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Global Corporate Debt during Crises

Implications of Switching Borrowing across Markets

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Abstract

This paper studies how crises prompted firms to switch borrowing across markets, impacting the amount borrowed, maturity, and currency denomination at the firm and aggregate levels. Using data on worldwide debt issuance from advanced and emerging economies, the paper shows that firms shifted their issuances between domestic and international syndicated loans and corporate bonds during financial crises. Firms reduced their borrowing in shock-hit markets but increased it in other debt markets. Firms also moved toward longer-term markets, maintaining (or even increasing) their borrowing maturity. As they moved toward domestic markets during international crises, firms reduced the share of foreign currency debt. The opposite occurred during domestic crises. Large firms were the ones that switched between international and domestic markets, affecting aggregate capital raising activity. The analysis of four distinct markets generates patterns consistent with credit supply shocks that are different from those obtained when studying the dynamics of individual markets.

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1. Introduction

The volume of corporate debt has rapidly expanded worldwide since the early 1990s, growing faster than equity financing and gross domestic product (GDP). This growth has occurred not only in one, but in several debt markets that have become key sources of external finance for corporations. Evidence from the United States shows that most publicly listed firms borrow simultaneously from banks and bond markets, with bonds accounting for about 63 percent of the total domestic debt outstanding by the non-financial sector (Rauh and Sufi, 2010; Crouzet, 2018). Among bank loans, syndicated lending has become the main alternative to bond markets, especially for large corporations (Ivashina and Scharfstein, 2010; Cerutti et al., 2015). The borrowing activity through bonds and syndicated loans has taken place in both domestic and international markets (Henderson et al., 2006; Hale, 2007; Gozzi et al., 2015; Claessens, 2016).

Researchers have exploited the corporate debt issuance data in different markets to document how publicly listed companies in the United States substituted domestically issued syndicated loans for bonds to withstand negative shocks to the supply of bank credit (Adrian et al., 2013; Becker and Ivashina, 2014). These papers build on the idea that domestic bond financing can replace domestic bank lending during banking crises, when capital markets might act as a "spare tire" (Greenspan, 1999; Levine et al., 2016). Other research highlights that different markets are not perfectly integrated and provide different types of financing, even for the same borrower (La Porta et al., 1997; Karolyi and Stulz, 2003; Pirinsky and Wang, 2006; Japelli and Pagano, 2008; Bekaert et al., 2011; Gozzi et al., 2015; Crouzet, 2018). Hence, changes in financing across markets during supply contractions can have important implications both for the amount of credit obtained and for other debt attributes.

In this paper, we expand the existing literature by studying whether firms from around the world reacted to well-known financial crises by switching across debt markets. We examine substitutions not only between domestic syndicated loans and domestic bonds, as the existing

literature does, but also between domestic and international markets. Cross-border issuances account for a sizeable share of worldwide borrowing through corporate bonds and syndicated loans (56 percent during 1991-2014). Then, we analyze how changes in debt issuance composition during crises impacted the total amount borrowed and the new terms of financing. We focus on maturity and currency denomination at the firm and aggregate (country) levels. Our analysis of a more complete set of debt markets across advanced and emerging economies yields different patterns on the dynamics of debt than those obtained by studies based on individual markets, individual economies, or balance sheet data. The differences in results point to the importance of analyzing jointly the various markets in which corporations borrow.

To conduct the analysis, we use debt issuance data at the transaction level for 50 different economies and four types of debt markets around the world: domestic and international (cross-border) corporate bonds and syndicated loans. Our sample comprises 56,826 (listed and unlisted) firms and 183,732 (domestic and cross-border) issuances during 1991-2014. We also expand existing analyses by covering the universe of non-financial firms (not just publicly listed corporations) issuing debt in these four debt markets. Unlisted firms are in fact significant in our sample of issuers: they account for 45 percent and 71 percent of the total number of firms issuing corporate bonds and syndicated loans, respectively. Lastly, we also consider different types of financial shocks to evaluate changes in debt issuance activity. We focus on the 2008-2009 Global Financial Crisis (GFC) as an international banking crisis and on domestic banking crises during 1991-2014.

Our main findings can be summarized as follows. First, firms moved away from crisis-hit markets during financial crises, changing their debt issuance composition. Firms switched both between bonds and syndicated loans and between domestic and international debt. The direction of the market switches varied with the crisis origin. When the GFC hit banks in major advanced economies, firms worldwide increased their propensity to issue (i) bonds relative to syndicated loans

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and (ii) domestic debt relative to international debt. In contrast, during domestic banking crises, firms increased their propensity to issue international debt relative to domestic debt, while also switching from syndicated loans to bonds. Cross-border issuances are key to find sizeable changes in debt composition across markets. For example, controlling for demand factors, the probability of emerging economy firms issuing domestic debt relative to international debt increased by 34 and 149 percent in bond and syndicated loan markets, respectively, in the aftermath of the GFC. During domestic banking crises, the probability of issuing international debt relative to domestic debt increased by about 25 percent in both bond and syndicated loan markets. Large firms were the ones that switched to/from international markets during crises, affecting the aggregate issuance patterns as they captured most of the borrowing activity in bond and syndicated loan markets.

Second, we show both empirically and in an analytical section that firms increased their borrowing in the debt markets not directly hit by the shock, while they borrowed less in the shock-hit markets. These patterns hold both within firms and at the economy-industry level. In some instances, these movements fully compensated each other, as the overall amount of debt issued remained at similar levels after crises relative to before. This was the case in emerging economies around the GFC, when the increase in domestic debt financing (through bonds and syndicated loans) offset the decline in cross-border debt issuances. In contrast, in advanced economies there was a decline in overall financing over the same period, as the increase in (mostly domestic) bond financing was smaller than the decline in capital raising through (international) syndicated loans. Our results for domestic banking crises show that the increase in cross-border debt issuances fully offset the decline in domestic debt issuances. In all three cases, bond financing gained prominence over syndicated loan financing.

Third, the maturity and currency denomination of newly issued debt changed as firms switched across debt markets during crises. Although the maturity of debt at issuance tends to decline in individual markets when crises erupt, our results considering all debt markets show stable overall debt

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maturities at issuance, both at the firm and at the economy-industry levels. This stability is due to movements away from crisis-hit markets toward longer-term markets. Whereas both the GFC and domestic banking crises had similar effects on overall debt maturities at issuance, they triggered opposite effects on the debt currency denomination. The movement toward domestic debt markets during the GFC translated into higher shares of debt denominated in domestic currency, especially for emerging economies. In contrast, the movement toward international debt during domestic banking crises was matched with higher shares of foreign currency debt issuances.

An auxiliary finding showing that debt issued in different markets carries distinct attributes in terms of issuance size, maturity, and currency denomination helps to explain the second and third main findings. Corporate bond issuances are on average smaller and of longer maturity than syndicated loans. Corporate bond issuances in advanced and emerging economies are 55 and 36 percent smaller than syndicated loans, but 5.4 and 1.3 years longer term. Moreover, cross-border debt issuances tend to be denominated in foreign currency, whereas domestic issuances are typically denominated in domestic currency. In emerging markets, 93 percent of cross-border debt issuances are denominated in foreign currency and 94 percent of domestic debt issuances are denominated in domestic currency. The differences in issuance size, maturity, and currency across debt markets hold even after controlling for firm-level and time-varying economy-industry fixed effects, suggesting that these differences are related to the market of issuance. Thus, if firms change markets, the debt attributes will also change.

The evidence in this paper contributes to at least four strands of the literature. First, as mentioned earlier, some papers show that listed firms in the United States substitute bonds for syndicated loans in domestic markets to withstand bank credit supply contractions (Kashyap et al., 1993; Adrian et al., 2013; Becker and Ivashina, 2014). Following a similar methodology than the existing research, we analyze a more complete set of debt markets (incorporating international markets), economies (both advanced and emerging), firms (listed and unlisted), and shocks (domestic

and international). Our results not only generalize the movement from syndicated loans to bonds during crises, but also provide important additional information. In particular, the direction of the market switches depends on the origin of the financial shock, which tends to occur in specific markets. During domestic banking crises, firms moved toward international markets. During the GFC, they moved in the opposite direction. Thus, the inclusion of international debt markets and more economies is key to better understand credit supply contractions and firm dynamics in an increasingly globalized financial system. If the analysis focused only on domestic issuances, we would not observe changes in debt issuance composition between bonds and loans around the world during crises. Moreover, by including all issuing firms, our analysis shows that firm switches across debt markets are not confined to listed firms. Unlisted firms too move both between bond and syndicated loan markets and between domestic and international markets, though to a lesser extent than listed firms do.

Second, our paper contributes to the literature that studies the effects of financial shocks on financing volumes when firms access different debt markets. This research builds on the idea that bond debt is more difficult to restructure than bank loans when firms are in financial distress. The dispersion of bond investors reduces their incentives to renegotiate debt payments relative to banks, which can monitor firms more closely and offer greater financial flexibility than bondholders (Bolton and Scharfstein, 1996; Chemmanur and Fulghieri, 1994; Bolton and Freixas, 2000; Hackbarth et al., 2007; Roberts and Sufi, 2009; Schwert, 2020). Theoretical models predict that some firms substitute bonds for loans during bank credit supply contractions, but when doing so they reduce the volume of debt issued relative to pre-crisis levels as a precautionary response to the increase in financial fragility associated with the higher share of bond financing (Crouzet, 2018).[1] These models suggest that bond

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[1] Related research shows that firms might also increase their cash holdings when moving from loan to bond financing (De Fiore and Uhlig, 2015; Xiao, 2018).

markets can act as imperfect substitutes for bank financing, because the increase in bond issuance during crisis periods would not fully compensate for the decline in bank lending.

Our analysis provides evidence consistent with these theories and expands the existing discussions by introducing an empirical design and an analytical framework where firms obtain financing in both domestic and international debt markets, using four different sources of external finance (instead of just bonds and syndicated loans). We find that the degree of compensation across markets during crises depends on the origin of the shock and on the extent to which alternative markets react. During the GFC, our results for advanced economies are consistent with imperfect substitutability between bonds and loans. Though firms markedly switched from syndicated loan to bond financing, the increase in bonds did not fully offset the decline in syndicated lending. Thus, we observe an overall decline in debt both within firms and at the economy-industry level. In contrast, we find full compensation in the other two cases we study. Our results show a stability in debt financing volumes for emerging economies during the GFC, where the increase in domestic bond and domestic syndicated loan issuances more than offset the decline in cross-border debt issuances. During domestic banking crises, the increase in cross-border syndicated loans and (domestic and cross-border) bonds fully counterbalanced the decline in domestic syndicated loans. The joint analysis of international and domestic debt is useful not just for the identification of credit contractions in specific debt markets, but also for a more complete characterization of the dynamics of debt financing at the firm and aggregate levels.

Third, this paper contributes to the literature on the dynamics of debt maturity around crises. Research shows that changes in market conditions during crises along with a deterioration in investors' expectations and increased risk aversion contribute to shortening debt maturities within individual debt markets (Erel et al., 2012; Chen et al., 2012; He and Milbradt, 2016; Mian and Santos, 2018). This shortening in debt maturities happens even when increased uncertainty during crises might induce

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debtors to borrow longer term to reduce refinancing risks (Graham and Harvey, 2001; Brunnermeier, 2009; Krishnamurthy, 2010; Almeida et al., 2011; He and Xiong, 2012; Broner et al., 2013; Diamond and He, 2014; Harford et al., 2014). The existing literature tends to draw its conclusions from analyses of individual debt markets, overlooking the effects of changes in debt issuance composition.[2]

Our results highlight that the overall debt maturity, at both the firm and aggregate levels, depends not only on how maturity evolves in individual markets, but also on the relative importance of each market. Consistent with the literature, we show that the maturity of debt at issuance tended to decline in individual markets during crises. But we also show that switches between debt markets typically lengthened the overall debt maturity, driven by the fact that firms issued bonds at longer maturities than syndicated loans. This finding is consistent with the notion in the literature that banks offer more financial flexibility to firms in terms of renegotiation. Thus, when moving from bank credit to bonds, firms might try to lengthen maturities to avoid the higher refinancing risks of bonds.

Fourth, this paper contributes to research on the determinants of foreign currency debt, where the arguments are similar to those on debt maturity, with both demand and supply factors playing a role. Firms try to limit the risks associated with exchange rate movements by matching the currency denomination of their earnings with that of their debt obligations (Graham and Harvey, 2001; Servaes and Tufano, 2006). In the extreme case of market segmentation, emerging market borrowers have limited availability of local currency financing in international markets, also known as "original sin" (Eichengreen and Hausmann, 1999; Hausmann and Panizza 2011; Hale et al., 2016). During crises, currency risks tend to increase, as local currencies tend to depreciate. Borrowers might want to reduce

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[2] Other papers document a shortening of the maturity structure in firms' balance sheets, which consider short-term debt (under one year in maturity) and long-term debt (over one year) (Gonzalez, 2015; Demirgüç-Kunt et al., 2020). However, these analyses cannot distinguish between firms not issuing during crises (hence, shortening the maturity structure of the existing debt) or the new debt issued during crises being shorter term. In contrast, issuance data allow us to study the behavior of the maturity of new debt.

their exposure to such risks by turning to local currency debt, while investors become more reluctant to lend in domestic currency and demand a higher risk premium to do so (Arteta and Hale, 2008; Hale and Arteta, 2009). Although the empirical literature on the dynamics of the currency composition of debt during crises is limited, the case of Mexico in 1994-95 shows that the government responded at the onset of the crisis by converting local currency debt falling due into foreign currency debt to attract investors (Sachs et al., 1996). Similar movements from local currency to foreign currency assets took place in the banking systems of Argentina and Uruguay in 2001 (Levy Yeyati et al., 2010).

We contribute to this literature by showing that the overall share of foreign currency debt depends not only on individual market conditions, but also on the relative importance of each market for firm financing. In other words, the direction of debt market switches during crises play an important role in the overall currency composition of newly issued debt, at both the firm and aggregate levels. Our results show that crises originated abroad tended to translate into a greater share of domestic currency financing as firms switched away from international to domestic markets. The opposite occurred during domestic banking crises. These findings suggest that domestic and international debt markets are imperfect substitutes in terms of the currency denomination of debt. Although firms tend to raise foreign currency debt in foreign markets, to the extent that they also use domestic financing, they can mitigate the foreign currency exposure associated with international debt by borrowing at home.

The remainder of the paper is organized as follows. Section 2 describes the data and methodology. Section 3 studies changes in debt issuance composition during crises. Section 4 studies the differences in debt attributes across markets. Section 5 investigates the impact of crises on the total volume and terms of financing. Section 6 presents a conceptual framework to analyze switches across markets and their implications. Section 7 concludes.

2. Data

To analyze issuance activity around the world, we use comprehensive, transaction-level data on corporate bonds and syndicated loans issued in domestic and international markets between 1991 and 2014. The data come from Refinitiv's (previously Thomson Reuters') Security Data Corporation (SDC) Platinum, which provides information on the issuance characteristics of publicly and privately placed bonds and syndicated loans.[3] We focus the analysis on the non-financial corporate sector and exclude financial sector issuances (those conducted by firms with a Standard Industrial Classification or SIC code between 6,000 and 6,800).[4] We also exclude asset-backed issuances and public-sector issuances, comprising issuances by national, local, and regional governments, government agencies, regional agencies, and multilateral organizations. Moreover, we exclude economies considered to be offshore financial centers.[5] To estimate the amount raised per issuance in each market, we aggregate transactions per firm at the daily level, such that issuances with different tranches within the same market are considered single issuances. We use information on issuances of common and preferred equity to compare the size of debt markets. All reported values are in constant 2011 U.S. dollars.

The data we use for the paper consist of 56,826 listed and unlisted non-financial firms and 184,496 daily debt issuances: 84,761 bond issuances and 99,735 syndicated loan issuances (Table 1). We organize the data as an unbalanced firm-level panel of daily observations with positive issuances during 1991-2014. Days with no issuance for any given firm—that is, with no demand for credit—are not included in the sample.

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[3] SDC Platinum is one of the most widely used databases on research exploring transaction-level issuance data. Some prominent studies such as Henderson et al. (2006), Kim and Weisbach (2008), and Bruno and Shin (2017) use the same database.

[4] We divide non-financial industries across eight main categories by using the first digit of the Standard Industrial Classification (SIC) codes: agriculture, forestry, and finishing; mining; construction; manufacturing; transportation and utilities; wholesale trade; retail trade; and services.

[5] We use the list of offshore financial centers as defined by the IMF.

The data include issuances conducted by both publicly listed firms and unlisted firms, with the latter representing almost half (45 percent) of the bond issuers and most (71 percent) of the syndicated loan issuers. This significantly expands our data coverage relative to the approach used by the existing literature, which focuses both on listed firms (arguing that those are the ones more able to access debt markets and switch across them) and on issuers that more frequently use bond markets. For instance, Becker and Ivashina (2014) restrict their analysis to listed firms that issued bonds in the last five years of their sample. We do not restrict our sample of firms because: (i) we study four types of debt markets (instead of two as the literature does), so we do not want to impose strict conditions on firms having issued in a particular set of markets, and (ii) we are interested in aggregate effects caused by all switches in our sample. Our expanded sample of firms allows us to better capture different types of changes in issuance composition over time and their aggregate implications.

To study issuance activity in different markets, we distinguish between debt instruments (bonds and syndicated loans) and between issuance locations (domestic and international markets). Syndicated loans allow us to study switches across debt markets because they are arguably the main substitute for corporate bond financing and an important source of bank lending (Blaise, 2004; Haselmann and Wachtel, 2011; Bruche et al., 2017). These types of loans are typically composed of several tranches from different financial institutions, allowing banks to diversify risk and firms to borrow larger amounts than through traditional loans (Ivashina and Scharfstein, 2010; Benmelech et al., 2012; Cerutti et al., 2015).

We classify corporate bond issuances as domestic or cross-border using the residence-based approach followed by the Bank of International Settlements (BIS). We compare the location of the issuance with the residence of the issuing firm (Gruić and Wooldridge, 2012). Domestic securities are those issued by residents in their local markets. Cross-border issuances are those issued by residents

abroad. The data set includes 63,767 domestic bond issuances and 20,994 cross-border bond issuances.

The literature on international banking typically compares the residence of banks and borrowers to distinguish between domestic and cross-border lending (Claessens, 2016; World Bank, 2018). The case of syndicated loans is not as straightforward because they can involve several financial institutions, both domestic and/or foreign ones. We follow Haselmann and Wachtel (2011) and compare the residence of the lead bank arranging the deal with the residence of the borrower to distinguish between domestic and cross-border syndicated loan issuances. The lead arranger establishes and maintains the relationship with the borrower, negotiates the terms of the loan, monitors compliance, and holds the largest share of the loan (Sufi, 2007; Haselmann and Wachtel, 2011; Bruche et al., 2017). Therefore, we define domestic loans as those with only domestic banks leading the syndication, whereas cross-border syndicated loans entail the participation of foreign banks as lead arrangers. The data set includes 56,589 domestic syndicated loans and 43,146 cross-border syndicated loans. For robustness, we considered two alternative definitions of cross-border syndicated lending: (i) when only foreign banks participate in the deal; or (ii) when more than half of the banks that participate in the deal are foreign. The results were robust to the ones reported in the paper.

To examine changes in debt issuance activity around crises, we focus on the GFC and domestic banking crises. The effects of the GFC were arguably different for advanced and emerging economies because (i) the crisis originated in advanced economies and (ii) advanced economies are more financially connected among themselves than with emerging economies (Claessens et al., 2010; Eichengreen, 2010; Didier et al., 2012). Therefore, for the purpose of studying the effects of the GFC, we classify economies as either advanced or emerging.[6] The final data set comprises 50 economies, 30

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[6] We follow the World Bank classification of countries as of 2012: advanced economies are those with a gross national income (GNI) per capita in 2011 above $12,476. All other economies are classified as emerging.

advanced and 20 emerging. Appendix Table 1 reports the list of economies, the number of debt issuances, and the number of firms per economy. The main results of this paper are robust to the exclusion of the largest advanced and emerging economies (the United States and China).

To study domestic banking crises, we merge our data on corporate debt issuances with data from the Reinhart and Rogoff's financial crises database, which covers the 1991-2014 period. In their database, domestic banking crisis years are marked by two types of events: (i) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; and (ii) no runs, but the closure, merging, takeover, or large-scale government assistance of an important financial institution that marks the start of a string of similar outcomes for other financial institutions.[7] After merging the data sets, we obtain a sample that comprises 170,947 debt issuances conducted by 51,989 firms from 36 economies. We do not split the sample across groups of economies when analyzing domestic banking crises for three main reasons: (i) domestic banking crises consist of relatively similar events across economies; (ii) our sample of economies is smaller when merging the domestic crises data; and (iii) most of the domestic banking crises in emerging economies occurred during the 1990s, when the corporate debt issuance activity by this group of economies was scarcer.

3. Changes in Debt Issuance Composition during Crises

The primary debt markets we analyze in this paper have rapidly expanded worldwide since the early 1990s (Figure 1). Between 1991 and 2014, the total amount of corporate bonds and syndicated loans issued increased more than 7-fold in advanced economies and almost 27-fold in emerging economies, reaching $4.6 trillion and $0.81 trillion in 2014, respectively. The growth in debt issuance activity

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[7] The authors of the database acknowledge the difficulty in accurately pinpointing the year in which a crisis ended. For robustness, we also analyzed the Leaven and Valencia (2012) database on banking crises. The results were qualitatively similar to the ones reported in this paper.

during 1991-2014 was 5 times faster than the growth in GDP and 3 times faster than the growth in equity financing in our sample of advanced and emerging economies.[8]

3.1 Aggregate Patterns

The aggregate expansion in debt (bond and syndicated loan) issuance activity temporarily halted during 2008-2009, when the GFC hit the banking sector of major advanced economies and rapidly spread throughout the global financial system. The annual growth in debt issuance fell by 21 percent and 4 percent between 2007 and 2008-2009 in advanced and emerging economies, respectively. Although international banks were at the core of the crisis, this unique shock was exogenous to most economies and firms (Almeida et al., 2011).

In addition to the overall decline in financing, the composition of debt issuances shifted between debt instruments (bonds and syndicated loans) and between issuance locations (domestic and international markets). Specifically, newly issued corporate debt shifted away from syndicated loans toward bonds. The share of bond issuances over total debt issuances (bonds plus syndicated loans) increased by 62 and 36 percent in advanced and emerging economies between 2005-2007 and 2008-2009 (Figure 2, Panel A). The composition of corporate debt issuances also shifted from international to domestic markets over the same period, especially in emerging economies. The share of domestic bond over total bond issuances increased by 7 and 63 percent in advanced and emerging economies (Figure 2, Panel B). The share of domestic syndicated loan over total syndicated loan issuances increased by 17 and 150 percent in advanced and emerging economies (Figure 2, Panel C).

During domestic banking crises, the composition of debt issuances also changed between debt instruments and between issuance locations. Akin to the changes during the GFC, the relative

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[8] Corporate bond financing has typically grown faster than bank credit during the same period (Abraham et al., 2019).

importance of bond financing increased. The share of bond issuances over total debt issuances increased by 12 percent during domestic crises relative to non-crisis periods (Figure 2, Panel A). However, in contrast with the patterns around the GFC, the share of international (rather than domestic) debt increased. The share of cross-border bonds and syndicated loans increased by 3 and 11 percent, respectively, during domestic banking crises (Figure 2, Panels B and C).

3.2 Firm-level Evidence

To study whether the aggregate patterns presented above are driven by within-firm market substitutions, compositional changes in the set of firms raising new debt, or both, we follow Adrian et al. (2013) and Becker and Ivashina (2014). That is, we examine firms' decisions between instruments issued and between issuance locations in a discrete choice framework.[9] Because the analysis is based on the set of firms with a revealed demand for credit, shifts away from markets affected by crises toward alternative ones would be consistent with a negative credit supply shock in the former.

We estimate discrete choice logit models focusing on firms' decisions to issue bonds vis-à-vis syndicated loans and domestic vis-à-vis cross-border debt. We narrow the analysis to a five-year window around the GFC, comparing firms' financing decisions during the pre-crisis years (2005-2007) with the crisis years (2008-2009).[10] For domestic banking crises, we estimate similar discrete choice logit models comparing crisis and non-crisis periods.[11] We estimate one set of regressions for the

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[9] Using a similar methodology, Kashyap et al. (1993) study firms' movements between loans and bonds to provide evidence of a loan-supply channel of monetary policy transmission.

[10] Although the United States and other advanced economies started to show increasing levels of financial stress in the fourth quarter of 2007, it was not until third quarter of 2008 that the crisis spread among a wider set of countries (Claessens et al., 2010). We alternatively used a seven-year window around the GFC (2003-2009), obtaining qualitatively similar results to the ones reported in the paper.

[11] We do not use windows around domestic banking crises because the duration and frequency of crises vary greatly across economies, making it difficult to establish a fixed window around them.

choice between bonds and syndicated loans and another one for the choice between domestic and international debt. The regression equation is as follows:

$$D_{it} = \beta Crisis_{ct} + \theta + e_{it}. \tag{1}$$

The dependent variables are, alternatively: (i) a debt choice indicator D_{it} that equals one if firm i issued a bond (zero if it issued a syndicated loan) in day t; and (ii) a debt choice indicator D_{it} that equals one if firm i issued a given instrument domestically (zero if it issued the same instrument in international markets) in day t. The $Crisis_{ct}$ indicator variable captures the crisis periods: the 2008-2009 period for the GFC or the economy-crisis years as identified by Reinhart and Rogoff's financial crises database for domestic banking crises. The regressions also include different fixed effects, θ, that represent either economy-industry fixed effects θ_{ej} (to estimate aggregate changes in debt issuances within industries and economies) or firm fixed effects θ_i (to estimate changes within firms).[12]

The use of firm fixed effects in some specifications addresses the concern about compositional changes in the set of firms raising new debt financing and is key for the identification of market specific credit supply contractions. In these regressions, the sign and magnitude of our coefficient of interest, β, are derived from the firms actually switching debt issuances during crises. Firms with a single issuance do not add identification power to the estimation. Because the regressions also include firms always issuing the same type of debt (not switching markets), the coefficient β is smaller than it would be if we used only switching firms. Thus, our reported results based on the full sample of firms should be viewed somehow as lower bound estimates. The regressions with economy-industry fixed effects estimate whether aggregate movements across debt markets during crises (capturing issuances both within and across firms) go in the same direction as those within firms.

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[12] Standard errors are clustered at the economy-industry-quarter level in all regressions reported in this paper.

The results show that the issuance of bonds relative to syndicated loans increased during the GFC (Table 2, Panel A). Controlling for economy-industry fixed effects, the propensity to issue bonds relative to syndicated loans increased during 2008-2009 by around 6 percentage points (p.p.) in advanced economies (from a baseline probability of 28 percent during 2005-2007) and by 9 p.p. in emerging economies (from a baseline of 52 percent). The movement from syndicated loan to bond financing also took place within firms, indicating that the observed patterns are not solely driven by different firms issuing different types of debt at different points in time. Conditional on obtaining new debt financing, the probability of issuing bonds relative to syndicated loans increased during 2008-2009 (relative to 2005-2007) by 8 p.p. and 19 p.p. for firms in advanced economies and emerging economies. These changes during the GFC implied a 29 and 36 percent increase over the pre-crisis probability of issuing bonds instead of syndicated loans in advanced and emerging economies, respectively.

The logit regression estimates also show an increase in the use of domestic debt markets relative to international ones during the GFC, especially for emerging economy firms (Table 2, Panels B and C). The results hold after controlling for either economy-industry or firm fixed effects, indicating that the aggregate patterns are not entirely driven by shifts in the composition of issuing firms. For example, the probability that firms in advanced economies borrowed domestically, conditional on them raising new debt, increased by 8 p.p. (25 percent) within bond markets and by 5 p.p. (13 percent) within syndicate loan markets during the GFC relative to the pre-crisis period. In emerging economies, the probability of borrowing debt domestically increased by 25 p.p. (34 percent) within bond markets and by 28 p.p. (149 percent) within syndicated loan markets.

These results are consistent with a contraction in the supply of international bank credit during the GFC, as firms with an actual demand for credit (positive issuance) turned to domestic markets

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(especially domestic bond markets).[13] These movements were significantly more pronounced for firms in emerging economies than for firms in advanced economies. Importantly, if the analysis focused only on domestic issuances, there would be no significant changes in debt issuance composition between bonds and syndicated loans around the world during the GFC (Appendix Table 2). In unreported results for the United States, we did find a substitution within domestic markets, as the existing literature documents. The findings in this paper also highlight the importance of including both domestic and international debt markets when studying the dynamic patterns of issuance composition across countries.

The logit estimates for domestic banking crises show firms increasing their issuance (i) of bonds relative to syndicated loans and (ii) in international markets relative to domestic markets, when comparing crisis to non-crisis periods (Table 3, Panel A). These patterns hold both at the aggregate and firm levels. For example, the propensity to issue bonds increased by 14 p.p. during domestic crises from a baseline probability of 50 percent, implying a 29 percent increase relative to non-crisis periods. Moreover, conditional on firms issuing debt, the probability of borrowing through international (instead of domestic) markets increased by 26 and 25 percent for bonds and syndicated loans, respectively (Table 3, Panel B and C). Provided that domestic banking crises hit local financial systems, our results are consistent with firms moving from domestic to international debt markets (especially international bond markets) to mitigate contractions in the supply of domestic bank credit.

Because some economies experienced domestic banking crises during the GFC years (2008-2009), we conduct two robustness estimations by running the same regression on two different subsamples. First, we exclude the years 2008 and 2009 from the analysis. Second, we exclude

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[13] This finding is consistent with the notion that global banks were at the core of the GFC and, thus, their international linkages helped to propagate the crisis around the world (Kalemli-Ozcan et al., 2013).

economies that experienced a domestic banking crisis during the GFC period.[14] Both set of results provide larger point estimates of the switches between syndicated loans and bonds and between domestic and cross-border loans during domestic banking crises (Table 3).

To explore the idea in the literature that listed firms are the ones that are more able to switch across debt markets during credit supply contractions, we re-run the main two sets of logit regressions described above but splitting our sample between firms that are listed in stock exchanges and those that are not (unlisted). The estimates show that switches across debt markets are not confined to listed firms. Unlisted firms too switched their issuance composition during financial crises, though generally to a lesser extent than listed firms did (Appendix Table 3). The estimates for the within-firm switch from syndicated loans to bonds during the GFC in advanced economies are similar for listed and unlisted firms. The estimates for emerging economies are actually higher for unlisted firms than for listed ones, albeit they increase from a lower baseline probability. But in both cases the number of unlisted firms switching across debt instruments is significantly lower than that of listed firms. Moreover, the magnitudes of the estimates in the regressions for domestic banking crises are significantly lower for unlisted than for listed firms (Appendix Table 4). Therefore, estimates drawn from listed firms can be interpreted as an upper bound of the overall firm movements across debt markets during financial crises.

The contrasting results on debt market switches during the GFC vis-à-vis domestic banking crises highlight that the direction of such switches depends on the origin of the financial shock, which tends to occur in specific debt markets. When the GFC hit banks in major advanced economies, firms worldwide increased their propensity to issue bonds relative to syndicated loans and domestic debt relative to international debt. In contrast, during domestic banking crises, firms increased their

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[14] Nine economies in our sample experienced domestic banking crises during the GFC: Iceland, Ireland Rep., Netherlands, Portugal, the Russian Federation, Spain, Switzerland, the United Kingdom, and the United States.

propensity to issue international debt relative to domestic debt, while also switching from syndicated loans to bonds.

Our within-firm results show that the aggregate changes in borrowing composition across markets are not simply driven by different firms issuing debt in non-crisis and crisis periods. Large firms borrowing both domestically and abroad were the ones that switched the market of issuance across borders during crises. These switching firms are about six times larger than firms that issued only in domestic markets, and they are as large as firms that issued only in international markets around crises (Table 4, Panel A). Moreover, switching firms captured most of the issuance activity during crisis periods (Table 4, Panel B). These patterns are consistent with the empirical evidence in the literature showing that firms that issue in international markets are generally larger than firms that borrow only domestically, perhaps because of large fixed costs associated with access to international markets (Pagano et al., 2002; Claessens and Schmukler, 2007). The median size of international issuers in our sample (defined as firms that issued debt abroad at least once over 1991-2014) is more than five times the median size of domestic issuers.[15] International issuers constituted 47 percent of all firms and captured about 87 percent of the total amount of debt raised during 1991-2014. Among domestic issuers, only about 5 percent of them issued both domestic bonds and domestic syndicated loans over the sample period.

4. Differences across Debt Markets

Following the literature that argues that credit markets are not perfectly integrated along different dimensions, we next document the extent to which debt attributes vary across issuance markets. We focus on the amount of credit obtained (amount raised per issuance), debt maturity, and currency

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[15] We did not find significant differences in firm size when splitting firms between bond and syndicated loan issuers.

denomination. Rather than being exhaustive, we report the most relevant comparisons for our analysis of debt issuance composition during the GFC and domestic banking crises.

Aggregate statistics indicate that debt issuances carry different attributes depending on the market firms use to raise capital (Table 5). When comparing debt instruments, bonds have typically smaller issuance sizes, but are issued at longer maturities than syndicated loans. In advanced economies, bond issuances are on average 42 percent smaller and 5.3 years longer term than syndicated loan issuances. In emerging economies, bond issuances are on average 32 percent smaller than syndicated loans, but the average maturity of both instruments is similar. When comparing issuance locations, international debt is more likely to be denominated in foreign currency than domestic debt, especially in emerging economies. In advanced economies, about 5 and 3 percent of the total domestic bond and syndicated loan issuances are denominated in foreign currency, whereas 42 and 19 percent of cross-border bond and syndicated loan issuances are denominated in foreign currency. The correlation between issuance location and currency denomination is significantly higher for emerging economies. Foreign currency debt issuances by emerging economies account for about 6 percent of the issuances in domestic markets, but for about 93 percent of the cross-border issuances.

To formally assess the statistical significance of the differences in issuance attributes across the four types of debt, we regress the debt attributes of daily debt issuances (transaction size, maturity, and currency denomination) on different dummy variables for cross-border syndicated loans, domestic bonds, and cross-border bonds, where domestic syndicated loans are the omitted market (Table 6, Panel A). In two additional sets of regressions, we estimate the overall differences in issuance attributes between (i) bonds and syndicated loans and (ii) domestic and international debt (Table 6, Panel B). All regressions include economy-industry-quarter dummies and firm fixed effects to assess

whether issuance attributes consistently vary across debt markets, even when issuances are conducted by the same firms.[16]

The results confirm that firms from advanced economies obtain lower issuance amounts but longer debt maturities when issuing corporate bonds instead of syndicated loans. Corporate bond issuances are 55 percent smaller, but 5.4 years longer term than syndicated loans. Although there are some differences across locations, both domestic and cross-border bond issuances are on average smaller (by at least 34 percent) and longer term (by at least 4 years) than domestic and cross-border syndicated loans. These patterns are consistent with the claims in the literature that, compared to bonds, loan financing allows firms to raise large amounts on short notice, are more closely monitored, and are easier to renegotiate. These differences in debt attributes across markets suggest that, *ceteris paribus*, changes in issuance composition from syndicated loan to bond financing during bank credit supply contractions would translate into lower issuance amounts, but longer debt maturities for advanced economies.

The regression estimates for emerging economies show similar patterns, albeit with smaller magnitudes. Corporate bonds typically have smaller issuance sizes and longer maturities than syndicated loans. Firms raise about 36 percent less capital through bonds than through syndicated loans. But they borrow on average 1.3 years longer term when they issue bonds vis-à-vis syndicated loans. These aggregate differences in debt maturity for emerging economies vary across issuance locations. Domestic syndicated loans are about 2 years longer term than cross-border syndicated loans,

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[16] To ensure the differences in debt attributes across markets are not driven by switches across markets during crises (due to firms simultaneously changing attributes and markets), we re-ran all regressions excluding the GFC period and domestic banking crises years. The results were almost identical to the ones shown in this section.

while domestic bonds are about 2 years shorter term than cross-border bonds.[17] These differences in debt attributes across markets suggest that, *ceteris paribus*, a shift in issuance composition from international to domestic markets during international credit supply contractions would translate into longer maturities within syndicated loans, but shorter maturities within corporate bonds for emerging economies. Akin to the patterns observed for advanced economies, an overall shift from syndicated loan to bond financing for emerging economies would translate into lower issuance amounts, but longer debt maturities.

Regarding the currency denomination of debt, the results show a strong dependence on the issuance location. This is markedly the case for firms in emerging economies, where cross-border debt issuances tend to be denominated in foreign currency, whereas domestic issuances are typically denominated in domestic currency. For example, the propensity to issue foreign currency debt increases by 13 p.p. and 74 p.p. when advanced and emerging economy firms issue international debt instead of domestic debt.[18] Hence, as firms switch between domestic and international debt markets, the currency denomination of newly issued debt will likely change. This finding is consistent with a limited ability of emerging market firms to borrow in local currency in international markets (Eichengreen and Hausmann, 1999; Hausmann and Panizza, 2011; Hale et al., 2016).

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[17] These patterns are consistent with existing research. Greater reputation associated with cross-border issuances and other financial frictions can play a role in explaining why cross-border bond issuances tend to be longer term than domestic bond issuances in emerging economies (Gozzi et al., 2015). While corporate bond financing is typically conducted at arm's length, syndicated loan financing relies on relationship lending. These loans are mostly used by unrated firms, which are then closely monitored by the lead arrangers to ensure compliance (Benmelech et al., 2012). The distance between borrowers and lenders can affect the contract structure of syndicated loans, as longer distances imply higher monitoring costs and greater information asymmetries and perceived risks (Sufi, 2007). For emerging economies, more than 60 percent of the cross-border syndicated loans are originated by banks in Europe and the United States. Hence, our finding that domestic syndicated loans are longer term than cross-border loans is consistent with the idea that domestic loans might be easier to monitor than cross-border loans, allowing for longer maturity contracts.

[18] The estimates for advanced economies remain mostly unchanged when excluding the Eurozone economies (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain).

5. Changes in Debt Attributes during Crises

Next, we connect the two main findings documented above (that firms with demand for credit switched debt markets during crises and that debt characteristics systematically vary across markets) to analyze the effects of those switches on debt issuances. We study first whether the switches across markets offset (in terms of amount raised) the decline in financing in certain markets. Then, we study how debt maturity and currency denomination changed during crises within and across debt markets (total debt). We report the findings first for the GFC, separately for advanced and emerging economies, and then for domestic banking crises.

To study the issuance activity around the GFC, we estimate regressions similar to the logit analysis used earlier. We focus on the five-year window period around the GFC: the pre-crisis period (2005-2007) and the crisis period (2008-2009). For the analysis of domestic banking crises, we consider the complete 1991-2014 period and follow the definition of crisis and non-crisis years described in the previous sections. We run separate regressions for each debt market individually and for total debt by restricting our data to: (i) domestic bonds, (ii) cross-border bonds, (iii) total bonds (domestic + cross-border bonds), (iv) domestic syndicated loans, (v) cross-border syndicated loans, (vi) total syndicated loans (domestic + cross-border loans), (vii) total domestic debt (domestic bonds + domestic loans), (viii) total cross-border debt (cross-border bonds + cross-border loans), and (ix) total debt (which aggregates all types of debt). The estimations for total debt capture changes both within and across markets.

We estimate the following regression specification for each debt market defined above:[19]

$$Attribute_{it} = \beta Crisis_{ct} + \theta + e_{it}. \tag{2}$$

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[19] The methodology is similar to that used by Khwaja and Mian (2008), who study the transmission of bank liquidity shocks to the real economy using the amount of bank credit.

The dependent variable *Attribute$_{it}$* is, alternatively, (i) the log (1+amount raised) by firm i in quarter t; (ii) the (weighted average) maturity of newly-issued debt for firm i in quarter t; (iii) the share of new foreign currency debt in total new debt for firm i in quarter t.[20] We measure these attributes for each debt market defined above. The independent variable *Crisis$_{ct}$* indicates crisis periods: the 2008-2009 period for the GFC and the domestic banking crisis years. The regressions also include fixed effects, θ, which represent either economy-industry fixed effects (θ_{cj}) or firm fixed effects (θ_i). We also include time (quarter) fixed effects (θ_t) in the regressions for domestic banking crises, but do not do so in the regressions for the GFC due to perfect collinearity with the crisis variable.

In the regressions with the log (1+amount raised) as dependent variable, the coefficient β estimates changes in issuance size within markets and across markets (total debt). The regressions exclude all firm-quarter observations without any debt issuance activity in any market, capturing changes in issuance size conditional on issuance. Hence, the dependent variable in the total debt regressions (which accumulate issuances across markets) has only positive values. But the dependent variable in the individual debt market regressions can be either positive or zero, depending on whether a firm raised debt or not in that market in that quarter. For robustness, we estimated these regressions on a balanced sample constructed by assigning zeros to all economy-industry quarters without any issuance activity. The results were qualitatively similar to the ones reported in the paper.

In the regressions for debt maturity and currency denomination, the coefficient of interest, β, captures changes in these attributes during crises within and across markets (total debt). The dependent variable (debt maturity or share of foreign currency debt) is only defined in the debt markets with a new issuance at the firm-quarter level. It has missing values (instead of zeros) for the

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[20] We collapse the data in this section at the firm-quarter level (instead of firm-day) to account for the possibility that some firms conducted several issuances within the same quarter.

markets where the firm did not issue debt. These regressions are computed with weighted least squares to take into account that the amount borrowed changed during crises and that larger amounts have a larger effect on firm and aggregate financing. The weights are the amount of debt raised per quarter. For these regressions, we drop the top 1 percent of the issuances based on issuance size to ensure that our results are not driven by outliers.

5.1. The Global Financial Crisis: Advanced Economies

The aggregate trends indicate that, as the GFC hit banks in major advanced economies, firms moved toward alternative debt markets. As the increase in bond financing was smaller than the decline in capital raising through syndicated loans, total debt financing declined (Figure 3, Panel A).

The regression estimates confirm these aggregate patterns (Table 7). Although firms markedly switched from syndicated loan to bond financing, the increase in bonds did not fully offset the decline in syndicated loan financing. This result is consistent with an imperfect substitutability between bonds and syndicated loans.

The estimations show an overall decline in total debt financing both at the economy-industry level and at the firm level. Specifically, whereas the quarterly amount of debt raised through cross-border syndicated loans declined by 43 percent during the GFC vis-à-vis the pre-crisis period (the issuance of domestic loans was statistically unchanged), debt raised through domestic and cross-border bonds increased by 22 and 8 percent. These changes implied an increase of 29 percent in total bond issuances (mainly driven by the increase in domestic bonds) and a decline of 44 percent in total syndicated loan issuances (driven by the decline in cross-border loans). Because the increase in bond issuances was mostly domestic while the decline in loan issuances was only cross-border, the regressions also show an overall increase of 20 percent in total domestic debt issuances and a decline of 34 percent in total cross-border debt issuances. The total amount of debt borrowed during the

GFC declined by 13 percent. Firms raising debt before and during the GFC lowered their issuances by about 7 percent during the crisis (Table 7, last column).[21]

The switches across debt markets during the GFC affected the maturity and currency denomination of newly issued debt. While the maturity of debt declined within bond and syndicated loan markets, the total debt maturity issued remained relatively stable during the GFC (Figure 3, Panel B). This stability in aggregate debt maturity is due to movements away from the crisis-hit syndicated loan markets toward (longer-term) bond markets. The regression results show that the maturity of corporate bonds and syndicated loans shortened (both domestically and abroad) by around 2 years and 1 year, respectively, during the GFC relative to the pre-crisis period (Table 8, Panel A). In contrast, the total debt maturity shortened by only 0.36 years at the economy-industry level and, in fact, remained stable within firms. Moreover, the increased importance of domestic bond financing during the GFC implied more domestic currency bond financing. The regression estimates show that the share of domestic currency bonds increased by 3 p.p. during the GFC period (Table 8, Panel B).

5.2. The Global Financial Crisis: Emerging Economies

In emerging economies, the overall volume of corporate bond financing increased during the GFC relative to the pre-crisis years, while syndicated loan financing declined (Figure 4, Panel A). At the aggregate, these movements fully compensated each other, as the overall amount of debt issued remained at similar levels during the GFC relative to before.

The regression estimates indicate that the firms' movement from international toward domestic markets helps to explain the aggregate shift from syndicated loan to bond financing during

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[21] Appendix Table 5 shows the same regressions with firm fixed effects in every column (instead of economy-industry fixed effects). The point estimates and magnitudes are similar to the ones reported by the regressions with economy-industry fixed effects.

the GFC (Table 9). Whereas the amount of cross-border bonds and cross-border syndicated loans per firm-quarter declined by 67 percent and 34 percent during the GFC relative to the pre-crisis years, debt issued through domestic bonds and domestic syndicated loans increased by 74 percent and 38 percent, respectively. Because cross-border syndicated loans witnessed the largest decline in financing while domestic bonds saw the largest increase, the aggregate patterns show a switch from syndicate loan to bond financing. In contrast with the patterns for advanced economies, the results for emerging economies show a stability in debt financing both at the economy-industry level and within firms, explained by the movement toward domestic debt financing that fully offset the decline in cross-border issuances.

Debt maturity also changed as firms switched across debt markets during the GFC. The movement from international toward longer-term domestic debt explains the observed longer syndicated loan maturities, as debt maturities remained relatively stable within each of these syndicated loan markets. But the overall debt maturity at issuance remained stable because bond maturities tended to decline. In particular, the average maturity of bonds shortened by about 2.5 years during the GFC, whereas that of syndicated loans lengthened by about 3 years (Figure 4, Panel B). The total debt maturity remained relatively stable during the GFC relative to the pre-crisis period both at the economy-industry level and within firms, while the maturity of bonds and syndicated loans moved in opposite directions (Table 10, Panel A).

The movement away from international toward domestic debt markets during the GFC also translated into higher shares of debt denominated in domestic currency (Figure 4, Panel C). The regression results show a statistically significant decline of 22 p.p. in foreign currency debt financing during the GFC relative to the pre-crisis period (Table 10, Panel B). The results show a similar decline (of about 17 p.p.) for firms that raised debt before and during the GFC. The increase in domestic

currency bond financing is driven by firms switching from international to domestic bond markets, as the share of foreign currency debt financing within each market did not change.[22]

5.3. Domestic Banking Crises

As in the case of the GFC, compositional changes in debt financing during domestic banking crises also affected the overall volume of debt raised and other debt attributes. Firms increased their borrowing in the debt markets not directly hit by the financial shocks, while they borrowed less in shock-hit markets (the domestic syndicated loan markets). While financing volumes declined in local syndicated loan markets, they increased in all the other debt markets (Table 11). The amount raised per firm-quarter through domestic syndicated loan issuances declined by 68 percent during domestic banking crises relative to non-crisis periods. In contrast, the amount issued through domestic bonds, cross-border bonds, and cross-border syndicated loans increased by 18 percent, 32 percent, and 27 percent, respectively. These changes in issuance composition fully offset the decline in domestic loan issuances, with the overall debt financing increasing by about 11 percent at the economy-industry level and remaining stable at the firm level.

Whereas both the GFC and domestic banking crises had similar effects on overall debt maturities, they triggered opposite effects on the debt currency denomination. Regarding overall debt issuance maturity, there was a statistically significant increase (albeit relatively small, of about 0.2 years) during periods of domestic banking crises relative to non-crisis periods, both at the economy-industry level and within firms (Table 12, Panel A). These results stand in contrast with the results obtained for each individual debt market, where debt maturities at issuance either declined or remained

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[22] Within syndicated loan markets, the currency effects associated with switches from international to domestic markets are harder to disentangle because the share of domestic currency financing increased within both domestic and cross-border syndicated loan issuances.

unchanged. Market switches underpin again the overall changes in debt attributes. In this instance, the increase in debt maturity can be explained by the shift toward the longer-term bond financing, away from the shorter-term syndicated loan financing. The share of foreign currency financing increased during domestic banking crises, as firms switched away from domestic to international markets, in contrast to the GFC. For example, the regressions show an increase in the shares of foreign currency financing within syndicated loan markets as well as for total debt (Table 12, Panel B).

Overall, our results highlight that the dynamics of debt attributes over time depend not only on how these attributes evolved in individual markets, but also on the changing weight of each market. The direction of debt market switches during crises played an important role in the overall amount raised, maturity, and currency composition of newly issued debt.

6. Conceptual Framework on Firms' Financing Choices

Before concluding, we use a simple static model of the choice between several financing options to illustrate the type of mechanisms behind the evidence on debt substitution and compensation across different debt markets presented in the paper. The starting point for our discussion is the model presented in Becker and Ivashina (2014) that describes the choice between domestic bonds and domestic loans, subject to a limit on the availability of the cheaper source (domestic loans). We extend this model by including a third financing choice: international markets. Then, we use this framework to show how the demand for the different sources of financing and the aggregate debt amount change when there is an exogenous shock to the supply of credit.

The representative firm output function is $f(K)$ with decreasing marginal returns, $f'(K) > 0$ and $f''(K) < 0$, $\forall K$. The firm must raise K externally to be able to produce (it has no internal funding).

The firm can choose to obtain financing from: (i) loans in domestic markets (A); (ii) bonds in domestic markets (B); and/or (iii) debt in international markets (C). Thus, $K \leq A + B + C$.

We impose a limit on the availability of financing through domestic loans. For example, the deposit base could constrain the total amount of financing available through banks. Hence, the total borrowed amount cannot exceed an upper limit D, namely, $A \leq D$.

Based on the literature, we assume that financing K through bonds is more expensive and generally riskier than financing K through loans. The cost of issuance for firms encompasses not only the required interest rate, but also other costs associated with the characteristics of the capital raising activity. In the case of bonds, firms need to take into account the minimum issuance size, the expense related to obtaining a bond rating, the payment to the financial intermediary, and the difficulty to deal with different debtors. Under distress, the dispersion of bond investors reduces their incentives to renegotiate debt payments relative to banks, which can monitor firms more closely and can thus offer greater flexibility for firms than bondholders (Bolton and Scharfstein, 1996; Hackbarth, et al., 2007; Crouzet, 2018). From the lenders' perspective, a key factor pushing the cost of loans below that of bonds is that loans are senior in the event of default, so lenders can recover the principal more easily (Schwert, 2020). Therefore, we assume that the cost of bonds to the firm is given by is $y\ (B)$, which displays increasing marginal costs, so that $y'(B) > 0$ and $y''(B) > 0$, $\forall B$. Without loss of generality, we assume that the cost of domestic bank loans A to the firm is fixed at R.

We assume that financing K in international markets is also more expensive than financing it from local banks, especially once firms take into account the issuance cost and the larger issuance size required to raise capital in international markets, among other things (Gozzi et al., 2015; Calomiris et al., 2019). Hence, the cost of C to the firm is given by $y^*(C)$, which entails increasing marginal costs, $y^{*\prime}(C) > 0$ and $y^{*\prime\prime}(C) > 0$, $\forall C$.

The firm's problem is:

$$\text{maximize } f(K) - RA - y(B) - y^*(C), \tag{3}$$

$$\text{subject to: } K \le A + B + C \text{ and } A \le D.$$

The demand for domestic loan financing is given by the following first order condition:

$$f'(A + B + C) = R. \tag{4}$$

To ensure that the firm chooses other sources of financing in equilibrium besides domestic loans, we assume that:

$$f'(K) > R, \ \forall K \tag{5}$$

Under assumption (5), the firm maximizes its borrowing from source A, thus $A = D$.

The equilibrium conditions for the demand for domestic bond financing and international debt financing are given by:

$$f'(D + B + C) = y'(B), \tag{6a}$$

$$f'(D + B + C) = y^{*\prime}(C). \tag{6b}$$

Hence, in equilibrium, $y'(B) = y^{*\prime}(C)$.

We now consider how these financing choices change when there is a negative shock to the supply of loans, a decline in D. Because the demand for loans continues to be equal to D, A also declines. The changes in the demand for domestic bonds (B_D) and for financing in foreign markets (C_D) are derived by differentiating (6a) and (6b) with respect to D and solving, respectively, for B_D and C_D, which yields:

$$B_D = \frac{f''(D + B + C) \, y^{*\prime\prime}(C)}{y''(B) \, y^{*\prime\prime}(C) - f''(D + B + C) \, y''(B) - f''(D + B + C) \, y^{*\prime\prime}(C)}, \tag{7a}$$

$$C_D = \frac{f''(D + B + C) \, y''(B)}{y''(B) \, y^{*\prime\prime}(C) - f''(D + B + C) \, y''(B) - f''(D + B + C) \, y^{*\prime\prime}(C)}. \tag{7b}$$

Given that $f''(.) < 0$, $y''(.) > 0$, and $y^{*''}(.) > 0$, we can show that:

$$B_D \in (-1, 0), \qquad\qquad (8)$$

$$C_D \in (-1, 0).$$

Therefore, the activity in the domestic loan market is negatively correlated with that in other markets. That is, a *negative* supply shock in the domestic loan market leads to a *substitution* away from domestic loans toward both domestic bonds and/or international markets. Moreover, such substitutions are *imperfect* when comparing markets pairwise. For instance, the increase in domestic bond financing less than fully offsets the decline in domestic loan financing. If the firm only had access to two sources of funding (e.g., *A* and *B*), there would be a decline in total financing *K* in equilibrium relative to before the shock. However, when firms have access to the three markets under consideration, we cannot establish whether the total amount borrowed *K* increases or decreases. To do so, we would need to impose explicit functional forms for the production and cost functions. Firms can substitute financing away from the shock-hit market toward the other two debt markets. Hence, the new total amount borrowing *K* depends on how the two alternative debt markets (domestic bonds *B* and international debt *C*) respond to the bank credit supply contraction.

The framework above extends the existing analyses on the determinants of corporate debt structure, which tend to focus on the choice between bank loans and bonds. The main reference models associate the composition of debt instruments with the riskiness of the borrower, which can be firms (Diamond, 1991; Rajan, 1992; Bolton and Freixas, 2000) or countries (Hale, 2007). Other papers study the transmission of monetary shocks in models with debt heterogeneity, where bank loans and bonds are considered imperfect substitutes. These papers focus on the effects of such shocks on the amount of bond and loan financing and the types of firms obtaining that financing (Kashyap et al., 1993; Holmstrom and Tirole, 1997; Repullo and Suarez, 2000; Bolton and Freixas,

2006). In a dynamic setting, a contraction in bank credit supply can lead to an imperfect substitutability between bonds and loans at the aggregate level, as individual firms that switch across markets reduce total borrowing to offset the higher risk associated with bond debt (Crouzet, 2018).

The static framework presented in this paper generates the same main prediction arising from more complex dynamic models: firms do not fully compensate financing when moving from loans to bonds during bank credit supply contractions. The extension of the framework from two to three financing choices through the inclusion of international debt markets shows that firms react to market specific credit supply shocks by switching not only between bond and loan financing, but also between domestic and international debt. While the direction of the market switches is predictable, the overall magnitude of total financing is not. It is thus an empirical question what happens to the overall financing volumes, as well as the effects on the financing conditions of such switches across markets.

Our findings that firms react to crises in specific markets by increasing their capital raising in other markets show that debt compensation occurs not only between bond and loan financing, but also between domestic and international debt. When a specific market contracts, the compensation can involve more than one alternative market. We find that emerging economy firms fully offset the decline in cross-border lending during the GFC by issuing more domestic bonds and domestic syndicated loans. Likewise, firms fully offset the decline in domestic lending during domestic banking crises by issuing more bonds and cross-border debt. However, only the firms that can overcome the higher issuance cost of bonds and international debt can perform such movements across markets. These findings highlight the importance of analyzing more complete markets when firms face shocks.

6. Conclusions

This paper contributes to the growing discussions on corporate debt around the world by analyzing how firms borrow in domestic and international bond and syndicated loan markets. Expanding the

literature based on the United States and domestic issuance data, we find that firms from around the world switched away from the markets most affected by crises. The inclusion of international issuances in the analysis is a key element to find this pattern. By increasing issuances in alternative debt markets, firms compensated (partially and sometimes fully) for the decline in lending in the crisis-hit markets. These compensations at the firm level are also observed at the economy-industry level within the four markets we analyze. Because the different debt markets in which firms borrow are not identical, debt maturity and currency denomination changed as firms moved across them. Consequently, we obtain different dynamics on the aggregate volume and terms of financing when considering the four debt markets than when focusing on each market individually, as the literature usually does. Overall, the analysis of more complete markets shows evidence consistent with market-specific credit contractions during crises due to supply-side shocks, which prompted firms to change the borrowing location. These changes had significant effects on the volume and terms of financing during the crises analyzed.

There is, however, substantial heterogeneity across firms. On the one hand, relatively larger firms (the ones with access to international markets) are more capable of cushioning the consequences of crises by moving abroad when there is a domestic shock or moving back home when the crisis happens abroad. These firms also drive our aggregate results given that they captured most of the issuance activity we observe within countries. On the other hand, firms issuing only in domestic markets (typically smaller firms) could face declining financing, shorter maturities, and could be crowded out by the firms returning to domestic markets during shocks in foreign markets. During domestic banking crises, firms issuing only in domestic markets would be constrained by the evolution of these markets, perhaps lacking similar alternative markets to compensate for the domestic shock. Hence, when implementing policies aimed at mitigating the effects of shocks, policy makers might want to focus on constrained (smaller) firms that are not be able to tap different markets. These

policies might be focused not only on promoting more complete markets, but also on providing liquidity or better terms to the specific markets and firms under stress.

Whereas the results in this paper could be driven by supply- and demand-side factors, the findings suggest that it is difficult to discard the role of the supply side of funds, with firms responding to the changing financing conditions. First, we find that firms consistently moved away from the markets most likely affected by financial shocks (the syndicated loan market during the GFC and domestic syndicated loan markets during domestic banking crises), while borrowing typically increased in all the other debt markets. If our patterns were demand driven, we would observe firms moving away from several debt markets, not just from the markets in crisis, as their overall demand for credit contracted. Second, the observed changes in currency composition show that the movement toward foreign markets and foreign currency borrowing during domestic crises is unlikely to be consistent with firms' preferences. During crises, domestic currencies tend to depreciate while exchange rate volatility increases, making foreign currency borrowing riskier for firms. The finding of a stable or increasing maturity, on the other hand, is consistent with both supply- and demand-side factors.

The evidence in this paper has implications for different discussions related to debt borrowing behavior and the transmission of financial shocks across markets. The fact that firms obtain financing from different sources highlights the importance of analyzing the different types of financing jointly to capture the amount and terms of financing at the country and firm levels. Some authors have already started to focus on the idea that firms borrow in both bond and loan markets and switch between them. We show that switches are more generalized than previously documented, emphasizing the need to account for switches between domestic and international markets.

References

Abraham, F., Cortina, J.J., Schmukler, S., 2019. "The Rise of Domestic Capital Markets for Corporate Financing." World Bank Policy Research Working Paper 8844.

Adrian, T., Colla, P., Shin, H.S., 2013. "Which Financial Frictions? Parsing Evidence from the Financial Crisis of 2007-09." *NBER Macroeconomics Annual* 27(1): 159-214.

Almeida, H., Campello, M., Laranjeira, B., Weisbenner, S., 2011. "Corporate Debt Maturity and the Real Effects of the 2007 Credit Crisis." *Critical Finance Review* 1(1): 3-58.

Arteta, C., Hale, G., 2008. "Sovereign Debt Crises and Credit to the Private Sector." *Journal of International Economics* 74(1): 53-69.

Becker, B., Ivashina, V., 2014. "Cyclicality of Credit Supply: Firm-level Evidence." *Journal of Monetary Economics* 62(C): 76-93.

Bekaert, G., Harvey C.R., Lundblad, C.T., Siegel, S., 2011. "What Segments Equity Markets?" *Review of Financial Studies* 24(12): 3842-3890.

Benmelech, E., Dlugosz, J., Ivashina, V., 2012. "Securitization without Adverse Selection: The Case of CLOs." *Journal of Financial Economics* 106(1): 91-113.

Bolton, P., Scharfstein, D.S., 1996. "Optimal Debt Structure and the Number of Creditors." *Journal of Political Economy* 104(1): 2-25.

Bolton, P., Freixas, X., 2000. "Equity, Bonds and Bank Debt: Capital Structure and Financial market Equilibrium under Asymmetric Information." *Journal of Political Economy* 108 (2): 324-351.

Bolton, P, Freixas, X., 2006. "Corporate Finance and the Monetary Transmission Mechanism." *Review of Financial Studies* 19(3): 829-870.

Blaise, G., 2004. "The Syndicated Loan Market: Structure, Development, and Implications." *BIS Quarterly Review*: 75-89.

Broner, F., Lorenzoni, G., Schmukler, S., 2013. "Why Do Emerging Economies Borrow Short Term?" *Journal of the European Economic Association* 11(1): 67-100.

Bruche, M., Malherbe, F., Meisenzahl, R., 2017. "Pipeline Risk in Leveraged Loan Syndication." CEPR Discussion Paper 11956.

Brunnermeier, M., 2009. "Deciphering the Liquidity and Credit Crunch 2007-2008." *Journal of Economic Perspectives* 23(1): 77-100.

Bruno, V., Shin, H.S., 2017. "Global Dollar Credit and Carry Trades: A Firm-level Analysis." *Review of Financial Studies* 30(3): 704-749.

Calomiris, C., Larrain, M., Schmukler, S., Williams, T., 2019. "Search for Yield in Large International Corporate Bonds: Investor Behavior and Firm Responses." NBER Working Paper No. 25979.

Cerutti, E., Hale, G., Minoiu, C., 2015. "Financial Crises and the Composition of Cross-Border Lending." *Journal of International Money and Finance* 52: 60-81.

Chemmanur, T., Fulghieri, P., 1994. "Reputation, Renegotiation, and the Choice between Bank Loans and Publicly Traded Debt." *Review of Financial Studies* 7(3): 475-506.

Chen, H., Xu, Y., Yang, J., 2012. "Systematic Risk, Debt Maturity, and the Term Structure of Credit Spreads." NBER Working Paper 18367.

Claessens, S., Schmukler, S., 2007. "International Financial Integration through Equity Markets: Which Firms from Which Countries Go Global?" *Journal of International Money and Finance*, 26(5): 788-813.

Claessens, S., 2016. "Global Banking: Recent Developments and Insights from Research." *Review of Finance* 21(4): 1513-1555.

Claessens, S., Dell'Ariccia, G., Igan, D., Leaven, L., 2010. "Cross-country Experiences and Policy Implications from the Global Financial Crisis." *Economic Policy* 25(62): 267-293.

Crouzet, N., 2018. "Aggregate Implications of Corporate Debt Choices." *Review of Economic Studies* 85(3): 1635-1682.

De Fiore, F., Uhlig, H., 2015. "Corporate Debt Structure and the Financial Crisis." *Journal of Money, Credit and Banking* 47(8): 1571-1598.

Demirgüç-Kunt, A., Martinez-Peria, M.S., Tressel, T., 2020. "The Global Financial Crisis and the Capital Structure of Firms: Was the Impact More Severe among SMEs and Non-listed Firms?" *Journal of Corporate Finance* 60, forthcoming.

Diamond, D., 1991. "Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt." *Journal of Political Economy* 99(4): 689-721.

Diamond, D., and He., Z., 2014. "A Theory of Debt Maturity: The Long and Short of Debt Overhang." *Journal of Finance* 69(2): 719-762.

Didier, T., Hevia, C., Schmukler, S., 2012. "How Resilient and Countercyclical Were Emerging Economies during the Global Financial Crisis?" *Journal of International Money and Finance* 31(8): 2052-2077.

Eichengreen, B., Hausmann, R., 1999. "Exchange Rates and Financial Fragility." *Federal Reserve Bank of Kansas City Proceedings*: 329-368.

Eichengreen, B., 2010. "Lessons of the Crisis for Emerging Markets." *International Economics and Economic Policy* 7(1): 49-62.

Erel, I., Julio, B., Kim, W., Weisbach, M.S., 2012. "Macroeconomic Conditions and Capital Raising." *Review of Financial Studies* 25(2): 341-376.

Gonzalez, V.M., 2015. "The Financial Crisis and Corporate Debt Maturity: The Role of Banking Structure." *Journal of Corporate Finance* 35(1): 310-328.

Gozzi, J.C., Levine, R., Martinez Peria, M.S., Schmukler, S., 2015. "How Firms Use Corporate Bond Markets under Financial Globalization." *Journal of Banking and Finance* 58(C): 532-555.

Graham, J.R., Harvey, C.R., 2001. "The Theory and Practice of Corporate Finance: Evidence from the Field." *Journal of Financial Economics* 60(2): 187-243.

Greenspan, A., 1999. "Do Efficient Financial Markets Mitigate Financial Crises?" Financial Markets Conference of the Federal Reserve Bank of Atlanta.

Gruić, B., Wooldridge, P., 2012. "Enhancements to the BIS Debt Securities Statistics." *BIS Quarterly Review*: 63-76.

Hackbarth, D., Hennessy, C.A., Leland, H.E., 2007. "Can the Trade-Off Theory Explain Debt Structure?" *Review of Financial Studies* 20(5): 1389-1428.

Hale, G., 2007. "Bonds or Loans? The Effect of Macroeconomic Fundamentals." *Economic Journal* 117(516): 196-215.

Hale, G., Arteta, C., 2009. "Currency Crises and Foreign Credit in Emerging Markets: Credit Crunch or Demand Effect?" *European Economic Review* 53(7): 758-778.

Hale, G., Jones, P., Spiegel, M., 2016. "The Rise in Home Currency Issuance." Working Paper Series 2014-19. Federal Reserve Bank of San Francisco.

Harford, J., Klasa, S., Maxwell, W., 2014. "Refinancing Risk and Cash Holdings." *Journal of Finance* 69(3): 975-1012.

Haselmann, R., Wachtel, P., 2011. "Foreign Banks in Syndicated Loan Markets." *Journal of Banking and Finance* 35(10): 2679-2689.

Hausmann R., Panizza, U., 2011. "Redemption or Abstinence? Original Sin, Currency Mismatches and Counter Cyclical Policies in the New Millennium." *Journal of Globalization and Development* 2(1): 1-35.

He, Z., Milbradt, K., 2016. "Dynamic Debt Maturity." *Review of Financial Studies* 29(10): 2677-2736.

He, Z., Xiong, W., 2012. "Rollover Risk and Credit Risk." *Journal of Finance* 67(2): 391-429.

Henderson, B.J., Jegadeesh, N., Weisbach, M.S., 2006. "World Markets for Raising New Capital." *Journal of Financial Economics* 82 (1): 63-101.

Holmstrom, B., Tirole, J., 1997. "Financial Intermediation, Loanable Funds, and the Real Sector." *Quarterly Journal of Economics* 112(3): 663-691.

Ivashina, V., Scharfstein, D., 2010. "Bank Lending during the Financial Crisis of 2008." *Journal of Financial Economics* 97(1): 319-338.

Japelli, T., Pagano, M., 2008. "Financial Market Integration under EMU." European Economy Economic Papers 312, European Commission.

Kalemli-Ozcan, S., Papaioannou, E., Perri, F., 2013. "Global Banks and Crisis Transmission." *Journal of International Economics* 89(2): 495-510.

Kashyap, A., Stein, J., Wilcox, D., 1993. "Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance." *American Economic Review* 83(1): 78-98.

Karolyi, G.A., Stulz, R.M., 2003. "Are Financial Assets Priced Locally or Globally?" In *Handbook of the Economics of Finance* 1(1): 975-1020. Edited by G. Constantinides, M. Harris, and R.M., Stulz.

Kim, W., Weisbach, M., 2008. "Motivations for Public Equity Offers: An International Perspective." *Journal of Financial Economics* 87(2): 281-307.

Khwaja, A.I., Mian, A., 2008. "Tracing the Impact of Bank Liquidity Shocks: Evidence from an Emerging Market." *American Economic Review* 98(4): 1413-1442.

Krishnamurthy, A., 2010. "How Debt Markets Have Malfunctioned in the Crisis." *Journal of Economic Perspectives* 24(1): 3-28.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., Vishny, R., 1997. "Legal Determinants of External Finance." *Journal of Finance* 52(3): 1131-1150.

Leaven, L., Valencia, F., 2012. "Systemic Banking Crisis Database: An Update." IMF Working paper 08/224.

Levine, R., Lin, C., Xie, W., 2016. "Spare Tire? Stock Markets, Banking Crises, and Economic Recoveries." *Journal of Financial Economics* 120(1): 81-101.

Levy Yeyati, E., Martinez Peria, M.S, Schmukler, S., 2010. "Depositor Behavior under Macroeconomic Risk: Evidence from Bank Runs in Emerging Economies." *Journal of Money, Credit and Banking* 42(4): 585-614.

Mian, A., Santos, J.A., 2018. "Liquidity Risk and Maturity Management over the Credit Cycle." *Journal of Financial Economics* 127(2): 264-284.

Pagano, M., Röell, A.A., Zechner, J., 2002. "The Geography of Equity Listing: Why Do Companies List Abroad?" *Journal of Finance*, 57(6): 2651-2694.

Pirinsky, C., Wang, Q., 2006. "Does Corporate Headquarters Location Matter for Stock Returns?" *Journal of Finance* 61(4): 1991-2015.

Rajan, R.G., 1992. "Insiders and Outsiders: The Choice between Informed and Arm's-length Debt." *Journal of Finance* 47(4): 1367-1400.

Rauh, J., Sufi, A., 2010. "Capital Structure and Debt Structure." *Review of Financial Studies* 23(12): 4242-4280.

Repullo, R., Suarez, J., 2000. "Entrepreneurial Moral Hazard and Bank Monitoring: A Model of the Credit Channel." *European Economic Review* 44(10): 1931-1950.

Roberts, M.R., and Sufi, A., 2009. "Renegotiation of Financial Contracts: Evidence from Private Credit Agreements." *Journal of Financial Economics* 93(2): 159-184.

Sachs, J., Tornell, A., Velasco, A., 1996. "The Collapse of the Mexican Peso: What Have we Learned?" *Economic Policy* 11(22): 13-63.

Schwert, M., 2020. "Does Borrowing from Banks Cost More than Borrowing from the Market?" *Journal of Finance*, forthcoming.

Servaes, H., Tufano, P., 2006. "The Theory and Practice of Corporate Debt Structure." Global Survey of Corporate Financial Policies and Practices, Deutsche Bank.

Sufi, A., 2007. "Information Asymmetry and Financing Arrangements: Evidence from Syndicated Loans." *Journal of Finance* 62(2): 629-668.

World Bank, 2018. "Bakers without Borders." Global Financial Development Report.

Xiao, J., 2018. "Corporate Debt Structure, Precautionary Savings, and Investment Dynamics." Meeting Papers 887, Society for Economic Dynamics.

Figure 1. Total Amount Raised in Equity, Corporate Bond, and Syndicated Loan Markets

This figure shows the total amount raised per year in equity, corporate bond, and syndicated loan markets by firms in advanced economies (Panel A) and emerging economies (Panel B). Total debt is the sum of the amount raised through corporate bonds and syndicated loans. Values are reported in billions of constant 2011 U.S. dollars (USD).

A. Advanced Economies
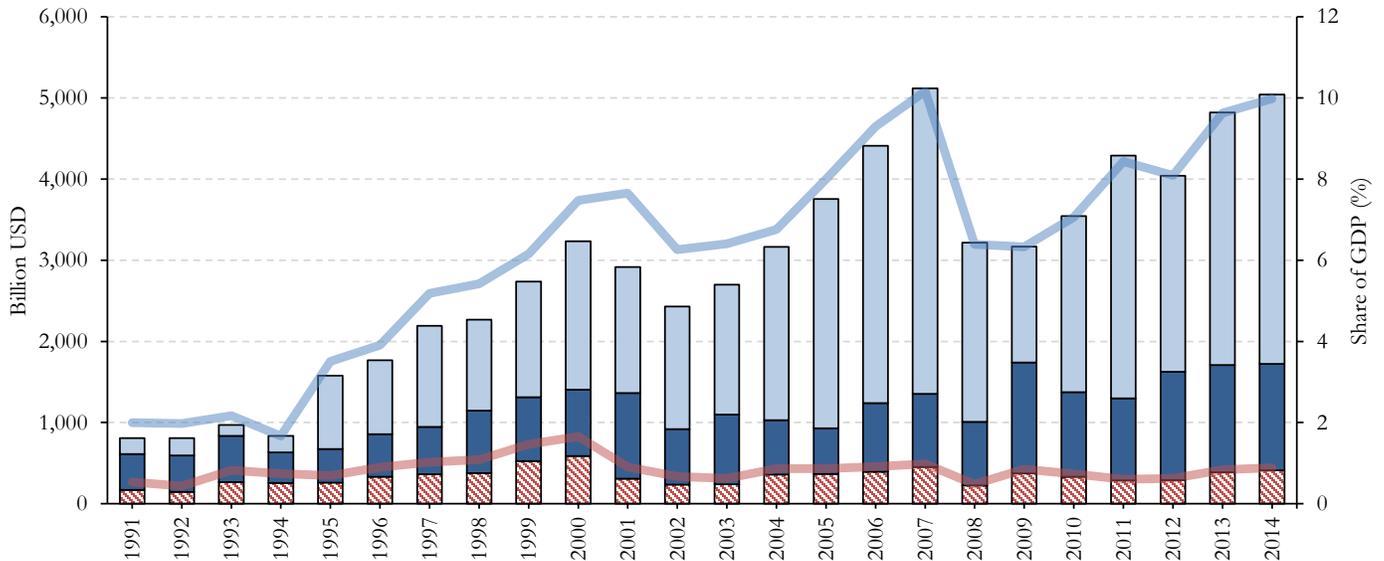
B. Emerging Economies
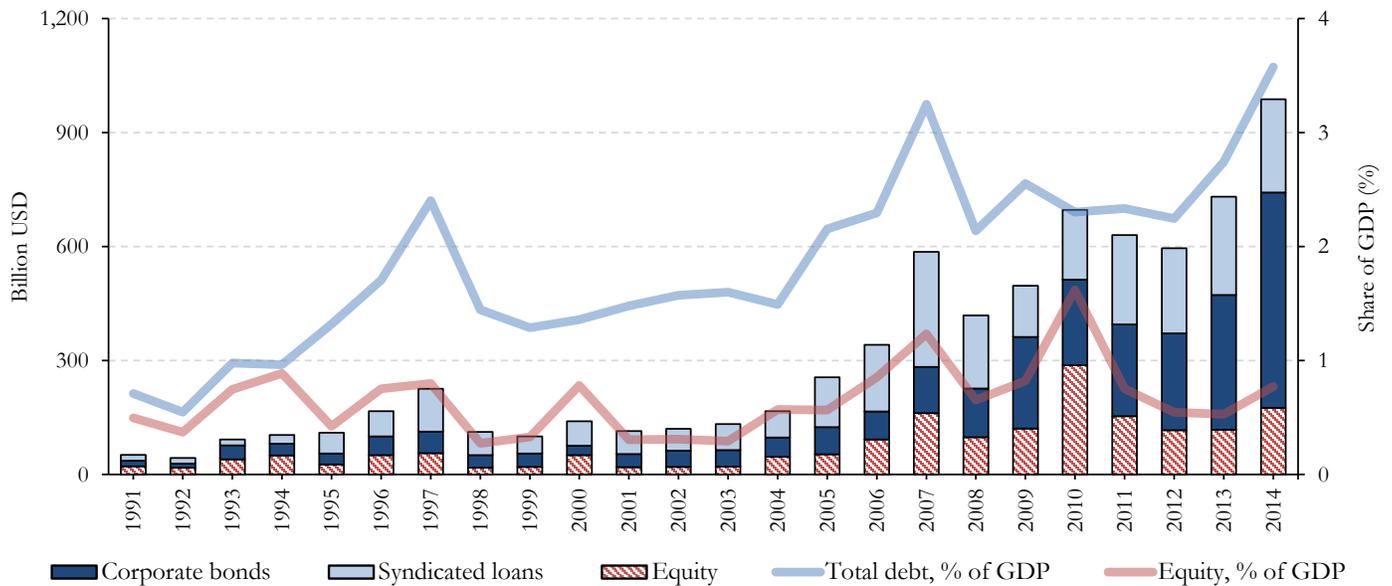
Figure 2. Size of Debt Markets

This figure shows the share of debt raised in different markets during crisis and non-crisis periods. It shows the average share of bonds over total debt issued per year (Panel A), the average share of cross-border bonds over total bonds issued per year (Panel B), and the average share of cross-border syndicated loans over total syndicated loans issued per year (Panel C). The transaction-level issuance data are aggregated to country-year observations. The global financial crisis analysis covers the 2005-2009 period, with 2005-2007 as the pre-crisis period and 2008-2009 as the crisis period. The domestic banking crises analysis covers the 1991-2014 period. The crisis period covers the country-year observations with domestic banking crises reported in the Reinhart and Rogoff database on financial crises. The non-crisis period covers all other country-year observations. The statistics are reported for the average economy in each period.

A. Share of Bonds over Total Debt
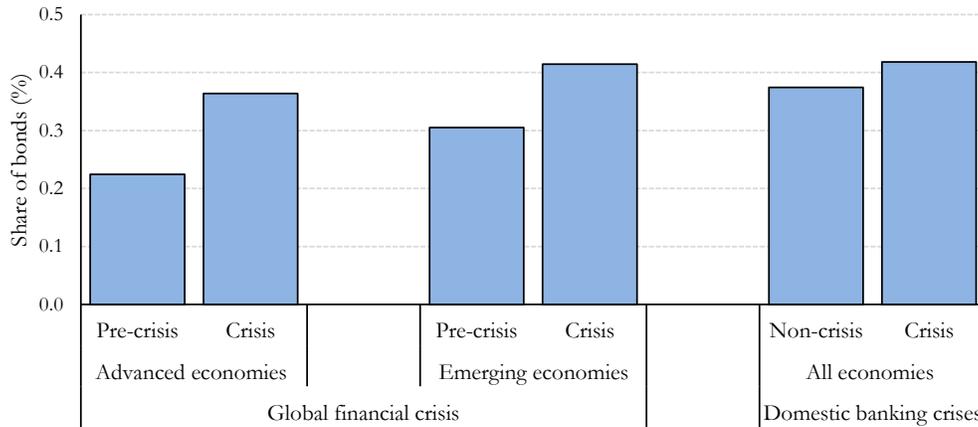
B. Share of Cross-border Bonds over Total Bonds
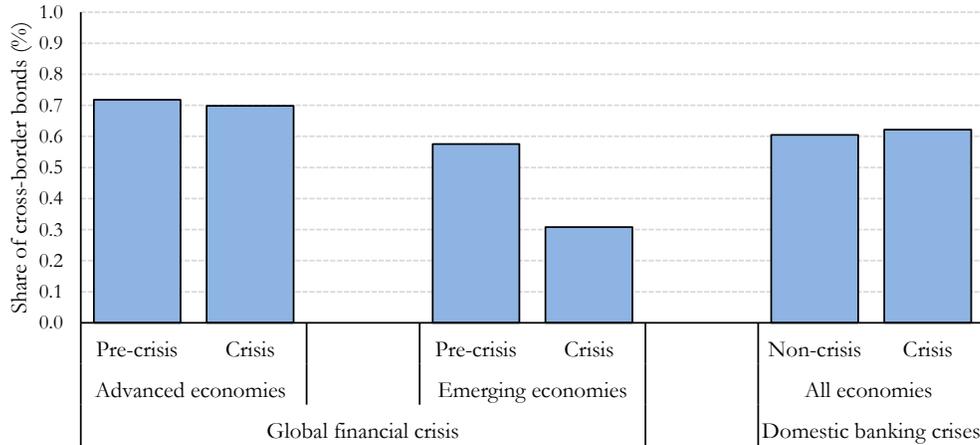
C. Share of Cross-border Syndicated Loans over Total Syndicated Loans
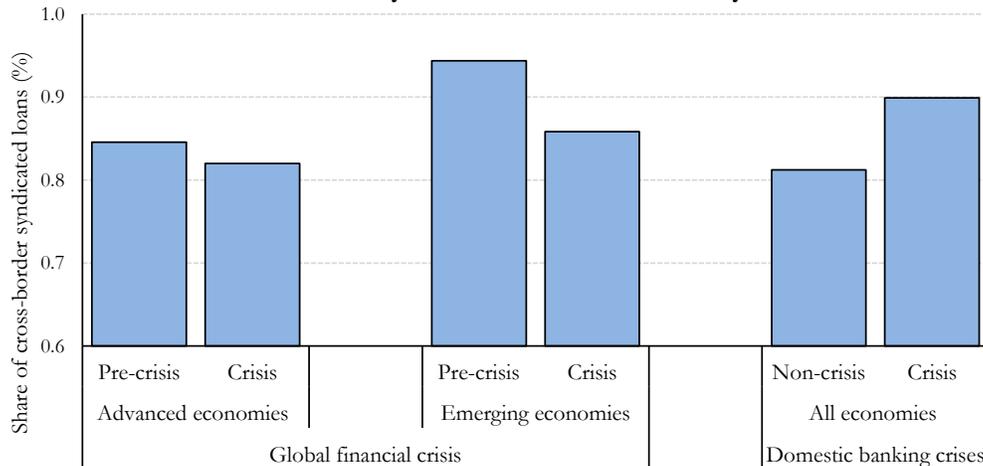
Figure 3. Debt Issuance Activity in Advanced Economies

This figure shows the attributes of the debt issued by firms from advanced economies around the global financial crisis. Panel A shows the aggregate amount raised per year, measured as log of (1+amount raised). Panel B shows the value weighted average debt maturity at issuance per year. Panel C shows the share of foreign currency debt over the total amount raised per year. The crisis years are highlighted. All reported statistics are aggregates across all advanced economies in the sample.

A. Amount Raised

B. Maturity at Issuance

C. Share of Foreign Currency Debt

Total debt — Corporate bonds — Syndicanted loans
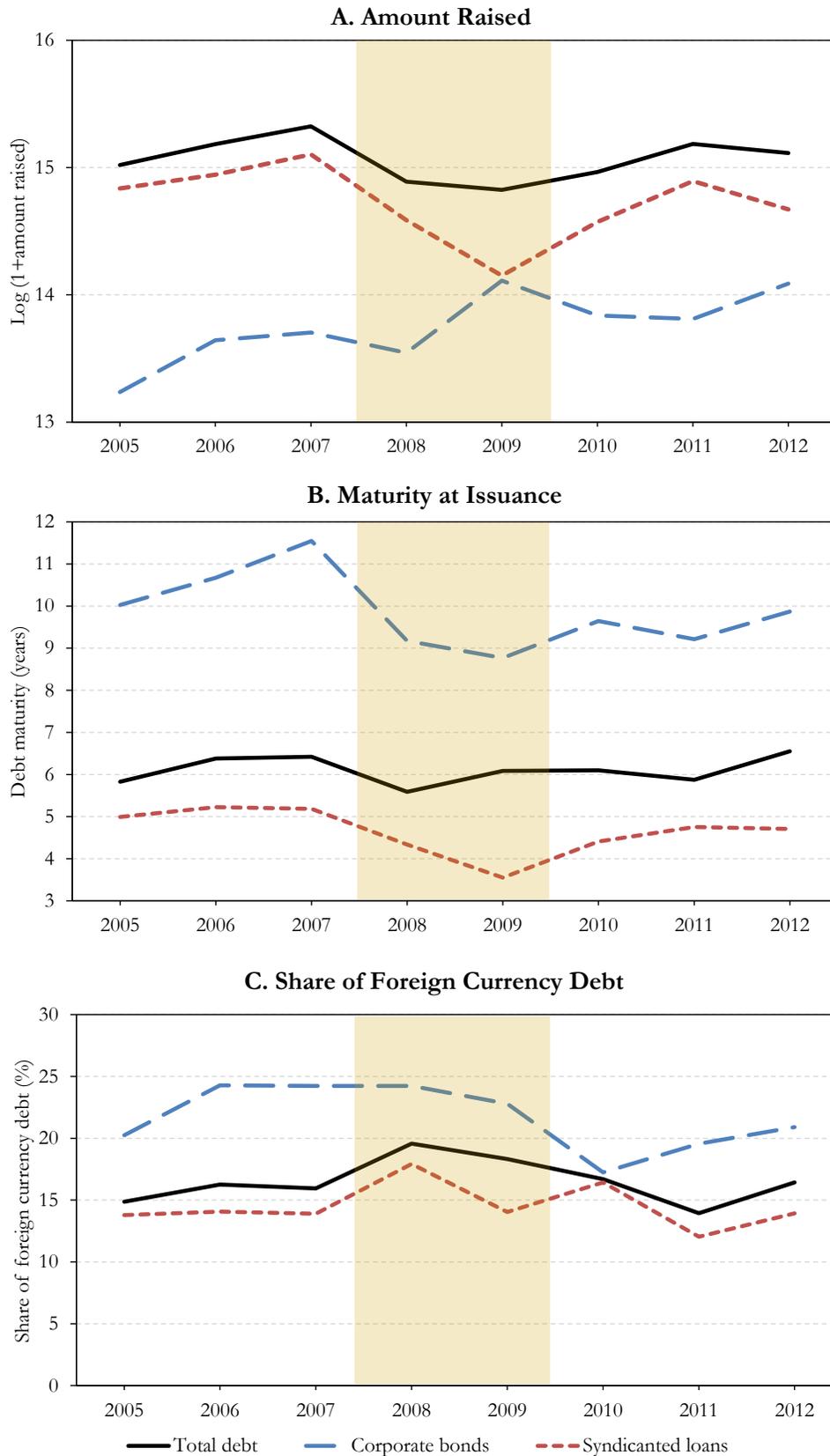
Figure 4. Debt Issuance Activity in Emerging Economies

This figure shows the attributes of the debt issued by firms from emerging economies around the global financial crisis. Panel A shows the aggregate amount raised per year, measured as log of (1+amount raised). Panel B shows the value weighted average debt maturity at issuance per year. Panel C shows the share of foreign currency debt over the total amount raised per year. The crisis years are highlighted. All reported statistics are aggregates across all advanced economies in the sample.

A. Amount Raised

B. Maturity at Issuance

C. Share of Foreign Currency Debt

Total debt   Corporate bonds   Syndicated loans
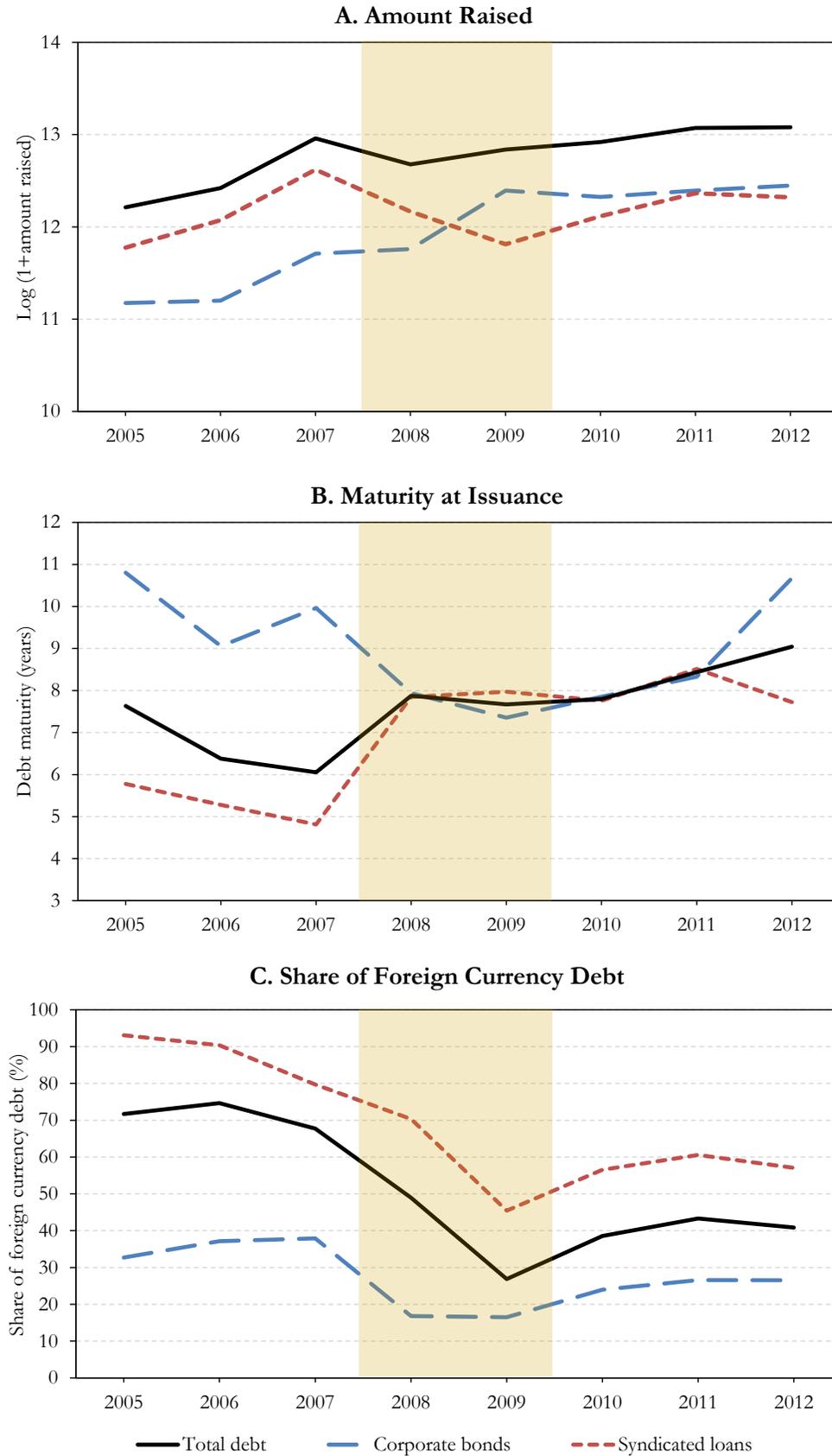
Table 1. Summary Statistics

This table shows the number of issuers, the number of issuances, and the amount raised in corporate bond and syndicated loan markets during 1991-2014. Listed firms are those that appear as listed in public stock exchanges at least once during the sample period. The amounts raised are reported in billions of constant 2011 U.S. dollars (USD).

A. All Economies				
Debt Market	No. of firms	Share of listed firms	No. of issuances	Total raised (billion USD)
Total debt	56,826	34%	184,496	$66,537
Corporate bonds	24,899	55%	84,761	$22,064
Syndicated loans	40,824	29%	99,735	$44,472
B. Advanced Economies				
Debt Market	No. of firms	Share of listed firms	No. of issuances	Total raised (billion USD)
Corporate bonds	19,880	57%	72,069	$19,294
Syndicated loans	35,634	30%	90,999	$41,671
C. Emerging Economies				
Debt Market	No. of firms	Share of listed firms	No. of issuances	Total raised (billion USD)
Corporate bonds	5,019	45%	12,692	$2,770
Syndicated loans	5,190	23%	8,736	$2,801

Table 2. Debt Market Choice during the Global Financial Crisis

This table shows logit estimates analyzing the debt market choice around the global financial crisis. The dependent variables are: a dummy that equals one (zero) if a firm issued a bond (syndicated loan) in a given day (Panel A); a dummy that equals one (zero) if a firm issued a domestic (cross-border) bond in a given day (Panel B); and a dummy that equals one (zero) if a firm issued a domestic (cross-border) syndicated loan in a given day (Panel C). The transaction-level issuance data are aggregated to firm-day observations. The estimations cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years. Base values correspond to the mean of the dependent variable during the pre-crisis period. The reported statistics are the marginal effects implied by the logit estimations. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Bonds versus Syndicated Loans

Dependent variable:	Dummy dit =1 if the firm (i) issued a bond in day (t), dit =0 if the firm issued a syndicated loan			
Sample:	Advanced economies		Emerging economies	
Base value:	0.28		0.52	
Crisis period (2008-09)	0.06 ***	0.08 ***	0.09 ***	0.19 ***
	[0.01]	[0.03]	[0.02]	[0.05]
Fixed Effects:				
Economy-industry	Yes	No	Yes	No
Firm	No	Yes	No	Yes
No. of observations	38,960	11,765	4,656	1,021

B. Domestic versus Cross-border Bonds

Dependent variable:	Dummy dit =1 if the firm (i) issued a cross-border bond in day (t), dit =0 if the firm issued a domestic bond			
Sample:	Advanced economies		Emerging economies	
Base value:	0.30		0.27	
Crisis period (2008-09)	-0.05 ***	-0.08 *	-0.16 ***	-0.25 ***
	[0.02]	[0.05]	[0.02]	[0.08]
Fixed Effects:				
Economy-industry	Yes	No	Yes	No
Firm	No	Yes	No	Yes
No. of observations	10,417	2,331	2,292	430

C. Domestic versus Cross-border Syndicated Loans

Dependent variable:	Dummy dit =1 if the firm (i) issued a cross-border loan in day (t), dit =0 if the firm issued a domestic loan			
Sample:	Advanced economies		Emerging economies	
Base value:	0.37		0.81	
Crisis period (2008-09)	-0.04 ***	-0.05 **	-0.21 ***	-0.28 ***
	[0.01]	[0.02]	[0.03]	[0.10]
Fixed Effects:				
Economy-industry	Yes	No	Yes	No
Firm	No	Yes	No	Yes
No. of observations	27,878	4,052	1,622	145

Table 3. Debt Market Choice during Domestic Banking Crises

This table shows logit estimates analyzing the debt market choice during domestic banking crises. The dependent variables are: a dummy that equals one (zero) if a firm issued a bond (syndicated loan) in a given day (Panel A); a dummy that equals one (zero) if a firm issued a domestic (cross-border) bond in a given day (Panel B); and a dummy that equals one (zero) if a firm issued a domestic (cross-border) syndicated loan in a given day (Panel C). The last four columns in the table show two robustness exercises: (i) the exclusion of the global financial crisis years from the sample period; (ii) the exclusion of economies with domestic banking crises during the global financial crisis years (Austria, Belgium, Denmark, France, Germany, Greece, Hungary, Ireland, Netherlands, Portugal, Spain, Russian Federation, Switzerland, United Kingdom, and United States). The transaction-level issuance data are aggregated to firm-day observations. The estimations cover the 1991-2014 period. The crisis period covers the country-years with domestic banking crises reported in the Reinhart and Rogoff database on financial crises. The non-crisis period covers all other country-years in the sample. Base values correspond to the mean of the dependent variable during the pre-crisis period. The reported statistics are the marginal effects implied by the logit estimations. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Corporate Bonds versus Syndicated Loans

Dependent variable:	Dummy $d_{it}=1$ if the firm (i) issued a bond in day (t), dit=0 if the firm issued a syndicated loan					
Sample:	All economies		All economies		Excl. 2008-09 crisis economies	
Period:	1991-2014		1991-2014 (excl. 2008-2009)		1991-2014	
Base value:	0.50		0.45		0.44	
Crisis period	0.12 ***	0.14 ***	0.16 ***	0.17 ***	0.46 ***	0.36 ***
	[0.02]	[0.02]	[0.02]	[0.02]	[0.03]	[0.02]
Fixed Effects:						
Economy-industry	Yes	No	Yes	No	Yes	No
Firm	No	Yes	No	Yes	No	Yes
No. of observations	170,415	78,935	155,601	71,214	73,129	26,698

B. Domestic versus Cross-border Corporate Bonds

Dependent variable:	Dummy $d_{it}=1$ if the firm (i) issued a cross-border bond in day (t), dit=0 if the firm issued a domestic bond					
Sample:	All economies		All economies		Excl. 2008-09 crisis economies	
Period:	1991-2014		1991-2014 (excl. 2008-2009)		1991-2014	
Base value:	0.16		0.21		0.21	
Crisis period	0.04 ***	0.04	0.03 ***	0.02	0.03 ***	0.04
	[0.01]	[0.03]	[0.01]	[0.03]	[0.01]	[0.05]
Fixed Effects:						
Economy-industry	Yes	No	Yes	No	Yes	No
Firm	No	Yes	No	Yes	No	Yes
No. of observations	78,039	27,064	72,847	24,102	40,714	13,105

C. Domestic versus Cross-border Syndicated Loans

Dependent variable:	Dummy $d_{it}=1$ if the firm (i) issued a cross-border loan in day (t), dit=0 if the firm issued a domestic loan					
Sample:	All economies		All economies		Excl. 2008-09 crisis economies	
Period:	1991-2014		1991-2014 (excl. 2008-09)		1991-2014	
Base value:	0.28		0.40		0.40	
Crisis period	0.05 ***	0.07 ***	0.09 ***	0.10 ***	0.15 ***	0.27 ***
	[0.01]	[0.01]	[0.01]	[0.02]	[0.02]	[0.04]
Fixed Effects:						
Economy-industry	Yes	No	Yes	No	Yes	No
Firm	No	Yes	No	Yes	No	Yes
No. of observations	91,113	30,118	81,487	26,630	31,277	3,869

Table 4. Switchers and Non-switchers: Firm Size and Issuance Activity during Crises

This table shows the firm size and issuance activity of switchers and non-switchers around crises. Panel A shows the firm size of switchers and non-switchers. Panel B shows the percentage of issuing firms and of debt raised captured by switchers and non-switchers during crises. "Switchers" are firms issuing debt domestically or abroad during pre-crisis periods and then changing the issuance market location during crisis periods. "International non-switchers" are firms issuing debt only abroad during both pre-crisis and crisis periods. "Domestic non-switchers" are firms issuing only domestic debt during both pre-crisis and crisis periods. The estimations for the global financial crisis cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years. The estimations for domestic banking crises cover the 1991-2014 period, with the three years prior to domestic crises as pre-crisis years and the domestic banking crises reported in the Reinhart and Rogoff database as crisis years. Assets and deal sizes show, for the median firm in the median economy, the average value of assets and the average amount raised per issuance during 1991-2014. Assets and deal size values are reported in millions of constant 2011 U.S. dollars (USD). Firms issuing debt only during crises are excluded.

A. Firm Size

Type of issuer:	Global financial crisis				Domestic banking crises	
	Advanced economies		Emerging economies		All economies	
	Assets size	Deal size	Assets size	Deal size	Assets size	Deal size
Switchers	$6,166	$214	$3,464	$156	$4,581	$310
International non-switchers	$6,065	$366	$3,535	$194	$3,720	$276
Domestic non-switchers	$978	$69	$1,039	$53	$779	$99

B. Issuance Activity during Crises

Type of issuer:	Global financial crisis				Domestic banking crises	
	Advanced economies		Emerging economies		All economies	
	Share of total issuers	Share of total raised	Share of total issuers	Share of total raised	Share of total issuers	Share of total raised
Switchers	35%	59%	39%	53%	46%	74%
International non-switchers	16%	27%	26%	19%	19%	20%
Domestic non-switchers	49%	15%	35%	28%	35%	6%

Table 5. Debt Attributes per Market, Summary Statistics

This table shows summary statistics for debt attributes across the different debt markets. Transaction size is the average amount raised per issuance in each market. Debt maturity is the value weighted average maturity in each market. Share of foreign currency debt is the ratio of the amount raised through foreign currency issuances over the total amount raised in each market. The reported statistics are averages across all economies over the 1991-2014 period.

A. Advanced Economies						
Debt Market:	Corporate bonds			Syndicated loans		
	Domestic	Cross-border	Total	Domestic	Cross-border	Total
Transaction size (million USD)	$223	$397	$268	$269	$738	$461
Maturity (years)	10.4	8.6	9.8	4.1	4.7	4.5
Share of foreign currency debt	5%	42%	19%	3%	19%	14%

B. Emerging Economies						
Debt Market:	Corporate bonds			Syndicated loans		
	Domestic	Cross-border	Total	Domestic	Cross-border	Total
Transaction size (million USD)	$190	$338	$219	$319	$321	$323
Maturity (years)	6.0	9.7	7.1	11.3	5.8	7.2
Share of foreign currency debt	2%	95%	29%	17%	92%	73%

Table 6. Debt Attributes per Market, Panel Regressions

This table shows linear regression estimates characterizing the debt attributes in each debt market during 1991-2014. The dependent variables (debt attributes) are the log of the amount raised, maturity (in years), and the share of debt raised in foreign currency. In Panel A, the different debt attributes are regressed on dummy variables for cross-border syndicated loans, domestic bonds, and cross-border bonds (domestic syndicated loans are the omitted benchmark). In Panel B, the different debt attributes are regressed on: (i) a dummy for corporate bonds (syndicated loans are the omitted benckmark) and (ii) a dummy for cross-border debt (domestic debt is the omitted benchmark). The transaction-level issuance data are aggregated to firm-day observations. All regressions include firm and economy-industry-quarter fixed effects. Cross-border (domestic) debt includes both cross-border (domestic) corporate bonds and cross-border (domestic) syndicated loans. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

	A. Differences across Markets					
Sample:	Advanced economies			Emerging economies		
Dependent variable:	Log of amount raised	Maturity (years)	Foreign currency debt	Log of amount raised	Maturity (years)	Foreign currency debt
Cross-border loans	0.27 ***	-0.08	0.04 ***	-0.43 ***	-2.34 ***	0.53 ***
	[0.01]	[0.06]	[0.00]	[0.08]	[0.33]	[0.03]
Domestic bonds	-0.44 ***	5.74 ***	-0.04 ***	-0.93 ***	-1.22 ***	-0.26 ***
	[0.02]	[0.12]	[0.00]	[0.09]	[0.34]	[0.02]
Cross-border bonds	-0.34 ***	4.07 ***	0.27 ***	-0.32 ***	0.46	0.50 ***
	[0.02]	[0.11]	[0.01]	[0.09]	[0.35]	[0.03]
Fixed Effects:						
Economy-industry-quarter	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	133,262	133,262	133,262	13,103	13,103	13,103
No. of clusters	6,751	6,751	6,751	2,313	2,313	2,313
R-squared	0.82	0.55	0.73	0.82	0.69	0.93
	B. Differences across Instruments and Issuance Locations					
(1) Bonds vs syndicated loans	-0.55 ***	5.41 ***	0.02 ***	-0.36 ***	1.28 ***	-0.38 ***
(2) Cross-border vs domestic debt	0.32 ***	-1.83 ***	0.13 ***	0.39 ***	-0.30 *	0.74 ***

Table 7. Debt Issuance Amount during the Global Financial Crisis in Advanced Economies

This table shows linear regression estimates characterizing the changes in debt issuance during the global financial crisis for advanced economies. It shows the regressions for the log of (1+amount raised) on a dummy for the crisis period. The transaction-level issuance data are aggregated to firm-quarter observations. The estimations cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years. Separate regressions are estimated for different debt markets. All regressions include either economy-industry fixed effects or firm fixed effects. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Log (1+amount raised)									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total				
Crisis period (2008-09)	0.22 ***	0.08 ***	0.29 ***	-0.02	-0.43 ***	-0.44 ***	0.20 ***	-0.34 ***	-0.13 ***	-0.07 ***
	[0.04]	[0.02]	[0.06]	[0.04]	[0.04]	[0.06]	[0.03]	[0.03]	[0.03]	[0.02]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
No. of observations	36,403	36,403	36,403	36,403	36,403	36,403	36,403	36,403	36,403	24,454
No. of clusters	2,634	2,634	2,634	2,634	2,634	2,634	2,634	2,634	2,634	2,131
R-squared	0.13	0.14	0.13	0.16	0.20	0.12	0.14	0.27	0.26	0.86

Table 8. Terms of Financing during the Global Financial Crisis in Advanced Economies

This table shows linear regression estimates characterizing the changes in debt maturity and currency denomination at issuance during the global financial crisis for advanced economies. It shows the regressions for the debt maturity (Panel A) or the share of debt raised in foreign currency (Panel B) on a dummy for the crisis period. The transaction-level issuance data are aggregated to firm-quarter observations. The estimations cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years. Separate regressions are estimated for different debt markets. All regressions include either economy-industry fixed effects or firm fixed effects. The regressions are estimated using weighted least squares, with each observation being weighted by its corresponding total amount raised. The top 1% of all firm-quarterly observations in terms of the total amount raised are excluded from the analysis. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

A. Maturity

Dependent variable:	Debt maturity									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total				
Crisis period (2008-2009)	-1.98 ***	-1.92 ***	-1.99 ***	-0.66 ***	-1.19 ***	-1.01 ***	-0.42 **	-0.98 ***	-0.36 ***	-0.28
	[0.36]	[0.34]	[0.27]	[0.10]	[0.14]	[0.10]	[0.18]	[0.14]	[0.14]	[0.19]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
No. of observations	6,744	2,764	9,391	17,751	10,140	27,678	24,085	12,749	36,039	24,097
No. of clusters	1,003	1,096	1,584	1,283	1,938	2,286	1,655	2,201	2,620	2,111
R-squared	0.17	0.21	0.19	0.31	0.20	0.23	0.16	0.14	0.09	0.45

B. Currency

Dependent variable:	Share of foreign currency debt									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total				
Crisis period (2008-2009)	-0.01	-0.04	-0.03 ***	0.01 *	0.00	-0.01	0.00	0.01	0.00	0.00
	[0.01]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]	[0.01]	[0.01]	[0.01]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
No. of observations	6,744	2,764	9,391	17,751	10,140	27,678	24,085	12,749	36,039	24,097
No. of clusters	1,003	1,096	1,584	1,283	1,938	2,286	1,655	2,201	2,620	2,111
R-squared	0.48	0.48	0.46	0.21	0.51	0.43	0.33	0.45	0.40	0.77

Table 9. Debt Issuance Amount during the Global Financial Crisis in Emerging Economies

This table shows linear regression estimates characterizing the changes in debt issuance during the global financial crisis for emerging economies. It shows the regressions for the log of (1+amount raised) on a dummy for the crisis period. The transaction-level issuance data are aggregated to firm-quarter observations. The estimations cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years. Separate regressions are estimated for different debt markets. All regressions include either economy-industry fixed effects or firm fixed effects. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Log (1+amount raised)									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total	debt	debt		
Crisis period (2008-2009)	0.74 ***	-0.34 ***	0.39 ***	0.38 ***	-0.67 ***	-0.29 ***	1.09 ***	-0.99 ***	0.09 **	0.02
	[0.09]	[0.06]	[0.09]	[0.05]	[0.09]	[0.10]	[0.10]	[0.10]	[0.04]	[0.05]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
No. of observations	4,347	4,347	4,347	4,347	4,347	4,347	4,347	4,347	4,347	2,347
No. of clusters	1,233	1,233	1,233	1,233	1,233	1,233	1,233	1,233	1,233	924
R-squared	0.27	0.10	0.21	0.27	0.27	0.22	0.27	0.31	0.22	0.78

Table 10. Terms of Financing during the Global Financial Crisis in Emerging Economies

This table shows linear regression estimates characterizing the changes in debt maturity and currency denomination at issuance during the global financial crisis for emerging economies. It shows the regressions for the debt maturity (Panel A) or the share of debt raised in foreign currency (Panel B) on a dummy for the crisis period. The transaction-level issuance data are aggregated to firm-quarter observations. The estimations cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years. Separate regressions are estimated for different debt markets. All regressions include either economy-industry fixed effects or firm fixed effects. The regressions are estimated using weighted least squares, with each observation being weighted by its corresponding total amount raised. The top 1% of all firm-quarterly observations in terms of the total amount raised are excluded from the analysis. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

A. Maturity

Dependent variable:	Debt maturity									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total				
Crisis period (2008-2009)	-0.85 **	-1.51 **	-1.06 ***	-0.05	0.45	0.84 **	-0.42	0.29	0.06	-0.15
	[0.42]	[0.59]	[0.35]	[0.99]	[0.32]	[0.36]	[0.42]	[0.30]	[0.28]	[0.29]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
No. of observations	1,769	470	2,242	478	1,631	2,110	2,250	2,113	4,303	2,311
No. of clusters	701	272	840	173	751	826	775	856	1,222	915
R-squared	0.45	0.39	0.37	0.33	0.31	0.38	0.36	0.25	0.28	0.67

B. Currency

Dependent variable:	Share of foreign currency debt									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total				
Crisis period (2008-2009)	0.00	0.01	-0.12 ***	-0.46 ***	-0.04 **	-0.20 ***	-0.12 ***	-0.03 *	-0.22 ***	-0.17 ***
	[0.01]	[0.03]	[0.03]	[0.08]	[0.02]	[0.03]	[0.03]	[0.01]	[0.02]	[0.03]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
No. of observations	1,769	470	2,242	478	1,631	2,110	2,250	2,113	4,303	2,311
No. of clusters	701	272	840	173	751	826	775	856	1,222	915
R-squared	0.36	0.33	0.38	0.40	0.41	0.49	0.22	0.34	0.46	0.77

Table 11. Debt Issuance Amount during Domestic Banking Crises

This table shows linear regression estimates characterizing the changes in debt issuance during domestic banking crises. It shows the regressions for the log of (1+amount raised) on a dummy for the crisis periods. The transaction-level issuance data are aggregated to firm-quarter observations. The estimations cover the 1991-2014 period. The crisis period covers the country-years with domestic banking crises reported in the Reinhart and Rogoff database on financial crises. The non-crisis period covers all other country-years in the sample. Separate regressions are estimated for different debt markets. All regressions include quarter fixed effects and either economy-industry fixed effects or firm fixed effects. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Log (1+amount raised)									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total				
Crisis period	0.18 ***	0.32 ***	0.49 ***	-0.68 ***	0.27 ***	-0.41 ***	-0.45 ***	0.58 ***	0.11 ***	0.01
	[0.04]	[0.03]	[0.05]	[0.04]	[0.03]	[0.04]	[0.04]	[0.05]	[0.02]	[0.02]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
Quarter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	150,167	150,167	150,167	150,167	150,167	150,167	150,167	150,167	150,167	121,389
No. of clusters	13,055	13,055	13,055	13,055	13,055	13,055	13,055	13,055	13,055	11,564
R-squared	0.18	0.13	0.15	0.19	0.19	0.25	0.15	0.24	0.28	0.79

Table 12. Terms of Financing during Domestic Banking Crises

This table shows linear regression estimates characterizing the changes in debt maturity and currency denomination at issuance during domestic banking crises. It shows the regressions for the debt maturity (Panel A) or the share of debt raised in foreign currency (Panel B) on a dummy for the crisis periods. The transaction-level issuance data are aggregated to firm-quarter observations. The estimations cover the 1991-2014 period. The crisis period covers the country-years with domestic banking crises reported in the Reinhart and Rogoff database on financial crises. The non-crisis period covers all other country-years in the sample. Separate regressions are estimated for different debt markets. All regressions include quarter fixed effects and either economy-industry fixed effects or firm fixed effects. The regressions are estimated using weighted least squares, with each observation being weighted by its corresponding total amount raised. The top 1% of all firm-quarterly observations in terms of the total amount raised are excluded from the analysis. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

A. Maturity

Dependent variable:	Debt maturity									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total				
Crisis period	-0.02	0.00	-0.07	-0.18	-0.51 ***	-0.43 ***	0.82 ***	-0.33 ***	0.17 **	0.25 **
	[0.15]	[0.25]	[0.13]	[0.11]	[0.08]	[0.07]	[0.12]	[0.08]	[0.08]	[0.10]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
Quarter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	49,341	13,618	63,578	51,902	36,110	88,637	100,682	50,202	148,680	119,910
No. of clusters	6,501	5,124	9,205	4,588	7,959	9,393	8,546	9,854	13,019	11,516
R-squared	0.24	0.16	0.20	0.32	0.20	0.24	0.15	0.12	0.10	0.37

B. Currency

Dependent variable:	Share of foreign currency debt									
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt	
	Domestic	Cross-border	Total	Domestic	Cross-border	Total				
Crisis period	0.00	-0.01	0.01	0.01 *	0.02 **	0.04 ***	0.00	0.02 ***	0.03 ***	0.01 *
	[0.00]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.00]	[0.01]	[0.01]	[0.01]
Fixed Effects:										
Economy-industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Firm	No	No	No	No	No	No	No	No	No	Yes
Quarter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	49,341	13,618	63,578	51,902	36,110	88,637	100,682	50,202	148,680	119,910
No. of clusters	6,501	5,124	9,205	4,588	7,959	9,393	8,546	9,854	13,019	11,516
R-squared	0.44	0.51	0.38	0.25	0.61	0.54	0.28	0.55	0.44	0.71

Appendix Table 1
Total Number of Issuances and Firms per Economy

This table shows, for each economy in the sample, the total number of issuances in corporate bond and syndicated loan markets as well as the number of issuing firms during 1991-2014.

	Advanced economies				Emerging economies		
Economy	Corporate bonds	Syndicated loans	No. of firms	Economy	Corporate bonds	Syndicated loans	No. of firms
Australia	2,024	3,744	1,452	Argentina	497	291	253
Austria	252	193	147	Brazil	2,247	790	1020
Belgium	416	611	222	Chile	626	381	232
Canada	3,577	4,638	2,066	China	4,366	1,877	2673
Czech Republic	46	243	104	Colombia	365	126	169
Denmark	182	225	98	India	1,837	2,486	1336
Finland	397	503	206	Indonesia	401	1,132	566
France	2,297	5,530	1,507	Kazakhstan	28	82	57
Germany	1,093	4,239	1,167	Malaysia	1,774	640	484
Greece	97	386	155	Mexico	1,147	801	500
Hong Kong SAR, China	981	1,368	825	Pakistan	29	164	78
Ireland, Rep	221	459	182	Panama	78	159	132
Israel	79	100	54	Peru	536	138	145
Italy	486	2,399	897	Philippines	270	348	153
Japan	10,789	21,120	6,328	Russian Federation	598	855	446
Korea, Rep.	17,426	972	3,184	South Africa	146	314	167
Luxembourg	466	347	196	Thailand	1,182	914	455
Netherlands	2,455	2,209	797	Turkey	37	476	184
New Zealand	306	953	203	Venezuela, RB	155	77	87
Norway	431	900	371	Vietnam	28	182	97
Poland	66	350	150				
Portugal	636	530	552				
Singapore	735	903	515				
Spain	463	3,884	1,296				
Sweden	571	874	260				
Switzerland	794	866	393				
Taiwan, China	5,004	4,099	1,249				
United Arab Emirates	56	464	151				
United Kingdom	3,633	8,401	2,587				
United States	35,094	73,008	20,439				
Total	**91,073**	**144,518**	**47,753**	**Total**	**16,347**	**12,233**	**9,234**

Appendix Table 2
Debt Market Choice during the Global Financial Crisis,
Excluding Cross-border Issuances

This table shows logit estimates analyzing the debt market choice around the global financial crisis. The dependent variable is a dummy that equals one (zero) if a firm issued a bond (syndicated loan) in a given day. The regressions exclude all cross-border debt issuances. The transaction-level issuance data are aggregated to firm-day observations. The estimations cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years. Base values correspond to the mean of the dependent variable during the pre-crisis period. The reported statistics are the marginal effects implied by the logit estimations. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

Corporate Bonds versus Syndicated Loans				
Dependent variable:	Dummy d$_{it}$=1 if the firm (i) issued a bond in day (t), d$_{it}$=0 if the firm issued a syndicated loan			
Sample:	Advanced economies		Emerging economies	
Base value:	0.28		0.52	
Crisis period (2008-2009)	0.04 ***	-0.01	-0.01	0.06
	[0.01]	[0.04]	[0.02]	[0.15]
Fixed Effects:				
Economy-industry	Yes	No	Yes	No
Firm	No	Yes	No	Yes
No. of observations	24,909	5,093	1,890	125

Appendix Table 3
Debt Market Choice during the Global Financial Crisis, Listed and Unlisted Firms

This table shows logit estimates analyzing the debt market choice of listed and unlisted firms around the global financial crisis. The dependent variables are: a dummy that equals one (zero) if a firm issued a bond (syndicated loan) in a given day (Panel A); a dummy that equals one (zero) if a firm issued a domestic (cross-border) bond in a given day (Panel B); and a dummy that equals one (zero) if a firm issued a domestic (cross-border) syndicated loan in a given day (Panel C). The transaction-level issuance data are aggregated to firm-day observations. The estimations cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years. Base values correspond to the mean of the dependent variable during the pre-crisis period. The reported statistics are the marginal effects implied by the logit estimations. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Corporate Bonds versus Syndicated Loans								
Dependent variable:	Dummy dit=1 if the firm (i) issued a bond in day (t), dit=0 if the firm issued a syndicated loan							
Sample:	Advanced economies				Emerging economies			
Type of firm:	Listed firms		Unlisted firms		Listed firms		Unlisted firms	
Base value:	0.36		0.16		0.59		0.42	
Crisis period (2008-2009)	0.06 ***	0.08 ***	0.04 ***	0.08 *	0.14 ***	0.17 ***	0.07 **	0.24 ***
	[0.01]	[0.03]	[0.01]	[0.04]	[0.03]	[0.06]	[0.03]	[0.09]
Fixed Effects:								
Economy-industry	Yes	No	Yes	No	Yes	No	Yes	No
Firm	No	Yes	No	Yes	No	Yes	No	Yes
No. of observations	19,611	9,678	18,561	2,087	2,083	759	2,301	262

B. Domestic versus Cross-border Corporate Bonds								
Dependent variable:	Dummy dit=1 if the firm issued a cross-border bond in day (t), dit=0 if the firm issued a domestic bond							
Sample:	Advanced economies				Emerging economies			
Type of firm:	Listed firms		Unlisted firms		Listed firms		Unlisted firms	
Base value:	0.25		0.36		0.40		0.17	
Crisis period (2008-2009)	-0.06 ***	-0.10 **	0.04	-0.01	-0.26 ***	-0.33 ***	-0.03	0.29
	[0.02]	[0.05]	[0.03]	[0.10]	[0.03]	[0.07]	[0.02]	[0.30]
Fixed Effects:								
Economy-industry	Yes	No	Yes	No	Yes	No	Yes	No
Firm	No	Yes	No	Yes	No	Yes	No	Yes
No. of observations	7,146	1,640	2,703	691	1,296	347	760	83

C. Domestic versus Cross-border Syndicated Loans								
Dependent variable:	Dummy dit=1 if the firm issued a cross-border loan in day (t), dit=0 if the firm issued a domestic loan							
Sample:	Advanced economies				Emerging economies			
Type of firm:	Listed firms		Unlisted firms		Listed firms		Unlisted firms	
Base value:	0.39		0.34		0.82		0.72	
Crisis period (2008-2009)	-0.05 ***	-0.04	-0.02 ***	-0.07 *	-0.24 ***	-0.29 ***	-0.28 ***	-0.27
	[0.01]	[0.03]	[0.01]	[0.04]	[0.05]	[0.10]	[0.04]	[0.22]
Fixed Effects:								
Economy-industry	Yes	No	Yes	No	Yes	No	Yes	No
Firm	No	Yes	No	Yes	No	Yes	No	Yes
No. of observations	11,646	2,635	15,648	1,417	451	83	975	62

Appendix Table 4
Debt Market Choice during Domestic Banking Crises,
Listed and Unlisted Firms

This table shows logit estimates analyzing the debt market choice of listed and unlisted firms during domestic banking crises. The dependent variables are: a dummy that equals one (zero) if a firm issued a bond (syndicated loan) in a given day (Panel A); a dummy that equals one (zero) if a firm issued a domestic (cross-border) bond in a given day (Panel B); and a dummy that equals one (zero) if a firm issued a domestic (cross-border) syndicated loan in a given day (Panel C). The transaction-level issuance data are aggregated to firm-day observations. The estimations cover the 1991-2014 period. The crisis period covers the country-years with domestic banking crises reported in the Reinhart and Rogoff database on financial crises. The non-crisis period covers all other country-years in the sample. Base values correspond to the mean of the dependent variable during the pre-crisis period. The reported statistics are the marginal effects implied by the logit estimations. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

A. Corporate Bonds versus Syndicated Loans

Dependent variable:	Dummy dit =1 if the firm (i) issued a bond in day (t), dit =0 if the firm issued a syndicated loan			
Type of firm:	Listed firms		Unlisted firms	
Base value:	0.51		0.37	
Crisis period	0.17 ***	0.16 ***	-0.02	0.05 **
	[0.02]	[0.02]	[0.02]	[0.02]
Fixed Effects:				
Economy-industry	Yes	No	Yes	No
Firm	No	Yes	No	Yes
No. of observations	93,101	62,221	76,851	16,714

B. Domestic versus Cross-border Corporate Bonds

Dependent variable:	Dummy dit =1 if the firm (i) issued a cross-border bond in day (t), dit =0 if the firm issued a domestic bond			
Type of firm:	Listed firms		Unlisted firms	
Base value:	0.2		0.23	
Crisis period	0.03 ***	0.03	0.05 ***	0.13 ***
	[0.01]	[0.03]	[0.01]	[0.04]
Fixed Effects:				
Economy-industry	Yes	No	Yes	No
Firm	No	Yes	No	Yes
No. of observations	50,108	21,229	27,436	5,835

C. Domestic versus Cross-border Syndicated Loans

Dependent variable:	Dummy dit =1 if the firm (i) issued a cross-border loan in day (t), dit =0 if the firm issued a domestic loan			
Type of firm:	Listed firms		Unlisted firms	
Base value:	0.40		0.39	
Crisis period	0.11 ***	0.11 ***	0.02 **	0.01
	[0.01]	[0.01]	[0.01]	[0.02]
Fixed Effects:				
Economy-industry	Yes	No	Yes	No
Firm	No	Yes	No	Yes
No. of observations	42,132	20,069	48,290	10,049

Appendix Table 5
Within Firms' Changes in Debt Issuance Amounts during Crises

This table shows linear regression estimates characterizing the within firms' changes in debt issuance during the crises. It shows the regressions for the log of (1+amount raised) on a dummy for the crisis period. The transaction-level issuance data are aggregated to firm-quarter observations. The estimations for the Global Financial Crisis cover the 2005-2009 period, with 2005-2007 as pre-crisis years and 2008-2009 as crisis years (Panels A and B). Panel A shows the results for firms in advanced economies. Panel B shows the results for firms in emerging economies. Panel C shows the estimations for domestic banking crises, covering the 1991-2014 period. In this case, the crisis period covers the country-years with domestic banking crises reported in the Reinhart and Rogoff database on financial crises. The non-crisis period covers all other country-years in the sample. Separate regressions are estimated for different debt markets. All regressions include firm fixed effects. Standard errors (in brackets) are clustered at the economy-industry-quarter level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

A. Debt Issuance Amount during the Global Financial Crisis in Advanced economies

Dependent variable:	Log (1+amount raised)								
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt
	Domestic	Cross-border	Total	Domestic	Cross-border	Total			
Crisis period (2008-2009)	0.24 ***	0.05 *	0.28 ***	0.02	-0.41 ***	-0.38 ***	0.26 ***	-0.34 ***	-0.07 ***
	[0.05]	[0.03]	[0.06]	[0.04]	[0.05]	[0.07]	[0.04]	[0.05]	[0.02]
Fixed Effects:									
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	24,454	24,454	24,454	24,454	24,454	24,454	24,454	24,454	24,454
No. of clusters	2,131	2,131	2,131	2,131	2,131	2,131	2,131	2,131	2,131
R-squared	0.57	0.58	0.61	0.63	0.62	0.55	0.60	0.68	0.86

B. Debt Issuance Amount during the Global Financial Crisis in Emerging Economies

Dependent variable:	Log (1+amount raised)								
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt
	Domestic	Cross-border	Total	Domestic	Cross-border	Total			
Crisis period (2008-2009)	0.73 ***	-0.22 **	0.48 ***	0.19 ***	-0.62 ***	-0.43 ***	0.84 ***	-0.80 ***	0.02
	[0.12]	[0.10]	[0.11]	[0.07]	[0.12]	[0.12]	[0.13]	[0.13]	[0.05]
Fixed Effects:									
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	2,347	2,347	2,347	2,347	2,347	2,347	2,347	2,347	2,347
No. of clusters	924	924	924	924	924	924	924	924	924
R-squared	0.72	0.48	0.67	0.63	0.68	0.70	0.68	0.72	0.78

C. Debt Issuance Amount during Domestic Banking Crises

Dependent variable:	Log (1+amount raised)								
Debt Market:	Corporate bonds			Syndicated loans			Total domestic debt	Total cross-border debt	Total debt
	Domestic	Cross-border	Total	Domestic	Cross-border	Total			
Crisis period	0.21 ***	0.22 ***	0.41 ***	-0.70 ***	0.21 ***	-0.47 ***	-0.40 ***	0.42 ***	0.01
	[0.04]	[0.04]	[0.04]	[0.04]	[0.03]	[0.04]	[0.04]	[0.05]	[0.02]
Fixed Effects:									
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	121,389	121,389	121,389	121,389	121,389	121,389	121,389	121,389	121,389
No. of clusters	11,564	11,564	11,564	11,564	11,564	11,564	11,564	11,564	11,564
R-squared	0.53	0.48	0.55	0.51	0.51	0.54	0.51	0.57	0.79