bond, Private Bond, and Domestic or Euro-Bond Yield-to-Maturity after U.S. Equity Cross-Listings

Variables	*Model 1 Public Bonds*	*Model 2 Private Bonds*	*Model 3 Domestic Bonds & Eurobonds*
Cross-listing variables:			
PP	-0.601	0.239	-0.395
	(-1.34)	(0.30)	(-1.15)
XLIST	-0.396**	-0.719	-0.481***
	(-2.04)	(-0.90)	(-2.86)
Cross-listing firm	0.262	0.168	0.253*
	(1.43)	(0.23)	(1.68)
Bond-specific control variables:			
U.S. T-bill rate	0.223***	0.338***	0.199***
	(3.80)	(2.60)	(3.34)
Local T-bill rate	0.489***	0.517***	0.560***
	(5.99)	(4.22)	(7.86)
Log(bond maturity)	0.362***	1.511***	0.542***
	(2.96)	(5.22)	(4.60)
Log(bond size)	0.107*	0.117	0.141**
	(1.71)	(0.97)	(2.35)
Investment grade	-0.032	-0.494***	-0.145*
	(-0.43)	(-3.02)	(-1.90)
Callable	0.618***	0.093	0.230
	(4.37)	(0.57)	(1.61)
Subordinated	2.337**	0.826*	1.714**
	(2.56)	(1.89)	(2.54)
Previous bond issues	-0.157***	-0.049	-0.105*
	(-2.64)	(-0.31)	(-1.67)
Firm-specific and macroeconomic control variables:			
Log(total assets)	-0.103***	-0.189**	-0.053
	(-2.58)	(-2.25)	(-1.30)
Market-to-book	-0.026	0.058	-0.010
	(-1.09)	(0.97)	(-0.42)
Leverage	1.723***	2.727***	1.503***
	(5.42)	(3.75)	(4.62)
Tangibility	-0.171	0.247	0.012
	(-0.82)	(0.54)	(0.05)
Return on assets	-2.584**	-3.818*	-3.689***
	(-2.24)	(-1.84)	(-3.09)
Inflation	0.230**	0.411***	0.263**
	(2.15)	(3.16)	(2.52)
Log(GDP)	-0.051	5.426***	2.146
	(-0.03)	(2.73)	(1.38)
Country creditworthiness	-0.006	-0.134***	-0.023
	(-0.20)	(-3.70)	(-0.91)
Exchange rate volatility	8.010***	-7.549	6.937***
	(3.73)	(-0.98)	(3.33)
Country, industry, and year fixed effects	included	included	included
Adj. R^2	80.08%	76.56%	73.83%
N	2,141	550	2,580

(continued)

TABLE 7 — *Continued*

The table presents propensity and yield-to-maturity analyses for the subset of bonds issued in a public market offering (*Public Bonds*), and bonds issued in the firms' country of domicile (*Domestic Bonds*), or abroad but not in the U.S. (*Eurobonds*). In Panel A (Panel B), we report coefficient estimates and (in parentheses) z-statistics from the same probit regression specification as in Model 1 of Table 2, but use *Public Bonds* (*Domestic Bonds* combined with *Eurobonds*) as dependent variable. For a description of the cross-listing variables and the firm-specific control variables see Table 1. Models 1 and 2 use the full sample with all Worldscope observations, and either separately estimate the coefficients for the three cross-listing types (*PP*, *OTC*, *EXCH*) or combine the latter two into *XLIST*. In Models 3 to 5, we limit the sample to firms with shares traded in the U.S. over-the-counter markets or listed on a U.S. exchange (*XLIST* = 1). We then classify the XLIST observations into two distinct categories using the following binary country-level partitioning variables: (i) *Legal Tradition*, (ii) the efficiency of the *Debt Enforcement* procedures, and (iii) the quality of the *Auditing and Reporting Standards* (see Table 6 for details). Because we cannot estimate country fixed effects in these models, we include the natural log of countries' annual gross domestic product *GDP* (in constant US$) among the firm-specific control variables. In Panel C, we report coefficient estimates and (in parentheses) t-statistics from the same OLS regression specification as in Model 4 of Table 4, but limit the analyses to *Public Bonds* (Model 1), privately placed bonds (Model 2), and *Domestic Bonds* or *Eurobonds* (Model 3). For a description of the cross-listing variables, the bond-specific, firm-specific and macroeconomic control variables see Table 3. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

TABLE 8

Analysis of Yankee Bond Issues after U.S. Equity Cross-Listings

Panel A: Probit Regression Analysis of Yankee Bond Issuance Surrounding U.S. Equity Cross-Listings

	All Firm-Years		XLIST Firm-Years only		
	Model 1	*Model 2*	*Model 3* *Legal Tradition (1=Common Law)*	*Model 4* *Debt Enforcement (1=High Efficiency)*	*Model 5* *Equity-to-Bond Market (1=Low Importance of Bond Market)*
Variables					
Cross-listing variables:					
PP	0.214	0.118	0.191	0.201	0.165
	(1.60)	(0.95)	(1.10)	(1.13)	(0.94)
OTC	-0.166	n.a.	n.a.	n.a.	n.a.
	(-1.21)				
EXCH	0.459***	n.a.	n.a.	n.a.	n.a.
	(3.70)				
XLIST / XLIST*Partitioning Variable	n.a.	0.244**	0.153	0.452***	-0.091
		(2.21)	(1.43)	(2.99)	(-0.89)
Cross-listing firm	0.119	0.178	n.a.	n.a.	n.a.
	(1.00)	(1.61)			
Firm-specific control variables:					
Loan-issuing firm	0.295***	0.291***	0.358***	0.352***	0.355***
	(5.00)	(4.96)	(3.17)	(3.02)	(3.14)
Equity-issuing firm	0.204***	0.220***	0.331***	0.323***	0.352***
	(3.72)	(4.01)	(3.24)	(3.11)	(3.43)
Log(total assets)	0.256***	0.266***	0.147***	0.156***	0.137***
	(12.40)	(13.02)	(4.81)	(5.22)	(4.68)
Leverage	1.690***	1.640***	1.636***	1.546***	1.645***
	(10.01)	(9.76)	(5.70)	(5.29)	(5.73)
Tangibility	-0.268**	-0.244*	0.333	0.338	0.350
	(-2.06)	(-1.87)	(1.30)	(1.30)	(1.37)
Return on assets	0.764	0.811	0.752	0.874	0.902
	(1.44)	(1.52)	(0.87)	(1.00)	(1.05)
Negative earnings	0.054	0.078	0.038	0.057	0.054
	(0.61)	(0.88)	(0.23)	(0.34)	(0.32)
Funding needs	0.447	0.460	-0.466	-0.416	-0.312
	(1.34)	(1.36)	(-0.62)	(-0.54)	(-0.41)
Market-to-book	0.035***	0.037***	0.007	0.003	0.009
	(4.81)	(5.25)	(0.47)	(0.20)	(0.68)
Return variability	0.728**	0.768**	1.080*	1.247*	1.001
	(2.20)	(2.34)	(1.70)	(1.94)	(1.58)
Log(GDP)	n.a.	n.a.	-0.004	-0.027	-0.024
			(-0.10)	(-0.71)	(-0.57)
Country fixed effects	included	included	n.a.	n.a.	n.a.
Industry and year fixed effects	included	included	included	included	included
Pseudo R^2	36.87%	36.21%	16.61%	17.68%	16.39%
N	103,662	103,662	7,543	7,468	7,417

(continued)

TABLE 8 — *Continued*

Panel B: OLS Regression Analysis of Yankee Bond Yield-to-Maturity after U.S. Equity Cross-Listings

Variables (N=2,738)	*Model 1*	*Model 2*
Cross-listing variables:		
PP	-0.326	-0.326
	(-0.97)	(-0.97)
OTC	-0.507**	n.a.
	(-2.50)	
OTC*Yankee bond	0.173	n.a.
	(0.46)	
EXCH	-0.456**	n.a.
	(-2.23)	
EXCH*Yankee bond	-0.523*	n.a.
	(-1.71)	
XLIST	n.a.	-0.476***
		(-2.58)
XLIST*Yankee bond	n.a.	-0.489
		(-1.64)
Cross-listing firm	0.307*	0.305*
	(1.78)	(1.77)
Yankee bond	0.483*	0.480*
	(1.91)	(1.91)
Bond-specific control variables:		
U.S. T-bill rate	0.203***	0.203***
	(3.48)	(3.49)
Local T-bill rate	0.532***	0.532***
	(7.92)	(7.92)
Log(bond maturity)	0.541***	0.541***
	(4.78)	(4.78)
Log(bond size)	0.169***	0.169***
	(2.91)	(2.92)
Investment grade	-0.241***	-0.241***
	(-3.20)	(-3.20)
Callable	0.362***	0.365***
	(2.83)	(2.86)
Subordinated	1.104*	1.105*
	(1.87)	(1.88)
Previous bond issues	-0.169***	-0.169***
	(-2.77)	(-2.78)
Firm-specific and macroeconomic control variables:		
Log(total assets)	-0.082**	-0.082**
	(-2.09)	(-2.09)
Market-to-book	-0.024	-0.024
	(-1.02)	(-1.01)
Leverage	2.016***	2.011***
	(6.22)	(6.29)
Tangibility	-0.133	-0.136
	(-0.65)	(-0.66)
Return on assets	-3.193***	-3.160***
	(-2.89)	(-2.87)
Inflation	0.251***	0.251***
	(2.74)	(2.74)

(continued)

TABLE 8 — *Continued*

Variables	*Model 1*	*Model 2*
Log(GDP)	2.323*	2.334*
	(1.70)	(1.71)
Country creditworthiness	-0.027	-0.027
	(-1.22)	(-1.22)
Exchange rate volatility	5.745***	5.698***
	(2.75)	(2.73)
Country, industry, and year fixed effects	included	included
Adj. R^2	75.16%	75.17%

The table presents propensity and yield-to-maturity analyses for the subset of bonds issued in the U.S. (*Yankee Bonds*). In Panel A, we report coefficient estimates and (in parentheses) z-statistics from the same probit regression specification as in Model 1 of Table 2, but use *Yankee Bonds* as dependent variable. For a description of the cross-listing variables and the firm-specific control variables see Table 1. Models 1 and 2 use the full sample with all Worldscope observations, and either separately estimate the coefficients for the three cross-listing types (*PP*, *OTC*, *EXCH*) or combine the latter two into *XLIST*. In Models 3 to 5, we limit the sample to firms with shares traded in the U.S. over-the-counter markets or listed on a U.S. exchange (*XLIST* = 1). We then classify the XLIST observations into two distinct categories using the following binary country-level partitioning variables: (i) *Legal Tradition*, (ii) the efficiency of the *Debt Enforcement* procedures, and (iii) the ratio of *Equity-to-Bond Market* capitalization (see Table 6 for details). Because we cannot estimate country fixed effects in these models, we include the natural log of countries' annual gross domestic product *GDP* (in constant US$) among the firm-specific control variables. In Panel B, we report coefficient estimates and (in parentheses) t-statistics from the same OLS regression specification as in Model 4 of Table 4, but include a separate main effect for *Yankee Bonds* and interact this variable with the cross-listing variables (i.e., *OTC* and *EXCH* in Model 1; *XLIST* in Model 2). For a description of the cross-listing variables, the bond-specific, firm-specific and macroeconomic control variables see Table 3. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.