Equity cross-listings in the U.S. and the price of debt

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Abstract Using a large panel from 46 countries over 20 years, we find that non-U.S. firms issue corporate bonds more frequently and at lower offering yields following an equity cross-listing on a U.S. exchange. Firms issue more bonds through public offerings instead of private placements and in foreign markets rather than at home, in both cases at significantly lower yields. Moreover, the debt-related benefits are concentrated among firms domiciled in countries with less private benefits of control, efficient debt enforcement, and developed bond markets, suggesting that equity cross-listings cannot completely offset the impact of weak home country institutions. The results support the notion that the monitoring, transparency, and visibility benefits brought about by equity cross-listings on U.S. exchanges are valuable to bond investors.

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

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1 Introduction

Does cross-listing equity shares in the United States facilitate non-U.S. firms' access to more and cheaper bond financing? While debt markets have traditionally been the main source of external capital (e.g., Rajan and Zingales 1995; Henderson et al. 2006), extant literature focused on the costs and benefits of equity cross-listing from a shareholders' perspective (Karolyi 1998, 2006). The argument goes that firms domiciled in countries with weak minority shareholder protection, 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 equity effects are important and ultimately serve to justify a firm's cross-listing decision, there is only limited evidence on the bond market implications of U.S. equity cross-listings (e.g., Miller and Puthenpurackal 2002; Lins et al. 2005; Qi et al. 2010).[2]

The equity benefits of cross-listings draw on the comparative advantages of both the deep and liquid U.S. capital markets and the U.S. judicial system with its more transparent disclosures, investor protection, and effective monitoring. These characteristics, in principle, should also benefit the bondholders of the firm as they likely facilitate access to secondary bond markets with higher liquidity and better information, increase the transparency of the firm, and allow for better monitoring and enforcement of bond contracts. In return, investors should be more willing to participate in the bond issues of cross-listed firms and reduce their price

1 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 et al. 2004), reduce the cost of equity capital (e.g., Errunza and Miller 2000; Hail and Leuz 2009), improve liquidity (e.g., Baruch et al. 2007) and the information environment (e.g., Lang et al. 2003), and expand their investor base (e.g., Ammer et al. 2012; 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 (OTC) markets (the OTC Bulletin Board and Pink Sheets), or a private placement under Rule 144A.

protection against credit risk, thereby lowering the borrowing costs of these firms (Hart 1995).

However, the realization of bond financing 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 likely 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). 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, debt-related benefits from equity cross-listings likely vary across different types of debt. For public bond offerings, which are arm's length transactions, or bond offerings outside the firm's home market, lenders might rely more on country-level governance institutions for protection, enforcement, and disclosure (Bharath et al. 2008; Florou and Kosi 2015), and hence should obtain higher benefits from the certification role of U.S. equity cross-listings. In contrast, because lenders in private bond placements or in the firm's home market might have privileged access to information, they have incentives to closely monitor the borrower because of their greater exposure and to use multiple debt contractual levers (not just interest rates) to protect the value of their claims (Gigler et al. 2009).

To examine these issues, we construct a large international panel comprising of more than 24,000 non-U.S. firms from 46 countries over the years 1992 to 2012. About 11 percent of the yearly observations are from firms with a U.S. equity cross-listing and 19 percent from firms that issue bonds. We begin with an analysis of the impact of equity cross-listings on firms' use

of bond markets and the financing costs of issuing bonds. We find that non-U.S. firms are more likely to issue bonds after cross-listing their equity on a U.S. stock exchange (NYSE, Nasdaq, and Amex). The propensity to issue bonds increases by about 75 basis points. At the same time, the bond offering yields are, on average, *lower* by 38 basis points compared to the period before the exchange cross-listing and the benchmark sample of firms without a U.S. cross-listing. This estimate translates into yearly cost savings on the order of US$ 1 million per firm, based on the mean bond size of US$ 252 million. The results are present both in the period before and, to a lesser degree, after the Sarbanes-Oxley Act (SOX) of 2002, which arguably has shifted the cost-benefit tradeoffs faced by firms when deciding to cross-list their equity in the U.S. (Doidge et al. 2009; 2010). Firms with U.S. private equity placements or trading in the OTC markets also exhibit higher propensities to issue bonds, but only in certain comparisons, and with limited, if any, benefits in the form of lower issuing yields. The results are robust to controlling for a large set of bond characteristics, firm attributes, macroeconomic factors, country, industry, and year fixed effects, as well as the endogenous nature of the firms' cross-listing decision.

Next, we explore factors that help explain why bond markets become more attractive after equity cross-listings. We show that firms with a U.S. exchange-listing start issuing more public bonds and bonds outside their home market, and do so at lower offering yields. The propensity to issue public (foreign) bonds increases by about 70 (189) basis points, and the average yield decreases by 41 (53) basis points. At the same time, we do not find changes in the issuance activity of private bonds, nor their offering yields, while there is evidence of fewer bonds issued domestically (at slightly lower yields). The findings suggest that the information environment of the firm and/or the lenders' monitoring capabilities improve after a U.S. equity cross-listing (e.g., Lang et al. 2003), and that these changes primarily benefit bondholders typically facing higher agency problems (i.e., without inside access to the firm or in foreign markets). The

benefits are concentrated for exchange-listings relative to OTC listings or private placements, consistent with the notion that listing on a U.S. exchange offers, by far, the strongest improvements in terms of transparency and monitoring. We find no evidence of changes in the equity market and only a slight increase in the issuing activity (but not the spreads) of syndicated loans.

Finally, we examine how the bond-market benefits of U.S. equity cross-listings vary by characteristics of the firm's country of domicile. The bonding hypothesis stipulates that equity investors in firms from countries with weak institutions should benefit the most from a U.S. exchange listing (e.g., Doidge et al. 2004; Hail and Leuz 2009). Contrary to this argument, we find that firms domiciled in countries with small private benefits of control issue more bonds at lower yields after U.S. exchange listings. The results suggest that strengthening the position of shareholders does not necessarily improve the position of the debt holders (Qi et al. 2011). They also point to the existence of liquidity and visibility benefits in the bond market that go along with a U.S. exchange cross-listing (e.g., Foerster and Karolyi 1999; Reese and Weisbach 2002; Qi et al. 2010). We further find a higher bond issuing activity at lower offering yields for firms domiciled in countries with a track record of efficient debt enforcement and more developed bond markets (measured as percentage of GDP). In sum, these results underscore the importance of local institutions, namely those that protect creditors' rights, for the certification role of U.S. equity cross-listings in the bond market.

Our study contributes to the literature in several ways. First, our focus is the effect of an equity cross-listing on a U.S. stock exchange on non-U.S. firms' bond issuance activity. The comprehensive sample allows us to provide evidence on the incidence and location of bond offerings, the types of bonds issued, and the ensuing issuance costs for firms from more than 40 countries over a period of 20 years. Most prior literature has focused on a specific aspect of the

ADR market, like the offering yields of Yankee bonds issued by firms with U.S. equity cross-listings (Miller and Puthenpurackal 2002), the issuance of equity instead of debt (Reese and Weisbach 2002), or the use of cross-listings to relax capital constraints and improve the overall cash flow sensitivity (Lins et al. 2005). Khurana et al. (2008) investigate whether cross-listed firms' improved access to external funds contributes to higher growth prospects. They document more debt issues, but do not distinguish between the type of debt, the domicile of the issuer (or the issue), and do not control for debt characteristics. Our evidence that equity cross-listings are related to more public bond offerings in markets outside the firm's country of domicile and lower offering yields adds to this stream of literature and complements the findings on the equity-market benefits of U.S. cross-listings.

Second, we contribute to the literature on factors that mitigate agency conflicts between firms and their bondholders. We show that the improved firm transparency and/or the better monitoring capabilities that go along with an equity cross-listing on a U.S. exchange, but not with an OTC listing or a private placement, help reduce information asymmetries. They do so primarily for bond contracts that do not allow for private monitoring and information collection and for bond investors who are not familiar with local circumstances. These findings are in line with Bharath et al. (2008) or Florou and Kosi (2015) that show firms' preference for public over private debt when accounting quality improves. The finding of more bonds issued abroad at lower cost is also consistent with U.S. equity cross-listings improving the visibility of the firm (Merton 1987), not just in the equity market, but also in the bond market.

Third, we contribute to the literature on the cross-country determinants of debt contracting (e.g., Francis et al. 2005; Qi et al. 2010; Fan et al. 2012). We find that the debt-market benefits of U.S. equity cross-listings are concentrated in countries with developed debt markets, efficient debt enforcement, and low private benefits of controlling insiders. The results indicate that

bonding to U.S. market regulation and oversight (e.g., Coffee 1999; Stulz 1999) cannot completely offset the impact of weak home-country institutions when it comes to debt financing. This finding is consistent with the fact that the physical location of firms' assets and the legal procedures in case of default play a preeminent role for bondholders, in line with Qian and Strahan (2007)'s results for syndicated loans.

Section 2 contains the hypothesis development. In Section 3, we discuss the research design and describe the sample. Section 4 presents the main analysis on the changes to the propensity and the cost of issuing bonds following a U.S. equity cross-listing. In Section 5, we distinguish between different types of bonds and vary the analyses conditional on the issuing firm's country of domicile. Section 6 concludes.

2 Hypothesis development

The main theories underlying the equity cross-listing decision are the bonding and information hypothesis (Stulz 1999; Coffee 1999, 2002) as well as the liquidity and visibility hypothesis (Stulz 1981; Merton 1987).[3] The bonding and information hypothesis proposes that firms cross-list equity in the U.S. to credibly signal their commitment to protect minority interests and 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 increase their visibility among U.S. investors.[4]

3 Empirical work in the equity market provides support for both theories (e.g., Doidge et al. 2004; King and Segal 2009).

4 In both cases, access to external (equity or debt) capital is a primary motivation for cross-listing. In line with this argument, Pagano et al. (2002) show that U.S. exchanges are attractive for (European) high-tech and export-oriented companies that use the equity cross-listing to fund their growth and foreign sales expansion.

The bonding and information argument should also apply to bond financing. Stringent disclosure and listing requirements for foreign registrants decrease bond investors' information acquisition and monitoring costs. They lower information asymmetries before investing, and allow corporate outsiders to detect credit problems in a timelier manner during the holding period. For instance, through the Form 20-F filing provisions that apply to an exchange-listing (but not a listing in the OTC markets or a private equity placement) bond investors gain access to details about prior and existing bonds and syndicated loan contracts. Moreover, equity cross-listings allow bondholders 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). A cross-listing in the U.S. likely increases the scrutiny from market participants, financial intermediaries, and regulators. Intermediaries that have significant reputational capital at stake (e.g., international audit firms, rating agencies, or underwriters) will put more pressure on managers and controlling shareholders, thereby limiting their ability to expropriate resources from bondholders though actions like overinvestment, fraud, or strategic defaults. Overall, a credible commitment to more transparency and market scrutiny stemming from an equity exchange-listing in the U.S. should facilitate access to bond markets and reduce credit risk premiums required by bond investors (Hart 1995).

The liquidity and visibility argument yields similar predictions. Compared to international markets, the liquidity of the U.S. market for corporate bonds is significantly higher, mainly due to the existence of large and competitive underwriters, sophisticated debt investors, powerful information intermediaries, and low transaction costs. Higher liquidity, in turn, lowers the cost of debt (e.g., Chen et al. 2007). In addition, having shares traded in the U.S. helps non-U.S. borrowers overcome investors' lack of familiarity and potentially attracts a larger set of foreign investors (Merton 1987). These forces should increase the demand for bonds from firms with

U.S. equity cross-listings and allow them to raise debt capital at lower rates.[5]

However, the ability to raise more and cheaper capital through bond issues after a U.S. equity cross-listing is far from certain. First, U.S. regulations and creditor protection rules explicitly only apply to bonds registered with the SEC (i.e., Yankee bonds), and even SEC registrations do not completely substitute for home-country institutions.[6] In all other cases, the quality of debt enforcement and the creditor protection in the issuing firm's home country likely continues to shape the availability, structure, and terms of the bond contracts (La Porta et al. 1997; Qian and Strahan 2007). Also, the physical location of assets used as collateral determines bondholders' ability to enforce and recover claims. Hence, bondholders might accept lower risk premiums only from firms located in countries that protect creditor rights (e.g., Licht 2003; Siegel 2005).

Second, equity 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 growth opportunities (Doidge et al. 2004; Hail and Leuz 2009), managers might be tempted to make investments that maximize shareholders' wealth rather than total firm value. For instance, firms might avoid safe positive net present value projects in favor of risky, but negative net present value projects such as takeovers.[7] The ensuing increase in debt-related agency costs might lead to a lower likelihood of issuing bonds and higher risk premiums.

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

6 Miller and Puthenpurackal (2002) and Miller and Reisel (2012) show that investors in Yankee bonds (i.e., bonds issued in the U.S. by foreign firms) require higher yield spreads and impose more restrictive debt covenants if the issuing firm is from a country with weak creditor rights protection.

7 Leverage often increases after takeovers (Kim and McConnell 1977; Ghosh and Jain 2000). Higher leverage reduces the value of existing debt by increasing the probability and deadweight costs of a possible future bankruptcy and by reordering the priority of claims in the case of default (e.g., issuance of more senior debt).

Finally, the stipulated benefits likely depend on the type of debt issued. Public bond investors are at arm's length. They exercise limited control over the decisions of borrowers, do not take on an active monitoring role, and mainly rely on publicly available information. Due to the inherent free-rider problem they face, bondholders rarely renegotiate the bond contract if credit problems arise (e.g., Diamond 1984, 1991). Thus, they should benefit from better information, monitoring, and visibility that goes along with a U.S. exchange-listing. On the other hand, the difference between home country institutions and the U.S. regulatory system is less likely to affect the issuance and yields of privately placed bonds and bank debt given that these lenders already engage in active monitoring and rely on private access to borrower information. Private bond placements typically involve only a small group of sophisticated investors and have more restrictive covenants than public bonds (e.g., Kwan and Carleton 2010). Banks can more effectively monitor their loan portfolio as they often have existing relationships with the borrowing firm, and because of their privileged access to information, they can include extensive protection features in the lending contracts (e.g., performance pricing, covenants, seniority, etc.).[8] Thus, the information and monitoring benefits from U.S. equity cross-listings are less obvious for these types of debt securities.

3 Research design and sample description

3.1 Propensity of bond financing analyses

To empirically test the debt-related benefits of U.S. equity cross-listings we first examine changes in the propensity of issuing corporate bonds. We estimate the following probit model:

[8] Consistent with bank lenders being better able to mitigate agency issues than public debt holders, Harvey et al. (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.

$$\textit{Bond issue}_{i,t} = \beta_0 + \beta_{1a}PP_{i,t} + \beta_{1b}OTC_{i,t} + \beta_{1c}EXCH_{i,t} + \beta_2\textit{Cross-listing firm}_i + \sum\beta_j\textit{Debt and equity financing, firm-specific controls}_{i,t} + \sum\beta_k\textit{Fixed effects}_{i,t} + \varepsilon_{i,t}. \quad (1)$$

The dependent variable is a binary indicator that takes on the value of '1' if a firm issues a fixed-rate corporate bond in a year, either publicly or via private placements, and '0' otherwise. The primary test variable is a non-U.S. firm's cross-listing status of its equity shares. We construct three binary indicator variables that take on the value of '1' in years in which the firm has (i) an exchange-listing on NYSE, Nasdaq, or Amex (*EXCH*), (ii) an over-the-counter listing in the Pink Sheets or the OTC Bulletin Board (*OTC*), and (iii) a private placement under Rule 144A (*PP*). The distinction reflects different enforcement and disclosure consequences. Before 2007, foreign firms with a U.S. exchange-listing had to file Form 20-F with the SEC, requiring extensive disclosures and a reconciliation of foreign financial statements to U.S. GAAP.[9] After November 15, 2007, the SEC eased this requirement for firms reporting under International Financial Reporting Standards. Exchange-listed firms are subject to SEC enforcement and can face legal liabilities from shareholder litigation. In contrast, OTC listings do not require extensive disclosures or 20-F filings but a registration statement using Form F-6 and home-country disclosures. They are 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 additional disclosures.

Cross-listing represents a voluntary choice on the part of the firm. To address this potential self-selection issue, we include a *Cross-listing firm* indicator equal to '1' if the firm has an ADR outstanding during the sample period. This variable controls for time-invariant firm attributes associated with the cross-listing decision. In the spirit of a difference-in-differences analysis,

9 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.

the variable allows us to identify the cross-listing effect from comparing the post-cross-listing years to the pre-cross-listing years of the same firms as well as the other firms that never cross list.[10] We further include separate indicators (*Previous bond issue*, *Loan-issuing firm*, and *Equity-issuing firm*) to control for the presence of alternative sources of external funding. Firms that have just come off another bond issuance within the last two years, or are able to access alternative sources of external funding, typically have a better standing among (prospective) bond investors.

Next, we include several firm attributes shown to be related to bond offerings. Firm size, measured as *Market value* in US$ million, is a proxy for information asymmetry between firms and investors. Larger firms should obtain more favorable financing terms. *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 year, and '0' otherwise. Loss firms are expected to face more scrutiny from investors. We measure *Funding needs* as net cash flows from operations divided by total assets (multiplied by -1). Higher values stand for greater external funding needs. *Market-to-book* is the ratio of market value of equity to book value of equity. Firms with valuable growth options (high market-to-book ratios) need more financing but they

10 In a related study, Boubakri et al. (2013) examine factors that influence the propensity of issuing debt (and equity) in the first year after a U.S. equity cross-listing. They exclusively focus on a sample of ADR firms and, hence, the insights are limited to the incremental changes in the propensity of issuing debt *given* the firm is already cross-listed. In contrast, we utilize a panel that includes all observations pre and post cross-listing as well as non-cross-listed firms. This design lets us speak directly to the incremental effects of cross-listing on the propensity of issuing debt (relative to the pre-period and the non-cross-listed firms).

also might be riskier. *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 in the model.

Data on corporate bond offerings are from Thompson Deals, complemented by the Mergent Fixed Income Securities Database (FISD). We distinguish between bonds issued in public offerings as opposed to private placements (*Public bonds*), the firm's country of domicile (*Domestic bonds*), or abroad (*Foreign bonds*). We collect syndicated loans from Dealscan and data on equity offerings from the SDC Platinum database. We determine a firm's cross-listing status at any point during the sample period based on ADR data gathered from Citibank, JP Morgan, Bank of New York, Datastream, and Bloomberg (see Hail and Leuz 2009, for details on the data collection and coding). We use this information to construct a comprehensive panel of firms' debt and equity financing behavior and their U.S. cross-listing status in a year.

Table 1 provides an overview of the sample composition by country (Panel A) and year (Panel B). We manually match the external financing and cross-listing panel to the Worldscope universe (except for U.S. firms).[11] We exclude financial firms (one-digit SIC code equal to 6), firms with market values below US$ 10 million, and require each sample country to comprise at least 30 unique firms and one ADR. The sample comprises 195,999 firm-years from 46 countries over the years 1992 to 2012. About 11 percent of the yearly observations are from firms with a U.S. equity cross-listing (2.9 percent represent *EXCH* years) and 19 percent from firms that issue bonds (3.2 percent are *Bond issue* years). Except for maybe Japan, which comprises 20 percent of the sample (30 percent of the *Bond issue* years), no single country plays

[11] 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. This procedure does not allow us to identify debt and equity offerings by subsidiaries if they are incorporated under a different name, domiciled in a different country, or belong to a different industry than their parent company.

a dominant role in terms of external financing or U.S. cross-listing.[12] The yearly data in Panel B show that U.S. exchange-listings peak around the introduction of SOX in 2002. The depressed bond and loan financing activity around the global financial crisis in 2007/2008 is also apparent. Panel A of Table 2 presents descriptive statistics for the variables used to estimate Eq. (1), together with further details on the variable measurement in the table caption.

3.2 Bond yield-to-maturity analyses

The second test examines whether U.S. equity cross-listings are associated with lower bond offering yields. We estimate the following ordinary least squares (OLS) regression:

$$\textit{Bond yield-to-maturity}_{i,t} = \gamma_0 + \gamma_{1a}PP_{i,t} + \gamma_{1b}OTC_{i,t} + \gamma_{1c}EXCH_{i,t} + \gamma_2\textit{Cross-listing firm}_i + \sum\gamma_j\textit{Bond-specific, firm-specific \& macroeconomic controls}_{i,t} + \sum\gamma_k\textit{Fixed effects}_{i,t} + \sigma_{i,t}. \quad (2)$$

The dependent variable, *Bond yield-to-maturity*, is the offering yield of the bond at the time of the issuance (in percent). We use the same three cross-listing types, *PP*, *OTC*, and *EXCH*, as the test variables, and again include the *Cross-listing firm* indicator. Because yield-to-maturity is likely affected by the expected real interest rates in the country of domicile and investors' time preferences for money, 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.

Other bond characteristics are included as control variables. *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 risk of default, yet are more actively traded thereby

12 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).

lowering the liquidity premium. The binary indicator *Investment grade* captures a bond's default risk and is equal to '1' if the bond's credit rating is BBB- or higher (Standard & Poor's) or Baa3 or higher (Moody's).[13] Riskier bonds pay higher yields. *Callable* and *Subordinated* are two indicators if the issuer retains the privilege of redeeming the bond before maturity, and the bond ranks after other debt instruments in case of liquidation. To measure firms' reputation in the bond market, we include the *Previous bond issue* indicator variable. Reputable firms have already shared information with market participants and, hence, should face lower information asymmetries.

In addition to the firm attributes *Market value*, *Leverage*, *Tangibility*, *Return on Assets,* and *Market-to-book* already described in Section 3.1, we include a set of macroeconomic controls 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 for corporate debt. We measure a country's financial development by the logarithm of the annual gross domestic product (*GDP*). *Country creditworthiness* reflects the credit rating of sovereign debt. We measure *Exchange rate volatility* as the coefficient of variation of daily US$ to local currency exchange rates in a year. We expect bond yields to reflect currency volatilities. We include country, industry, and year fixed effects.

Table 1 presents the number of firm-years with yield data available by country (Panel A) and year (Panel B). We use Thompson Deals and Mergent FISD to collect data on issue size, issue date, bond features, ratings, and coupon rates. For many data items the availability is much sparser for international bonds than for U.S. bonds. We exclude convertible bonds, bonds with

[13] If 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), and use 2.675 as cutoff value to assign investment grade status. The two measures are significantly and positively correlated for the subsample with both available.

floating rate coupons, and bonds with issue sizes smaller than US$ 10 million. If there are multiple offerings per firm and year, we only keep the largest bond. The sample comprises 5,467 bond offerings from 35 countries over the years 1992 to 2012, of which 39 percent are from Japanese firms (see the sensitivity analyses in Section 4.2). Table 2, Panel B, provides summary statistics of the variables used to estimate Eq. (2). The mean bond issue has a size of US$ 252 million, an offering yield of 4.44 percent, and matures in 6.3 years. About 38 and 52 percent of the bond issues are investment grade and from firms that repeatedly access the bond market, respectively. The notes to Table 2 contain further details on the variable measurement.

4 Main results

4.1 Propensity of bond financing analyses

We begin the analyses by examining the propensity of bond financing after U.S. equity cross-listings. Table 3 reports coefficient estimates and (in parentheses) *z*-statistics from estimating Eq. (1). We assess the statistical significance with standard errors clustered by firm. The specifications across the table vary by the composition of the sample we include. Model 1 comprises the full sample of bond issuing and non-issuing firms with and without equity cross-listings over the years 1992 to 2012. In Model 2 we limit the sample to firms that at some point during the sample period have their shares cross-listed in the U.S. This subsample is less subject to selection concerns as, by construction, all firms have affirmatively answered the cost-benefit tradeoff of the cross-listing choice. In Models 3 and 4 we limit the analysis to firms with either a bond or syndicated loan financing over the sample period, and the firm-years in which the bond offering or loan financing took place. In the latter model the dependent variable is set to '1' in years with bond offerings and '0' in years with syndicated loans. These are firms with a proven need for external financing and a sufficient standing to access external markets. For

Models 5 and 6 we split the full sample by the year 2002 of the introduction of SOX. After a series of accounting scandals, SOX aimed at rebuilding public trust in U.S. capital markets by increasing corporate transparency and reliability (e.g., Coates and Srinivasan 2014).[14] SOX arguably has shifted the cost-benefit tradeoff firms face when deciding on a U.S. cross-listing (Doidge 2009, 2010).

Across all six models, *EXCH* is positive and highly significant, indicating an increase in the occurrence of corporate bond offerings following an equity listing on a U.S. exchange relative to the pre-period and the benchmark sample. The coefficient magnitude suggests that the propensity to issue bonds increases between 75 (Model 1) and 491 basis points (Model 5), depending on the comparison. The findings support the notion that the regulatory and disclosure consequences of equity cross-listings translate to bond financing, consistent with Reese and Weisbach (2002) and Lins et al. (2005). Models 3 and 4 show that debt-issuing firms substitute loan financing with corporate bonds, consistent with better transparency and lower information asymmetries between the firm and its lenders after the equity exchange-listing. The effects are largest in the pre-SOX period, but persist after SOX was introduced. Regarding the other ADR types, *PP* is positive and significant in three models, but not in the full sample. Prior literature shows that firms with a private equity placement in the U.S. are growth firms in need of external capital (e.g., Hail and Leuz 2009). The results suggest that they are also more likely to access corporate bond markets. Similarly, firms with stock trading in the U.S. OTC markets tend to issue more bonds (primarily before SOX), but the *OTC* coefficient is smaller in magnitude and statistical significance across all models. The rank ordering of the three ADR variables is

14 Consistent with this argument, Andrade et al. (2014) find that SOX is associated with a significant decrease in the cost of debt mainly due to an increase in corporate transparency.

consistent with exchange-listings conferring the largest monitoring, transparency, and visibility benefits to bond-issuing firms.

The *Cross-listing firm* variable is consistently positive, indicating that these firms more frequently issue bonds to begin with. The significant coefficient underscores the importance of controlling for selection issues. The three debt and equity financing variables are always positive and significant (except for *Loan-issuing firm* in Model 3). This finding suggests that the various avenues of external capital raising complement each other. Firms with a history of raising debt or equity capital are more likely to issue corporate bonds than non-issuing firms. In line with Houston and James (1996) or Cantillo and Wright (2000), we find that larger firms with higher leverage rely more on bond financing. Greater funding needs and better growth prospects are positively related to the issuance of bonds. Riskier firms as measured by a higher volatility of stock returns and the incurrence of losses are less likely to issue bonds. All these control variables have coefficients with the expected signs.

4.2 Bond yield-to-maturity analyses

We next turn to the analysis of the cost of issuing bonds. Panel A of Table 4 reports coefficient estimates and (in parenthesis) *t*-statistics from estimating Eq. (2). We assess the statistical significance with standard errors clustered by firm. The specifications across the table vary by the set of control variables we include and the sample period. Model 1 only contains the bond-specific controls. Because bond features such as maturity or callability likely are determined simultaneously with offering yields, we estimate Model 2 in a reduced form that only includes the firm-specific and macroeconomic controls (see e.g., Qian and Strahan 2007; Miller and Reisel 2012). Model 3 includes the full set of control variables and is estimated for the entire sample. For Models 4 and 5, we split the sample by the introduction of SOX.

Across all five models, *EXCH* is negative and significant, indicating a decrease in bond offering yields after an equity cross-listing on a U.S. exchange relative to the pre-period and the benchmark sample. The coefficient magnitude indicates a reduction in offering yields, on average, by about 38 basis points (Model 3). This estimate translates into yearly cost savings on the order of US$ 1 million per firm, based on the mean bond size of US$ 252 million.[15] The results are present both in the period before and, at lower levels of statistical significance, after SOX. The *OTC* coefficients are negative but insignificant. We find some evidence that private equity placements in the U.S. are associated with lower bond offering yields, but only in the pre-SOX period and at lower levels of statistical significance. The rank ordering of the three ADR variables is consistent with exchange-listings conferring the largest yield benefits to firms, mapping into the propensity test results. Thus, obtaining lower offering yields seems one of the main reasons why corporate bond issues become more popular after non-U.S. firms cross-list their shares on a U.S. exchange.

The control variables are mostly significant and exhibit the expected signs. Local T-bill rates are positively related to bond yields, as are U.S. T-bill rates (except for the post-SOX period), but to a lower extent. Bonds with longer maturities, callable bonds, and bonds that are subordinated in the case of default carry higher offering yields. Bond size, investment grade status, and reputation in the bond market are each associated with lower yields. Large, profitable and less leveraged firms with lots of tangible assets can issue bonds at significantly lower cost. A country's inflation and, somewhat surprisingly, GDP are positively related to bond offering yields, while the credit rating of sovereign debt exhibits a negative relation.

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15 This yearly benefit could be enhanced by additional cost savings associated with future debt issuances at lower offering yields. At the same time, we acknowledge that debt offerings after U.S. equity cross-listings are not costless, but might involve additional compliance, administrative, and reputational costs. We do not provide evidence on these costs and, hence, cannot say whether the debt transactions are net beneficial.

In Panel B of Table 4 we summarize several sensitivity analyses of the bond yield-to-maturity results. The table presents the coefficient estimates (and *t*-statistics) of the cross-listing variables only, but unless indicated otherwise we include all the controls and fixed effects (see Model 3 of Panel A). In the first two models, we use the yield spreads as the dependent variable, computed by either subtracting U.S. or local T-bill rates from bond offering yields. The first adjustment accounts for common time preferences among investors, while the second considers local factors like sovereign risk or inflation in the issuing firm's home country. In both models, the yield effects of U.S. equity exchange-listings are very similar if not stronger than those reported in Panel A.

Next, we examine alternative sample selection choices. In Model 3, we assess the impact of the by far largest country in terms of observations on the results, Japan. We randomly select 300 Japanese firm-years for the analysis, which reduces the weight to a level comparable with other large countries like Canada or South Korea. The *EXCH* coefficient remains significant and negative, but the magnitude is slightly smaller than in the full sample. In Model 4, we allow for multiple bond offerings per firm and year, nearly doubling the number of observations, and in Model 5, we include convertible bonds. In both cases, *EXCH* is significantly negative, and the *OTC* coefficient becomes significant.

Finally, we control for the potential variable bias due to the endogenous nature of firms' cross-listing decision. The *Cross-listing firm* indicator only captures time-invariant (unobserved) differences between ADR and non-ADR firms. In Model 6, we include the inverse Mills ratio from a selection model of the U.S. exchange-listing decision in the regression. That is, we model *EXCH* as a function of the same set of firm-specific variables that we use in the propensity tests (see Table 3) 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 corresponding

inverse Mills ratios, which we include in the second stage as a separate variable. In Model 7, we eliminate the bond offerings in the two years immediately after the cross-listing. This procedure mitigates the anticipation of future bond benefits when firms decide whether to cross-list their shares in the U.S. In Model 8, we interact the *Cross-listing firm* indicator with all the firm-specific controls allowing the weight on these variables to vary between ADR and non-ADR firms. Across all three tests for endogeneity, the results remain very similar to our main findings, and none of the inferences change.

5 Cross-sectional analyses

5.1 Different types of debt (and equity) financing

In our first set of cross-sectional analyses, we investigate different types of debt to shed light on the underlying factors driving the debt-related benefits of U.S. equity cross-listings. We distinguish between bonds issued in public offerings (*Public bonds*), privately placed bonds (*Private bonds*), bonds issued at home (*Domestic bonds*), and bonds issued outside of a firm's home market either as Eurobonds or Yankee bonds (*Foreign bonds*). These bond types differ in terms of the availability of information about the firm, the ease of restructuring and renegotiating the contract terms, and the procedures in case of default. We further analyze the effect of equity cross-listings on alternative sources of external capital, namely the issuance and the cost of syndicated loans (*Loan issue* and *Loan spreads*) and the propensity to raise equity capital (*Equity issue*). Table 5 presents the results, with the propensity of issuance analyses in Panel A and the yield-to-maturity/spread analyses in Panel B.

In Models 1 to 4 of Panel A, we re-estimate Eq. (1) using the different bond-type indictors as dependent variables. In Models 5 and 6, we use *Loan issue* and *Equity issue* as dependent variables, respectively, and slightly adjust the specification of Eq. (1) to reflect the financing

history of the firm. In the loan model, we control for previous loan issues and whether the firm has ever issued a bond or raised equity capital; in the equity model, we control for previous equity issues and whether the firm has ever issued a corporate bond or syndicated loan. All the remaining control variables and fixed effects are the same. The results for the *EXCH* coefficient across the various models reveal the following pattern: after an equity cross-listing on a U.S. exchange, non-U.S. firms are more likely to issue bonds in a public offering and outside of their country of domicile. The likelihood of loan financing also increases. At the same time, these firms issue fewer bonds in their domestic market, while the propensity to privately place a corporate bond or of a seasoned equity offering is unaffected. The coefficients on the *PP* and *OTC* variables are mainly insignificant, except when using *Foreign bonds* (both *PP* and *OTC* are positive) or *Equity issue* (*PP* is positive, *OTC* negative) as the dependent variable. The results are consistent with equity exchange-listings in the U.S. strengthening the information and monitoring position of bondholders. A decrease in information asymmetry for lenders that rely mainly on public information lets the borrowing firms shift from private to public debt (e.g., Leland and Pyle 1977; Diamond 1984; Fama 1985). The results also provide support for the visibility argument stipulating that U.S. cross-listings attract new (foreign) investors.

In Models 1 to 4 of Panel B, we re-estimate Eq. (2), which investigates the determinants of bond yields, for the subsets of bond types discussed above. In Model 5, we use the *Loan Spread* as the dependent variable, defined as the interest rate spread that the borrower pays over the London Interbank Offered Rate (LIBOR) or an equivalent rate for each dollar drawn down.[16] We replace the bond-specific controls in Eq. (2) with an equivalent set of loan-specific variables

16 For the *Loan Spread* analysis, we pare down the propensity sample to syndicated loans with data available in Dealscan, require a minimum loan amount of US$ 10 million, and only retain the loan with the largest facility amount per year. The resulting sample comprises 5,200 loan issues from 46 countries.

(see the notes to Table 5 for details on these loan-specific variables). The results for the *EXCH* coefficient across the various models reveal the following pattern: after an equity cross-listing on a U.S. exchange, non-U.S. firms can issue public bonds and bonds outside of their country of domicile at lower issuing yields. The reduction in yield-to-maturity is on the order of 40 to 53 basis points, a magnitude that is economically significant. These reductions nicely map into the propensity results from Panel A. When the yield benefits are largest, firms react and issue more bonds. Domestic bonds also exhibit a yield reduction, but lower in magnitude and statistical significance. There is no yield reduction apparent for private bonds or syndicated loans, nor for most of the *PP* and *OTC* coefficients. The private bond and syndicated loan results suggest that in markets where private monitoring and communication is common (e.g., Ivashina and Sun 2011), opting out of the local institutional environment does not improve the lenders' position in terms of information and monitoring, and, consequently, offering yields. However, because lenders in these agreements can renegotiate contractual terms at relatively low cost, they might make non-price adjustments such as changing the number of protective covenants, adding performance pricing features, or requiring more revolving loans (e.g., Leftwich 1983; Beatty et al. 2008; Gigler et al. 2009).[17]

5.2 Institutional characteristics of the issuing firm's country of domicile

In our second set of cross-sectional tests, we condition the analyses on institutional characteristics of an issuing firm's country of domicile. Under the bonding hypothesis, equity investors in firms from countries with weak institutions should benefit the most from a U.S. exchange listing (e.g., Doidge et al. 2004; Hail and Leuz 2009). However, whether these benefits translate to the bondholders of the firm is less clear. We use the following three country-

17 The lack of data in Dealscan does not allow us to pursue these alternative channels empirically.

level variables to partition the sample: (i) based on Dyck and Zingales (2004), we distinguish between countries with large and small private benefits of control, measured as the average price premium paid in the acquisition of a controlling equity block. Control benefits serve as proxy for the protection of minority shareholders' interests. The larger the private benefits of control, the weaker the local investor protection (and, hence, the larger the expected benefits from bonding to the U.S. regulatory system). (ii) We use the debt enforcement scores from Djankov et al. (2008) to partition the sample into countries with more and less efficient debt enforcement procedures. The score proxies for the extent to which creditor rights are protected and is measured as the discounted terminal value of a typical firm after all bankruptcy costs. Higher values indicate better chances of debt recovery and quicker resolution of uncertainty for bondholders. (iii) We consider the relative importance of the local bond market by measuring a country's aggregate market capitalization of public bonds over GDP. Higher values stand for relatively more important bond markets. Table 6, Panel A, reports the raw values of the institutional variables together with a binary indicator (created using the sample median as the cut-off), which we use to split the sample countries into two groups.

To analyze the impact of a firm's home country institutions on the debt-related benefits of U.S. equity cross-listings, we repeat the propensity of issuance analyses (Table 6, Panel B) and the yield-to-maturity analyses (Table 6, Panel C) separately for the two groups of countries. We tabulate only the three ADR type variables, but each specification includes the full set of controls and fixed effects. The results from the propensity analyses reveal the following picture: after an equity cross-listing on a U.S. exchange, non-U.S. firms domiciled in countries with small benefits of control, efficient debt enforcement procedures, and developed bond markets are more likely to issue bonds, but not the other way around. The significant *EXCH* coefficient in Model 1 indicates that, contrary to bonding in the equity market, U.S. cross-listings do not

offset the institutional weaknesses of a firm's home country when it comes to bond investors. One explanation is that a stronger position of equity shareholders might come at the expense of debt holders, who bear additional agency costs (Jensen and Meckling 1976; Myers 1977). The significant *EXCH* coefficient in Model 4 suggests that creditor rights protection in the home country remains an important factor (Qian and Strahan 2007). For instance, even though many bond contracts include a "choice of law" clause that allows lenders to use the laws in the country of issuance (e.g., U.K. law if a bond is issued in London) to supersede the laws in the borrower's country of domicile, the clause typically does not extend to bankruptcy proceedings or situations that require the sale of tangible assets to refund secured creditors. The fact that debt enforcement in the home country is key, points to the existence of visibility and liquidity benefits conferred by the certifying role of a U.S. exchange-listing. The significant *EXCH* coefficient in Model 6 conveys the same message. Firms in countries with developed bond markets seem to benefit the most from a U.S. equity cross-listing.

In Panel C, we show the yield-to-maturity results. Consistent with the findings of a higher frequency of bond issuance, the results suggest that after an equity cross-listing on a U.S. exchange, non-U.S. firms domiciled in countries with small private benefits of control, efficient debt enforcement, and developed bond markets can issue bonds at lower offering yields of about 40 to 47 basis points. We find no evidence of lower offering yields for the other countries.

6 Conclusion

We examine whether cross-listing equity shares on a U.S. exchange facilitates non-U.S. firms' access to bond markets. Prior literature primarily focused on the equity market benefits of 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 bond investors. However, poor creditor protection in cross-listed firms' countries of domicile and higher agency costs between debt and equity holders might mitigate these benefits.

We employ a comprehensive panel of corporate bonds spanning 46 countries and 20 years to analyze the incidence and cost of bond issuance. We find that non-U.S. firms are more likely to issue bonds after cross-listing on a U.S. exchange at offering yields that, on average, are lower by about 38 basis points. Firms issue more public bonds and bonds in foreign markets, suggesting that the certification role of equity cross-listings mainly benefits investors without privileged access to inside information and that were unfamiliar with the firm. We also show that equity cross-listings do not completely offset the institutional weaknesses in a firm's home country, and are concentrated in countries with small private benefits of control, efficient debt enforcement procedures, and developed bond markets, consistent with increased visibility and, hence, higher liquidity from the equity cross-listing.

Several caveats are in order when interpreting the results. First, our analysis focuses on one of the many external-funding sources available to firms (i.e., bond financing). 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 on a U.S. exchange, under certain conditions, generates benefits for bondholders. However, we cannot eliminate the possibility that the causality runs the other way, that is, that cross-listings are undertaken in light of already lower costs of bond 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 cross-listings, the location of bond issuance, bond types, or country characteristics. Third, we provide evidence in support of the information disclosure and liquidity arguments of cross-listing.

However, a better understanding of the interplay between these forces is needed. We leave these issues to future research.

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Table 1 Sample composition and descriptive statistics by country and year

Panel A: Number of observations, type of U.S. equity cross-listing, debt and equity financing by country

Country	Unique firms	Firm-years	Firm-years with yield	U.S. equity cross-listings			Bond financing				Loan financing	Equity financing
				PP	*OTC*	*EXCH*	*Bond*	*Public*	*Domestic*	*Foreign*		
Argentina	64	572	1	32	22	108	41	31	4	37	20	24
Australia	1,558	8,842	90	51	761	207	130	76	57	86	229	2,979
Austria	99	771	24	45	204	6	30	26	24	6	13	61
Belgium	133	1,128	31	0	47	15	32	31	19	14	34	72
Brazil	287	2,221	35	98	307	231	57	26	18	42	56	165
Canada	1,669	9,570	395	3	1,270	1,751	445	366	235	240	426	2,662
Chile	132	1,377	37	20	11	143	38	30	29	10	44	55
China	1,794	16,187	228	32	83	77	177	79	163	15	54	1,183
Colombia	36	197	1	21	5	4	3	2	1	2	7	7
Czech Republic	55	258	0	17	0	0	6	6	0	6	5	2
Denmark	172	1,767	5	0	10	39	12	12	3	10	16	97
Egypt	79	419	0	56	16	0	1	1	1	0	4	14
Finland	156	1,740	23	37	38	54	47	39	34	14	63	128
France	924	7,688	224	67	252	248	364	338	144	241	299	479
Germany	813	6,569	85	58	249	193	148	125	60	93	210	497
Greece	258	1,524	0	56	15	14	3	2	0	3	33	69
Hong Kong	622	5,554	57	12	632	100	98	59	29	70	263	861
India	1,379	7,148	249	1,011	27	62	308	260	266	49	208	569
Indonesia	258	2,129	0	15	19	20	14	9	12	2	90	39
Ireland	102	785	0	1	100	81	15	10	14	1	36	125
Israel	273	1,343	1	7	17	92	5	4	2	3	15	134
Italy	325	3,007	50	88	43	91	63	55	37	28	93	197
Japan	4,091	40,157	2,142	13	426	414	1,934	1,811	1,626	385	355	1,898
Korea (South)	1,412	10,496	677	272	25	104	881	719	793	129	279	772
Malaysia	689	6,241	91	0	108	0	114	11	99	16	102	480
Mexico	117	1,156	49	169	241	251	77	46	32	51	63	57
The Netherlands	216	2,208	48	38	174	201	81	70	21	66	94	151
New Zealand	138	950	0	0	9	36	25	18	19	6	11	88
Norway	275	1,927	25	27	96	59	41	31	16	27	55	259
Pakistan	99	833	0	34	0	0	1	1	0	1	14	6
Peru	72	497	33	21	25	16	37	36	35	2	4	17
Philippines	122	1,071	22	72	22	18	35	12	25	13	45	86
Poland	316	1,921	0	105	34	1	4	1	0	4	19	130
Portugal	84	719	6	25	38	23	7	6	2	5	15	38
Russia	188	692	30	202	125	25	32	24	24	13	44	33

Table 1 (continued)

Country	Unique firms	Firm-years	Firm-years with yield	U.S. equity cross-listings			Bond financing				Loan financing	Equity financing
				PP	*OTC*	*EXCH*	*Bond*	*Public*	*Domestic*	*Foreign*		
Singapore	489	4,287	105	21	200	16	126	82	107	22	139	499
South Africa	346	2,389	4	69	234	127	9	6	4	5	29	91
Spain	157	1,396	27	14	37	67	28	27	14	16	109	138
Sri Lanka	77	252	0	18	0	0	1	1	0	1	1	4
Sweden	412	3,282	48	5	98	96	59	53	31	33	98	342
Switzerland	243	2,716	98	47	57	91	139	130	104	36	115	120
Taiwan	1,467	13,019	145	655	4	80	264	193	207	63	962	1,269
Thailand	392	3,461	156	22	88	7	156	127	137	25	118	230
Turkey	212	1,657	0	77	23	10	4	1	1	3	24	73
United Arab Emirates	41	198	0	1	0	0	0	0	0	0	7	11
United Kingdom	1,738	13,678	225	96	630	583	269	198	130	165	467	1,802
Total	24,581	195,999	5,467	3,730	6,822	5,761	6,361	5,191	4,579	2,059	5,387	19,013

Panel B: Number of observations, type of U.S. equity cross-listing, debt and equity financing by year

Year	Firm-years	Firm-years with yield	U.S. equity cross-listings			Bond financing				Loan financing	Equity financing
			PP	*OTC*	*EXCH*	*Bond*	*Public*	*Domestic*	*Foreign*		
1992	2,167	182	16	76	107	100	90	26	86	17	56
1993	2,485	216	24	90	123	161	143	51	119	40	106
1994	2,847	105	30	120	151	137	122	57	90	74	151
1995	3,215	158	69	146	162	146	129	87	79	118	136
1996	3,953	207	123	186	187	250	223	121	148	202	189
1997	4,391	180	137	216	230	209	180	119	101	222	213
1998	4,663	243	154	220	261	213	200	150	72	157	254
1999	5,132	167	175	250	304	194	175	98	103	198	303
2000	8,893	187	182	275	349	298	243	198	108	261	608
2001	10,031	227	178	287	382	356	307	257	115	378	590
2002	10,642	208	171	302	389	336	290	243	105	332	751
2003	11,384	242	198	330	398	369	291	236	144	351	1,063
2004	12,408	228	212	339	393	331	226	198	150	367	1,465
2005	13,382	236	231	350	386	324	236	194	139	387	1,439
2006	14,268	218	255	361	356	314	252	173	149	401	1,501
2007	15,291	265	258	418	312	288	201	256	42	363	1,977
2008	14,486	294	263	390	275	324	252	297	35	336	1,373
2009	14,406	466	264	430	265	507	410	460	62	253	1,944
2010	15,014	472	286	474	260	525	429	476	68	324	1,883
2011	14,550	494	291	698	263	510	413	468	63	342	1,640
2012	12,391	472	213	864	208	469	379	414	81	264	1,371
Total	195,999	5,467	3,730	6,822	5,761	6,361	5,191	4,579	2,059	5,387	19,013

Table 1 (continued)

The sample comprises a maximum of 195,999 firm-year observations from 46 countries between 1992 and 2012 for which sufficient Worldscope financial data and Datastream stock price data exist. We exclude financial firms (one-digit SIC code equal to 6), and require a minimum market value of US$ 10 million. We only include countries with more than 30 unique firms and at least one American Depositary Receipt or direct listing in the U.S. (ADR). The yield-to-maturity sample comprises non-convertible fixed-rate bonds with a minimum bond amount of 10 US$ million. If a firm has multiple issues in a given year, we retain only the bond with the largest principal amount. The table reports the number of unique firms, total firm-years, firm-years with bond yield-to-maturity data, and firm-years with ADRs, bond, loan, and equity financing by country (Panel A) and year (Panel B). 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. 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). We further distinguish between bonds issued in public market offerings (*Public bonds*), in the firms' country of domicile (*Domestic bonds*), or abroad, either as a Eurobond or Yankee bond in the U.S. (*Foreign bonds*). *Loan issue* is equal to 1 if the firm undertakes a syndicated loan offering (source: Dealscan). *Equity issue* is equal to 1 if the firm externally raises shareholders' equity capital (source: SDC Platinum).

Table 2 Descriptive statistics of variables used in regression analyses

Panel A: Variables used in propensity of debt (or equity) financing regressions

Variables (N=195,999)	Mean	Std. dev.	P1	P25	Median	P75	P99
Cross-listing variables (indicators):							
PP	0.019	0.137					
OTC	0.035	0.183					
EXCH	0.029	0.169					
Cross-listing firm	0.114	0.318					
Debt and equity financing variables (indicators):							
Bond issue	0.032	0.177					
Previous bond issue	0.047	0.212					
Bond-issuing firm	0.191	0.393					
Previous loan issue	0.044	0.205					
Loan-issuing firm	0.168	0.374					
Previous equity issue	0.175	0.380					
Equity-issuing firm	0.561	0.496					
Firm-specific controls:							
Market value (US$ million)	1,227	6,709	11	42	131	471	19,950
Leverage (ratio)	0.110	0.127	0.000	0.002	0.065	0.177	0.525
Tangibility (ratio)	0.325	0.221	0.003	0.148	0.297	0.469	0.881
Return on assets (ratio)	0.046	0.103	-0.368	0.013	0.051	0.097	0.264
Negative earnings (indicator)	0.194	0.396					
Funding needs (ratio)	-0.054	0.106	-0.282	-0.109	-0.060	-0.012	0.311
Market-to-book (ratio)	2.079	2.146	0.274	0.822	1.411	2.480	11.620
Return variability (std. dev.)	0.126	0.077	0.034	0.075	0.107	0.155	0.424

Panel B: Variables used in bond yield-to-maturity regressions

Variables (N=5,467)	Mean	Std. dev.	P1	P25	Median	P75	P99
Cross-listing variables (indicators):							
PP	0.053	0.224					
OTC	0.066	0.249					
EXCH	0.081	0.273					
Cross-listing firm	0.260	0.439					
Bond-specific variables:							
Bond yield-to-maturity (percent)	4.44%	2.79%	0.52%	2.00%	4.26%	6.09%	12.00%
U.S. T-bill rate (percent)	3.73%	1.96%	0.27%	1.97%	3.93%	5.27%	7.26%
Local T-bill rate (percent)	3.44%	2.29%	0.37%	1.41%	3.26%	4.84%	9.93%
Bond maturity (months)	76.0	46.0	12.0	48.6	60.5	90.2	246.7
Bond size (US$ million)	251.5	307.4	11.6	69.7	142.5	300.0	1,500.0
Investment grade (indicator)	0.382	0.486					
Callable (indicator)	0.120	0.325					
Subordinated (indicator)	0.005	0.069					
Previous bond issues (indicator)	0.523	0.500					

Table 2 (continued)

Variables (N=5,467)	Mean	Std. dev.	P1	P25	Median	P75	P99
Firm-specific controls:							
Market value (US$ million)	6,873	14,953	46	679	2,296	6,819	82,034
Leverage (ratio)	0.247	0.132	0.003	0.154	0.227	0.322	0.606
Tangibility (ratio)	0.418	0.232	0.019	0.232	0.392	0.585	0.913
Return on assets (ratio)	0.058	0.052	-0.062	0.028	0.050	0.081	0.224
Market-to-book (ratio)	1.981	1.588	0.291	1.055	1.585	2.397	8.563
Macroeconomic controls:							
Inflation (percent)	1.96%	2.44%	-1.35%	0.13%	1.71%	2.81%	11.99%
GDP (log US$)	14.261	1.108	11.504	13.647	14.557	15.256	15.374
Country creditworthiness (rating)	82.336	10.975	47.650	77.350	86.500	91.050	94.700
Exchange rate volatility (ratio)	0.037	0.024	0.000	0.021	0.031	0.046	0.150

The sample comprises a maximum of 195,999 firm-year observations from 46 countries between 1992 and 2012, of which 5,467 have bond yield-to maturity data (see Table 1). The table reports descriptive statistics for the variables used in the propensity of debt financing analyses (Panel A) and the bond yield-to-maturity analyses (Panel B). The cross-listing 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 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). *Equity issue* is equal to 1 if the firm externally raises shareholders' equity capital (source: SDC Platinum). *Previous bond* (*Loan* or *Equity*) *issue* is an indicator variable equal to 1 if the firm has issued another bond (loan or equity) within the last two fiscal years. We also define separate *Bond-*, *Loan-*, and *Equity-issuing firm* indicators, set equal to 1 if the firm engages in the respective financing transactions during the sample period. The firm-specific controls consist of the following variables: we compute *Market value* of equity, denominated in US$ million, as stock price times the number of shares outstanding. *Leverage* is the ratio of long-term debt divided by total assets. *Tangibility* is measured as the ratio of the net 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 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. We use the following bond-specific variables: *Bond yield-to-maturity* is measured at the time of the issuance of the bond. *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. We use the following macroeconomic control variables: *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 3 Changes in propensity of bond financing after U.S. equity cross-listings

Bond issue as dependent variable	Model 1 (all firms)	Model 2 (ADR firms only)	Model 3 (debt issuing firms only)	Model 4 (firm-years with debt issuances only)	Model 5 (pre SOX period 1992 to 2001)	Model 6 (post SOX period 2002 to 2012)
Cross-listing variables:						
PP	0.085	0.188***	0.133**	-0.029	0.196**	0.059
	(1.57)	(2.93)	(2.45)	(-0.31)	(2.29)	(0.97)
OTC	0.076*	0.093*	0.093*	0.077	0.164**	0.042
	(1.66)	(1.94)	(1.90)	(0.92)	(1.97)	(0.84)
EXCH	0.150***	0.234***	0.194***	0.176**	0.363***	0.159***
	(3.56)	(5.65)	(4.21)	(2.05)	(4.86)	(2.21)
Cross-listing firm	0.260***	n.a.	0.160***	0.286***	0.215***	0.290***
	(6.90)		(4.07)	(4.16)	(3.53)	(6.68)
Debt and equity financing variables:						
Previous bond issue	1.138***	0.876***	0.790***	0.909***	0.922***	1.165***
	(47.00)	(21.94)	(34.19)	(21.34)	(23.23)	(40.19)
Loan-issuing firm	0.484***	0.366***	-0.104***	n.a.	0.428***	0.516***
	(23.06)	(9.40)	(-4.20)		(12.93)	(21.19)
Equity-issuing firm	0.090***	0.169***	0.079***	0.131***	0.117***	0.078***
	(4.75)	(4.10)	(3.55)	(2.79)	(3.92)	(3.50)
Firm-specific controls:						
Log(*Market value*)	0.430***	0.239***	0.363***	0.229**	0.394***	0.416***
	(7.62)	(4.60)	(6.97)	(2.55)	(4.55)	(7.13)
Leverage	2.166***	2.167***	1.922***	1.104***	2.009***	2.204***
	(36.79)	(17.68)	(25.17)	(7.11)	(18.38)	(32.67)
Tangibility	-0.067	0.079	0.016	-0.005	-0.123	0.003
	(-1.50)	(0.82)	(0.29)	(-0.05)	(-1.51)	(0.07)
Return on assets	-0.003	0.515*	-0.158	-0.606	-0.095	0.092
	(-0.02)	(1.81)	(-0.82)	(-1.43)	(-0.38)	(0.56)
Negative earnings	-0.233***	-0.172***	-0.195***	-0.262***	-0.217***	-0.227***
	(-7.86)	(-2.73)	(-5.58)	(-3.34)	(-3.91)	(-6.44)
Funding needs	0.461***	0.502***	0.787***	0.069	0.492**	0.445***
	(5.11)	(2.72)	(5.77)	(0.23)	(2.51)	(4.38)
Market-to-book	0.017***	0.013*	0.031***	0.023**	0.029***	0.006
	(4.78)	(1.87)	(6.58)	(2.09)	(4.95)	(1.25)
Return variability	-1.116***	-1.819***	-1.063***	-1.853***	-1.081***	-1.212***
	(-8.22)	(-5.91)	(-6.75)	(-5.28)	(-4.58)	(-7.29)
Fixed effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
Pseudo R^2	33.41%	29.25%	18.56%	27.73%	32.12%	34.73%
N	195,999	22,203	54,285	7,898	46,499	147,633

Table 3 (continued)

The sample comprises a maximum of 195,999 firm-year observations from 46 countries between 1992 and 2012 (see Table 1). The table reports coefficient estimates and (in parentheses) z-statistics based on standard errors clustered by firm from probit regressions of debt financing on firms' cross-listing status and various control variables. The dependent variable is *Bond issue* set equal to 1 if the firm undertakes a public or private fixed-rate bond offering in a given year. For a description of the independent variables see Table 2. We use log transformations where indicated, and include country (C), one-digit SIC industry (I), and year (Y) 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. In Models 5 and 6 we include all observations, but separately analyze the period before and after the Sarbanes-Oxley Act (SOX) was implemented in 2002. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 4 Changes in average cost of bond financing after U.S. equity cross-listings

Panel A: OLS regression analysis of bond yield-to-maturity

Bond yield-to-maturity as dependent variable	Model 1 (all firms)	Model 2 (all firms)	Model 3 (all firms)	Model 4 (pre SOX period 1992 to 2001)	Model 5 (post SOX period 2002 to 2012)
Cross-listing variables:					
PP	-0.322*	-0.294*	-0.305*	-0.628**	-0.178
	(-1.83)	(-1.72)	(-1.87)	(-1.99)	(-0.99)
OTC	-0.091	-0.132	-0.128	-0.050	-0.116
	(-0.66)	(-0.96)	(-1.01)	(-0.22)	(-0.83)
EXCH	-0.495***	-0.372**	-0.376***	-0.209***	-0.296*
	(-3.53)	(-2.55)	(-2.75)	(-2.50)	(-1.85)
Cross-listing firm	-0.036	-0.063	0.027	0.066	-0.042
	(-0.34)	(-0.61)	(0.27)	(0.50)	(-0.34)
Bond-specific variables:					
U.S. T-bill rate	0.044	0.087**	0.053	0.397***	-0.084**
	(1.14)	(2.44)	(1.42)	(6.84)	(-1.97)
Local T-bill rate	0.474***	0.420***	0.416***	0.444***	0.282***
	(12.98)	(10.86)	(10.86)	(6.63)	(4.79)
Log(*Bond maturity*)	0.149**	n.a.	0.145**	0.176	0.244***
	(2.22)		(2.23)	(1.35)	(3.47)
Log(*Bond size*)	-0.031	n.a.	-0.044	0.115**	-0.172***
	(-0.86)		(-1.20)	(2.15)	(-3.97)
Investment grade	-0.480***	n.a.	-0.296***	-0.039	-0.455***
	(-8.34)		(-5.10)	(-0.45)	(-6.80)
Callable	0.575***	n.a.	0.668***	0.321**	0.913***
	(5.28)		(6.32)	(2.05)	(6.88)
Subordinated	0.685	n.a.	0.436	0.001	1.436***
	(1.58)		(0.94)	(0.00)	(3.24)
Previous bond issues	-0.163***	n.a.	-0.255***	-0.179**	-0.214***
	(-3.67)		(-5.78)	(-2.42)	(-4.21)
Firm-specific controls:					
Log(*Market value*)	n.a.	-0.389**	-0.220	0.172	-0.448***
		(-2.29)	(-1.29)	(0.93)	(-3.31)
Leverage	n.a.	2.117***	2.145***	1.686***	1.893***
		(8.49)	(8.52)	(4.26)	(6.53)
Tangibility	n.a.	-0.449***	-0.410***	0.025	-0.623***
		(-2.94)	(-2.79)	(0.09)	(-3.75)
Return on assets	n.a.	-1.891***	-1.343**	-3.286**	-0.950
		(-2.85)	(-2.07)	(-2.25)	(-1.42)
Market-to-book	n.a.	-0.042**	-0.030	-0.078***	0.010
		(-2.14)	(-1.57)	(-2.72)	(0.39)
Macroeconomic controls:					
Inflation	n.a.	0.161***	0.160***	0.296***	0.083***
		(5.65)	(5.67)	(4.01)	(3.10)
Log(*GDP*)	n.a.	0.971*	1.919***	2.859*	4.582***
		(1.79)	(3.47)	(1.73)	(8.24)
Country creditworthiness	n.a.	-0.039***	-0.050***	-0.044	-0.076***
		(-3.59)	(-4.63)	(-1.25)	(-6.33)
Exchange rate volatility	n.a.	3.877**	3.421**	-1.354	1.971
		(2.19)	(2.00)	(-0.43)	(1.00)
Fixed effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
Adj. R^2	73.40%	73.99%	74.89%	75.35%	77.85%
N	5,467	5,467	5,467	1,872	3,595

Table 4 (continued)

Panel B: Sensitivity analyses

Models	N	Cross-listing variables			
		PP	*OTC*	*EXCH*	*Cross-listing firm*
Alternative dependent variables:					
(1) Bond spreads adjusted for U.S. T-bill rate	5,467	-0.302* (-1.68)	-0.165 (-1.26)	-0.309** (-2.09)	0.061 (0.56)
(2) Bond spreads adjusted for local T-bill rate	5,454	-0.204 (-1.21)	-0.085 (-0.58)	-0.436*** (-2.94)	-0.046 (-0.41)
Alternative sample composition:					
(3) Only 300 firm-years from Japan	3,625	-0.150 (-0.90)	-0.040 (-0.28)	-0.216*** (-2.58)	-0.074 (-0.67)
(4) Multiple bond issues per year	10,557	-0.276 (-1.46)	-0.319** (-2.46)	-0.460*** (-3.32)	0.159 (1.50)
(5) Including convertible bonds	6,210	-0.246 (-1.55)	-0.225* (-1.73)	-0.384*** (-2.81)	0.041 (0.42)
Control for endogeneity of U.S. cross-listing:					
(6) Selection model for *EXCH* (including inverse Mills ratio)	4,678	-0.386** (-2.22)	-0.153 (-1.13)	-0.408*** (-3.01)	-0.008 (-0.08)
(7) Remove two years following U.S. cross-listing	5,200	-0.231 (-1.35)	-0.202 (-1.31)	-0.260*** (-2.80)	-0.075 (-0.72)
(8) Interact cross-listing firm indicator with firm-specific controls	5,467	-0.641*** (-3.26)	-0.066 (-0.51)	-0.283* (-1.91)	0.361** (2.43)

The yield-to-maturity sample comprises a maximum of 5,467 firm-year observations from 46 countries between 1992 and 2012 (see Table 1). In Panel A, 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. The dependent variable is the *Bond yield-to-maturity* measured at the time of the issuance of the bond. For a description of the independent variables see Table 2. We use log transformations where indicated, and include country (C), one-digit SIC industry (I), and year (Y) fixed effects in the regressions, but do not report the coefficients. Models 1 to 3 use all firm-year observations. In Models 4 and 5 we separately analyze the period before and after the Sarbanes-Oxley Act (SOX) was implemented in 2002. In Panel B, we summarize various sensitivity analyses. Unless stated otherwise, we estimate the same specification as in Model 3 of Panel A, but only report 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 limit the influence of Japan, the largest sample country, to 300 randomly selected firm-years. (4) We allow for multiple bond issues in a given year. (5) We include convertible bonds in the sample. (6) 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 market value, financial leverage, tangibility, return on assets, a negative earnings indicator, funding needs, the market-to-book ratio, return variability, Altman's (1968) Z-score, and country and industry fixed effects. We then estimate the resulting probit regression separately for each year and compute the corresponding inverse Mills ratios. (7) We remove observations from the two years immediately following a U.S. equity cross-listing from the sample. (8) We allow for separate relations for ADR and non-ADR firms. That is, we include interaction terms between the *Cross-listing firm* indicator and each of the firm-specific control variables in the model. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 5 Analysis of alternative debt (and equity) financing instruments around U.S. equity cross-listings

Panel A: Changes in propensity of issuance

	Model 1 (*Public bonds* as dependent variable)	Model 2 (*Private bonds* as dependent variable)	Model 3 (*Domestic bonds* as dependent variable)	Model 4 (*Foreign bonds* as dependent variable)	Model 5 (*Loan issues* as dependent variable)	Model 6 (*Equity issues* as dependent variable)
Cross-listing variables:						
PP	0.036	0.128	-0.060	0.220***	0.142***	0.189***
	(0.60)	(1.57)	(-0.86)	(3.02)	(2.79)	(4.68)
OTC	0.071	0.066	0.040	0.150**	0.010	-0.095***
	(1.39)	(0.92)	(0.69)	(2.46)	(0.23)	(-3.22)
EXCH	0.167***	-0.011	-0.238***	0.438***	0.125***	-0.039
	(3.46)	(-0.16)	(-3.90)	(8.07)	(2.86)	(-1.12)
Cross-listing firm	0.261***	0.161***	0.252***	0.256***	0.169***	0.095***
	(6.14)	(2.68)	(5.32)	(5.18)	(4.69)	(3.81)
Debt and equity financing variables:						
Previous bond issue	1.114***	0.614***	1.141***	0.698***	n.a.	n.a.
	(43.81)	(17.17)	(44.31)	(20.49)		
Previous loan issue	n.a.	n.a.	n.a.	n.a.	0.924***	n.a.
					(36.18)	
Previous equity issue	n.a.	n.a.	n.a.	n.a.	n.a.	0.515***
						(47.47)
Bond-issuing firm	n.a.	n.a.	n.a.	n.a.	0.445***	0.074***
					(21.84)	(5.36)
Loan-issuing firm	0.438***	0.442***	0.516***	0.364***	n.a.	0.120***
	(18.19)	(13.48)	(19.92)	(13.03)		(8.59)
Equity-issuing firm	0.071***	0.134***	0.053**	0.172***	0.174***	n.a.
	(3.33)	(4.42)	(2.32)	(6.29)	(9.00)	
Firm-specific controls	included	included	included	included	included	included
Fixed effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
Pseudo R^2	34.60%	19.84%	34.56%	31.25%	25.73%	16.47%
N	195,999	192,470	191,211	195,580	195,999	195,999

In Panel A, the sample comprises a maximum of 195,999 firm-year observations from 46 countries between 1992 and 2012 (see Table 1). The panel reports coefficient estimates and (in parentheses) *z*-statistics based on standard errors clustered by firm from probit regressions of debt and equity financing on firms' cross-listing status and various control variables. In Models 1 to 4, the dependent variable is a binary indicator for bonds issued in public market offerings (*Public bonds*), private offerings (*Private bonds*), the firms' country of domicile (*Domestic bonds*), or abroad (*Foreign bonds*) in a given year, respectively. In Model 5, the dependent variable is *Loan issue* set equal to 1 if the firm undertakes a syndicated loan offering. In Model 6, the dependent variable is *Equity issue* set equal to 1 if the firm externally raises shareholders' equity capital. Model 1 from Table 3 serves as base specification, but we do not report all the coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 5 (continued)

Panel B: Changes in cost of issuance

Bond yield-to-maturity as dependent variable	Model 1 (*Public bonds*)	Model 2 (*Private bonds*)	Model 3 (*Domestic bonds*)	Model 4 (*Foreign bonds*)	Model 5 (*Syndicated loans*)	*Loan spreads* as dependent variable
Cross-listing variables:						Cross-listing variables:
PP	-0.316*	-0.081	-0.130	-0.299	-0.120	*PP*
	(-1.78)	(-0.22)	(-0.81)	(-0.64)	(-0.77)	
OTC	-0.168	0.140	0.116	-0.492*	-0.142	*OTC*
	(-1.37)	(0.42)	(0.99)	(-1.77)	(-1.13)	
EXCH	-0.408***	0.244	-0.225*	-0.531**	-0.070	*EXCH*
	(-2.85)	(0.67)	(-1.78)	(-2.18)	(-0.52)	
Cross-listing firm	0.039	-0.117	-0.126	0.352*	0.136	*Cross-listing firm*
	(0.40)	(-0.37)	(-1.22)	(1.80)	(1.37)	
Bond-specific variables:						Loan-specific variables:
U.S. T-bill rate	0.048	0.167**	-0.022	0.306***	0.194***	Log(*Loan maturity*)
	(1.10)	(2.18)	(-0.56)	(3.33)	(4.18)	
Local T-bill rate	0.413***	0.228***	0.484***	0.154**	0.034	Log(*Loan size*)
	(8.11)	(3.40)	(10.27)	(2.11)	(1.12)	
Log(*Bond maturity*)	0.118*	0.145	0.060	0.514**	-0.183***	*Investment grade*
	(1.66)	(1.03)	(0.96)	(2.47)	(-3.62)	
Log(*Bond size*)	-0.082**	-0.178**	-0.148***	0.183**	0.738***	*Term loans*
	(-1.96)	(-2.40)	(-3.89)	(2.43)	(9.69)	
Investment grade	-0.179***	-0.543***	-0.187***	-0.808***	-0.049***	*Number of lenders*
	(-2.88)	(-4.45)	(-3.56)	(-5.76)	(-10.98)	
Callable	0.600***	0.563***	0.666***	0.087	-0.094**	*Previous loan issues*
	(4.39)	(3.54)	(4.72)	(0.60)	(-2.09)	
Subordinated	-0.284	1.443**	0.863	-0.002	-0.108*	*Performance pricing*
	(-0.64)	(2.33)	(1.18)	(-0.00)	(-1.74)	
Previous bond issues	-0.174***	-0.387***	-0.163***	-0.349***	-0.224***	*Revolver*
	(-3.68)	(-3.76)	(-3.75)	(-2.99)	(-3.79)	
Firm-specific & macro-economic controls	included	included	included	included	included	Firm-specific & macro-economic controls
Fixed effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	Fixed effects
Adj. R^2	78.99%	65.47%	81.42%	62.85%	31.13%	Adj. R^2
N	4,221	1,246	4,208	1,259	5,200	N

Table 5 (continued)

In Panel B, the yield-to-maturity sample comprises a maximum of 5,467 firm-year observations from 46 countries between 1992 and 2012 (see Table 1). The panel reports 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, we limit the sample to bonds issued in public market offerings (*Public bonds*), private offerings (*Private bonds*), the firms' country of domicile (*Domestic bonds*), or abroad (*Foreign bonds*), respectively. Model 3 from Table 4, Panel A, serves as base specification, but we do not report all the coefficients. 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 5,200 firm-year observations from 38 countries between 1992 and 2012 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. We replace the bond characteristics with the following loan-specific controls: *Loan maturity* is measured in months at the date of the issuance. *Loan size* equals the facility amount in US$ million. *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. *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. *Performance pricing* and *Revolver* are indicator variables set equal to 1 if the loan facility uses performance pricing or 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. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 6 Cross-sectional analysis of bond financing around U.S. equity cross-listings

Panel A: Institutional characteristics by firms' country of domicile

Country	*Private benefits of control* (1=large)		*Debt enforcement* (1=high efficiency)		*Importance of bond markets* (1=high)	
Argentina	0.27	(1)	35.8	(0)	0.11	(0)
Australia	0.02	(0)	87.8	(1)	0.20	(0)
Austria	0.38	(1)	78.0	(1)	0.32	(1)
Belgium	n.a.	n.a.	90.8	(1)	0.96	(1)
Brazil	0.65	(1)	13.4	(0)	0.39	(1)
Canada	0.01	(0)	93.2	(1)	0.61	(1)
Chile	0.18	(1)	40.9	(0)	0.27	(0)
China	n.a.	n.a.	43.6	(0)	0.08	(0)
Colombia	0.27	(1)	64.8	(0)	0.18	(0)
Czech Republic	0.58	(1)	40.7	(0)	0.40	(1)
Denmark	0.08	(1)	76.7	(1)	0.52	(1)
Egypt	0.04	(0)	28.6	(0)	n.a.	n.a.
Finland	0.02	(0)	92.4	(1)	0.34	(1)
France	0.02	(0)	54.1	(0)	0.45	(1)
Germany	0.10	(1)	57.0	(0)	0.32	(1)
Greece	n.a.	n.a.	53.8	(0)	0.62	(1)
Hong Kong	0.00	(0)	88.3	(1)	0.09	(0)
India	n.a.	n.a.	n.a.	n.a.	0.23	(0)
Indonesia	0.07	(0)	25.1	(0)	0.18	(0)
Ireland	n.a.	n.a.	89.9	(1)	0.24	(0)
Israel	0.27	(1)	66.2	(0)	n.a.	n.a.
Italy	0.37	(1)	45.3	(0)	0.86	(1)
Japan	-0.04	(0)	95.5	(1)	0.79	(1)
Korea (South)	0.16	(1)	88.1	(1)	0.21	(0)
Malaysia	0.07	(0)	48.4	(0)	0.36	(1)
Mexico	0.34	(1)	72.6	(1)	0.13	(0)
The Netherlands	0.02	(0)	94.9	(1)	0.44	(1)
New Zealand	0.03	(0)	90.7	(1)	0.29	(0)
Norway	0.01	(0)	91.8	(1)	0.17	(0)
Pakistan	n.a.	n.a.	n.a.	n.a.	0.36	(1)
Peru	0.14	(1)	41.8	(0)	0.08	(0)
Philippines	0.13	(1)	17.5	(0)	0.33	(1)
Poland	0.13	(1)	67.7	(1)	0.26	(0)
Portugal	0.20	(1)	82.3	(1)	0.38	(1)
Russia	n.a.	n.a.	39.0	(0)	0.03	(0)
Singapore	0.03	(0)	96.1	(1)	0.25	(0)
South Africa	0.02	(0)	39.8	(0)	0.39	(1)
Spain	0.04	(0)	82.0	(1)	0.43	(1)
Sri Lanka	n.a.	n.a.	45.7	(0)	n.a.	n.a.
Sweden	0.07	(0)	86.0	(1)	0.43	(1)
Switzerland	0.06	(0)	60.4	(0)	0.23	(0)
Taiwan	0.00	(0)	93.8	(1)	0.14	(0)
Thailand	0.12	(1)	54.9	(0)	0.14	(0)
Turkey	0.37	(1)	6.6	(0)	0.18	(0)
United Arab Emirates	n.a.	n.a.	21.8	(0)	n.a.	n.a.
United Kingdom	0.01	(0)	92.3	(1)	0.32	(1)

Panel A presents raw values and (in parentheses) binary indicators of the country-level variables used to partition the sample into two. We split the institutional variables by the sample median. *Private benefits of control* is taken from Dyck and Zingales (2004) and represents the mean price premium paid for the acquisition of a controlling block. Higher values stand for larger control benefits. We use the Djankov et al. (2008) *Debt enforcement* score, measured as the discounted terminal value of a typical firm after bankruptcy costs (in percent of firm value). Higher values stand for countries with more efficient debt enforcement. We measure the *Importance of bond markets* in a country as the aggregate market capitalization of public bonds in percent of GDP (source: World Bank). We tabulate sample period means. Higher values indicate countries with relatively more important bond markets.

Table 6 (continued)

	Private benefits of control		*Debt enforcement*		*Importance of bond markets*	
	Model 1 (small)	Model 2 (large)	Model 3 (low efficiency)	Model 4 (high efficiency)	Model 5 (low)	Model 6 (high)
Panel B: Changes in propensity of bond financing conditional on firms' country of domicile (*Bond issue* as dependent variable)						
Cross-listing variables:						
PP	0.094	0.263***	0.024	0.225***	0.145**	0.141
	(0.97)	(2.97)	(0.19)	(3.53)	(2.06)	(1.04)
OTC	0.034	-0.039	0.002	0.083	-0.089	0.136**
	(0.61)	(-0.44)	(0.02)	(1.53)	(-1.09)	(2.43)
EXCH	0.131***	0.154	0.109	0.157***	0.102	0.148***
	(2.80)	(1.54)	(1.24)	(3.13)	(1.20)	(2.96)
Debt and equity financing & firm-specific controls	included	included	included	included	included	included
Fixed effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
Pseudo R^2	33.79%	37.60%	32.12%	34.64%	31.27%	35.56%
N	128,192	39,060	62,467	125,353	85,570	108,217
Panel C: Changes in cost of bond financing conditional on firms' country of domicile (*Bond yield-to-maturity* as dependent variable)						
Cross-listing variables:						
PP	-0.104	-0.194	-0.487	-0.138	-0.187	-0.152
	(-0.40)	(-0.65)	(-1.42)	(-0.76)	(-0.89)	(-0.30)
OTC	-0.208	-0.096	-0.152	-0.172	-0.511*	-0.024
	(-1.59)	(-0.24)	(-0.59)	(-1.18)	(-1.71)	(-0.18)
EXCH	-0.423***	-0.233	-0.175	-0.467***	-0.035	-0.395**
	(-2.70)	(-0.68)	(-0.60)	(-2.95)	(-0.14)	(-2.43)
Bond-specific, firm-specific & macro-economic controls	included	included	included	included	included	included
Fixed effects	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y	C, I, Y
Adj. R^2	74.84%	45.30%	45.51%	75.31%	62.96%	75.79%
N	3,747	1,182	1,096	4,122	1,981	3,485

The sample comprises a maximum of 195,999 firm-year observations from 46 countries between 1992 and 2012, of which 5,467 have bond yield-to maturity data (see Table 1). We tabulate results separately for subsets of sample countries based on the binary partitioning variables outlined in Panel A. In Panel B, we report coefficient estimates and (in parentheses) *z*-statistics based on standard errors clustered by firm from probit regressions of debt financing on firms' cross-listing status and various controls. The dependent variable is *Bond issue* set equal to 1 if the firm undertakes a public or private bond offering. Model 1 from Table 3 serves as base specification. In Panel C, 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 controls. The dependent variable is the *Bond yield-to-maturity* measured at the time of issuance. Model 3 from Table 4, Panel A, serves as base specification. We only tabulate the main variables of interest. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.