

# **Universal Banks and Corporate Control: Evidence from the Global Syndicated Loan Market\***

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## **Abstract**

We investigate the effects of bank control over borrower firms whether by representation on boards of directors or by the holding of shares through bank asset management divisions. Using a large sample of syndicated loans, we find that banks are more likely to act as lead arrangers in loans when they exert some control over the borrower firm. Bank-firm governance links are associated with higher loan spreads during the 2003-2006 credit boom, but lower spreads during the 2007-2008 financial crisis. Additionally, these links mitigate credit rationing effects during the crisis. The results are robust to several methods to correct for the endogeneity of the bank-firm governance link. Our evidence, consistent with intertemporal smoothing of loan rates, suggests there are costs and benefits from banks' involvement in firm governance.

**JEL classification:** G21, G32

**Keywords:** Universal banking, Syndicated loans, Corporate boards, Institutional ownership

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Banks are the most important source of external finance for corporations around the world. Even if we count only syndicated loans, firms borrow more money from banks than they raise through public debt and equity issuance together.<sup>1</sup> Recurring loan transactions imply that banks accumulate non-transferable information through their relationships with firms. They benefit from accessing and producing information on borrowers by exploiting economies of scale and scope. Bank-firm relationships extend beyond repeated lending interactions, as universal banks offer other financial services, underwrite and trade securities, and manage investment funds. This is most common in continental Europe, although recent industry consolidation has eroded the separation of commercial and investment banking in the United States as well.

We examine how bank involvement in corporate governance affects a firm's choice of lead arranger bank and loan supply, as well as pricing in the syndicated market. We use a large sample of syndicated loans to publicly listed non-financial firms over the 2003-2008 period to study the lending and governance relationships between banks and firms. The sample covers firms and banks in 42 countries. We collect information on two types of governance links between lead arranger banks and borrower firms: (1) whether a bank executive sits on a firm's board of directors; and (2) whether fund management companies affiliated with the same financial group as the lead arranger bank have equity holdings in the firm.

These bank-firm governance links capture a dimension of how dependent a firm is on its lender that has been largely overlooked in the literature. Kroszner and Strahan (2001a) find that over 30% of the largest U.S. firms have bankers on their boards of directors. The percentages are even higher in Japan and Germany (Kaplan and Minton 1994; and Dittman, Maug, and Schneider 2010). Although historically banks have held concentrated positions in some firms (La

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<sup>1</sup> Drucker and Puri (2006) report that U.S. industrial firms borrowed \$13.2 trillion in the 1993-2003 period via syndicated loans, whereas they issued \$10.2 trillion of public debt and \$2.3 trillion of common stock.

Porta, Lopez-de-Silanes, and Shleifer 1999; and Berlin 2000), these bank direct equity holdings are no longer as common. Institutional holdings, however, represent a growing channel of bank influence over firm governance. Almost all universal banking groups across most countries have developed large asset management divisions in recent years, offering mutual funds and other investment vehicles. These funds can invest in the same publicly listed firms to which banks make loans.

Our hypothesis is that a bank connected with a borrower firm (through a board seat or an institutional holding) has an information advantage over other banks. Even if the bank has no direct cash flow rights, as in the case of institutional holdings, or holds just control rights, as in the case of board representation, the bank-firm link may improve information flows between the bank and the firm through screening (Allen 1990) and monitoring (Diamond 1984).<sup>2</sup> A borrower firm under such influence may be inclined to reveal more information than it might in a straight transaction-oriented relation with another lender, and the bank itself has stronger incentives to invest in producing information (Boot 2000). Banks providing arm's-length finance would thus be at a disadvantage. Our hypothesis predicts that bank-firm governance links lead to more lending and lower interest rate spreads charged by linked banks than by similar non-linked banks.

An alternative hypothesis is that banks can use their board seats or equity stakes in a firm to promote their interests as creditors by directing more business toward themselves and arranging more favorable loan terms. The bank's position as an insider may allow it to extract rents from its information monopoly and potentially to hold-up a firm due to information asymmetries between other lenders and the firm (Sharpe 1990; and Rajan 1992). Banks can pressure firms to

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<sup>2</sup> An additional channel is that bank equity stakes can reduce agency costs (Jensen and Meckling 1976) and costs of financial distress (Berlin, John, and Saunders 1996).

take a loan at uncompetitive interest rates, and then make it difficult for them to access alternative credit as the connected bank has information that a new lender does not.

These two hypotheses are not mutually exclusive as we could see different effects of bank-firm governance links over time depending on credit market conditions—intertemporal smoothing of loan interest rates. We posit that linked banks charge lower interest rate spreads during financial crises but then higher spreads when economic conditions are favorable.<sup>3</sup> Furthermore, bank-firm governance links are likely to affect credit supply during financial crises. We posit that linked borrowers are less affected by credit rationing than non-linked borrowers during financial crises when banks face capital constraints.<sup>4</sup>

Allen and Gale (1995, 1997) highlight the benefits of long-term relationship banking systems in intertemporal smoothing of loan interest rates. They cite universal banks in Germany as an example of a relationship banking system, where banks have long-term ties to borrower firms, with a direct role in their governance. Research supports the notion that banks smooth loan rates to (small business) borrowers in response to changes in aggregate credit conditions (Petersen and Rajan 1994; Berger and Udell 1995; and Berlin and Mester 1998, 1999).<sup>5</sup>

We first examine whether a bank-firm governance link makes it more likely that the bank will be chosen as a lead arranger for future loans. To conduct this test, we pair firms with each of the top 20 banks in a country (in terms of syndicated loans activity regardless of a bank's nationality) and estimate a logit model. The results indicate that firms tend to obtain more loans

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<sup>3</sup> An alternative hypothesis is that rent extraction may be exacerbated during a financial crisis when firms are locked in to their lenders. Santos and Winton (2008) find that banks charge higher loan spreads during recessions to firms that are more bank-dependent, which they define as those firms with no access to public bond markets. In the case of bank-firm governance links, it is more likely that the bank supports the firm during financial crises.

<sup>4</sup> Previous studies find evidence of credit rationing during financial crises (De Haas and Van Horen 2011; Puri, Rocholl, and Steffen 2011; and Schnabl 2011) but prior relationships seem to mitigate these supply-side effects.

<sup>5</sup> Another possibility is that banks with control over firms can provide liquidity insurance to borrowers during periods of financial distress; Hoshi, Kashyap, and Scharfstein (1990) provide some evidence on this in Japan.

from banks to which they have governance links. Banks represented on a firm's board of directors are 21.8% more likely to be picked as lead arrangers than banks with no such representation (the probability increases from 15.7% to 37.4%). If the bank has affiliated institutional holdings in borrower firms, the probability increases by 9.2%.

We next analyze whether bank-firm governance links affect credit supply. We are interested in whether borrowers who have a prior governance link with the bank are more likely to receive a loan during the 2007-2008 financial crisis. We find a clear benefit to bank-firm governance links. While banks significantly reduce their loan activity during the financial crisis, we find that borrowers with governance links to the banks are less likely to suffer a drop in lending during the financial crisis. These effects are economically sizable. The decline in loan activity is lower by about 6% for linked borrowers than non-linked borrowers, and the probability of a stop in lending is lower by about 10%. Our evidence suggests that bank-firm governance links are important in mitigating credit rationing effects in times of financial crises.

We then examine whether a bank-firm governance link affects the loan terms. We find that banks with board seats or with institutional holdings in the borrower firm charged significantly higher loan spreads during the 2003-2006 credit boom than they charged to borrowers with no such link. The presence of a banker on a board of directors is associated with a higher loan spread of about 7 basis points (bps) over spreads for borrowers with no such link. In the case of an institutional holding link, the loan spread was higher by 15 bps over loans with no such link. These effects are economically significant, as they represent 6% and 12% of the average loan spread. Moreover, we do not find evidence that higher spreads are the result of relaxing non-pricing contract terms, such as collateral, covenants, or maturity.

We investigate the intertemporal smoothing of loan interest rates using the 2007-2008

financial crisis period when there was a spike in bank loan spreads (Brunnermeier 2010; Ivashina and Scharfstein 2010; and Santos 2011). We find that bank-firm board links are associated with significantly lower loan spreads during the financial crisis period. The presence of a banker on the borrower's board of directors is associated with a lower loan spread of about 13 bps than for borrowers with no such link. In the case of an institutional holding link, borrowers with a link still pay higher spreads by 8 bps than borrowers with no such link during the crisis, although this difference is lower than during the credit boom.

Overall, our findings show the costs and benefits to the involvement of banks in firm governance. We find intertemporal smoothing of loan interest rate spreads: Banks that have board links to firms charge higher spreads to linked firms during the credit boom period but lower spreads during the financial crisis. The interpretation is that bank-firm board links seem to be valuable when credit shocks hit. In the case of institutional holding links, the evidence suggests that the benefit of the link mainly accrues to the bank. Thus, the eagerness to help the firm at the time of a financial crisis is likely to be stronger in the case of board links than in the case of institutional holdings links as the former gives the bank additional access to information and influence through the boardroom. We also find that the intertemporal smoothing of loan spreads is more important in relationship-based lending than in transaction-based lending.

Another important concern with our findings is endogeneity of the presence of a bank as board member or as an institutional equity holder. It may be the case that banks tend to have governance links to poorer quality firms that face higher borrowing costs to start with. Additionally, a bank's presence as a board member or equity holder could arise endogenously in response to governance issues (Adams, Hermalin, and Weisbach 2010). This may explain why firms tend to obtain more loans from banks to which they have governance link and why the

bank presence is associated with higher spreads in a healthy economic climate.

We address endogeneity concerns in several ways. The results are robust to the inclusion of firm (and bank) fixed effects. The firm fixed effects specification controls for unobserved sources of firm heterogeneity and solves problems in which an unobserved time-invariant variable simultaneously determines both the loan spread and the bank-firm link. The other approach is instrumental variable estimation methods, where the first stage models the presence of the bank-firm link. We use two instruments: banking regulation restrictions on the mixing of banking and commerce in each country (Barth, Caprio, and Levine 2004) and whether the bank is publicly listed. We conclude that results are robust to this endogeneity bias correction.

Our study contributes to the literature by examining the costs and benefits of access to bank loans around the world when banks are involved in firm governance through board representation and affiliated institutional holdings. The international dimension of our study recognizes that banks and firms operate internationally. It also allows us to explore the cross-country variation in bank-firm governance links, and if the effect of these links is different between local banks vis-à-vis foreign banks.

Evidence on the effects of the presence of bankers on the boards of non-financial firms in the U.S. is mixed. Guner, Malmendier, and Tate (2008) find that firms obtain more loans when bankers join the board of directors, but these loans are mostly to financially unconstrained firms. Kroszner and Strahan (2001b) find that bankers hold seats on boards of large and low-risk firms, and they do not find significant effects on loan pricing. Evidence from international studies is also mixed (Drucker and Puri 2006).<sup>6</sup>

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<sup>6</sup> In Germany, Gorton and Schmid (2000) find that banks use their equity holdings and board seats to improve firm performance. More recently Dittman, Maug, and Schneider (2010) find evidence that bank representation on the boards of non-financial firms is not in the best interest of firms.

Our research goes beyond previous studies that focus on a particular type of link or investor in the U.S. Santos and Wilson (2007) find that banks charge lower interest rate spreads on firms when they hold a voting stake through their trust business. We examine links via other bank-affiliated institutional holdings (e.g., mutual funds), as well as board links. Jiang, Li, and Shao (2010) find lower interest rate spreads when an institutional investor simultaneously holds equity and debt claims of the same company. We look at lead arranger banks and their combined position through loans, as well as affiliated institutional holdings and board seats.

## **1. Data**

This section describes the sample and data. Appendix A provides detailed definitions and the data sources for all variables in the tests.

### **1.1 Sample of loans**

Data on syndicated bank loans are drawn from the Loan Pricing Corporation's DealScan database. DealScan includes information on a variety of loan contract terms (amount, all-in drawn spread, maturity, structure, purpose, and type). Information on syndicated loans allows us to identify the lead arranger banks of each loan.

Our initial sample covers all loans initiated from January 1, 2003 to December 31, 2008. Syndicated loan deals include multiple tranches (or loan facilities) that differ in price, type, and maturity (such as a line of credit and a term loan). Following Qian and Strahan (2007), Santos (2010), and others, we perform our main tests at the facility level; that is, we treat the facilities in each deal as different loans.<sup>7</sup> We exclude certain loan facilities from the sample: (1) loans in

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<sup>7</sup> There is no straightforward way to identify which facilities are part of a deal in DealScan. We assume that facilities make part of the same deal if (1) the borrower, (2) the deal date, (3) the primary purpose, and (4) the deal amount are all the same, and (5) the sum of the tranche amounts add up to the deal amount. We find similar results (not tabulated here) using only deals with a single facility or performing tests at the deal level.



which the borrower is a financial firm (SIC 6000-6999); (2) sovereign loans and loans in which the borrower is in the public sector (SIC 9000-9999); (3) deals with amounts below \$100 million (amounts converted to U.S. dollars when they are in a different currency) for the sum of the tranches; and (4) loans without information on all-in drawn spread.

We draw firm-level financial and market information for borrower firms from Datastream/Worldscope. We merge the loan item Borrower-Parent in DealScan with Datastream data using the firm's country and ticker. If that information is unavailable, we perform a manual match by firm name. Only firms that we are able to identify as publicly listed in Datastream are included in the sample.

To determine the most important banks worldwide, we use the top world banks list published by *The Banker* in 2005, which ranks the world's leading commercial banks sorted by Tier 1 capital. For tractability, we restrict the sample to the top 500 banks. These banks are responsible for nearly 90% of the total number and volume of syndicated loans in DealScan in 2003-2008.

We focus on the lead arranger banks of each loan facility, which usually hold the largest share of the syndicated loans (see Kroszner and Strahan 2001a). The lead arranger is frequently the administrative agent, with a fiduciary duty to other syndicate members to provide timely information about the default of the borrower. Thus, the responsibilities of a lead bank best fit the description of a relationship lender. We treat loans granted by a parent bank and loans granted by a subsidiary or a branch of this bank as loans originating from the same lead arranger. For example, we classify loans arranged by bank branches like Santander Brasil and wholly owned subsidiaries like Abbey National as loans made by Banco Santander. In the case of facilities with several lead arrangers, we consider each facility separately for each lead arranger

(i.e., each facility times the number of arrangers).<sup>8</sup>

In the regression tests, we control for several bank characteristics such as rank in *The Banker's* list of top banks and nationality (according to bank headquarters) using bank country dummies. Bank characteristics come from the Bankscope database, namely, bank size and profitability.

Our sample is biased towards large publicly listed firms in each country and market-oriented economies. Previous literature has shown that durable banking relationships create value even for large publicly traded firms (Lumier and McConnell 1989; and Houston and James 2001). “Relationship banking” is an important factor in the syndicated loan market (Bharath et al. 2007, 2011) even in a market-oriented economy like the U.S. However, we believe that this sample bias works against finding intertemporal smoothing of loan interest rates, and we expect the effects to be even stronger in a sample of smaller and privately held firms or in bank-oriented economies.

Table 1 summarizes our sample of loans by (borrower) country and bank. Panel A presents the number of loans, volume of loans, and number of firms by country. Our final sample includes 1,885 publicly listed non-financial borrower firms in 42 countries (1,118 U.S. firms and 767 non-U.S. firms), for a total of 17,181 loans and \$4.6 trillion in loan volume over the 2003-2008 period. There are 6,149 bank-firm pairs in the sample, of which 3,962 have at least two loans. Of the total number of loans, 14,862 were made during the credit boom period (2003 through the second quarter of 2007), and 2,319 during the crisis period (third quarter of 2007 through the end of 2008). Panel B presents similar information by bank for the top 30 ranked by volume of loans in 2003-2008. This list of top banks in the syndicated loan market includes some of the largest

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<sup>8</sup> Of a total of 1,232 different lead arrangers in syndicated loans during our sample period, 852 are affiliated with and matched to 237 of the top 500 banks.

banks in the world, such as Citigroup, JPMorgan Chase, and HSBC. The final sample includes a total of 102 banks. Table 2 presents summary statistics on loans, bank-firm, bank, and borrower firm variables.

## **1.2 Bank-firm governance links**

We consider whether banks have governance links to borrower firms in terms of: (1) board seats and (2) institutional holdings through bank-affiliated money managers. We measure bank-firm links as of the end of the year prior to the loan initiation.

We use the BoardEx database to find the board composition of publicly listed borrower firms and banks involved in the syndicated loan market. For each firm, BoardEx provides information on individual directors and network links of directors (i.e., all board positions an individual holds in other firms). We consider only first-degree network links between the list of banks and of firms. There is a bank-firm link when a bank executive is on the board of directors of a firm or when there is a board member common to the bank and the firm (at the end of the year before the loan initiation), except that we exclude instances where the common board member is an executive in the firm. The tests use a dummy variable (*Board Link Dummy*) for a board link, but we obtain consistent results when we use alternative variables such as the number of common board members between the bank and the firm or the sum of the number of years of tenure of common board members. These additional results are available in the Internet Appendix.<sup>9</sup>

We use LionShares, the leading source for institutional equity holdings worldwide, to obtain data on institutional holdings in publicly listed borrower firms. Ferreira and Matos (2008) use this data set to study the role of institutional investors in corporations around the world.

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<sup>9</sup> An Internet Appendix for this article is online at <http://www.sfsrfs.org/addenda.php>.

Institutions are defined as professional money managers: mutual fund companies, pension funds, bank trusts, and insurance companies.

Many of the banks involved in the syndicated loan market are part of universal banking groups that have asset management divisions that can invest in the same publicly listed companies to which the groups are lending. These divisions of banks are among the largest money management companies in the world. Of the top five money managers in the U.S., two are bank-affiliated (Barclays Global Investors and State Street Global Advisors), and three are stand-alone investment companies (Capital RM, Fidelity, and Vanguard). In France, all top five managers are affiliated with bank and insurance groups. In Germany, four of the top five are divisions of banks (Dresdner Bank Investment Management, DWS Investments, Deka Investments, and Union Investment), and one is independent (Universal Investment). We match the ultimate parent company of the institution to the list of top 500 banks (e.g., the ultimate parent for DWS Investments is Deutsche Bank). Thus, for each lead arranger bank, we identify the total institutional holdings of affiliated money managers in borrower firms in our sample.

In our tests, we use a dummy variable (*Institutional Holding Link Dummy*) that takes the value of one if institutional money managers that are affiliated with the lead arranger bank have an equity holding of at least 1% of shares outstanding in the borrower at the end of the year before the loan initiation. We obtain consistent findings (see Internet Appendix) when we use alternative variables such as the percentage of shares held by affiliated institutions.

A third type of governance link we control for is direct bank equity stakes. We also use LionShares to obtain insider ownership by banks in borrower firms.<sup>10</sup> We manually match insider names with the top banks to measure insider equity ownership by the lead arranger bank

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<sup>10</sup> LionShares data sources are public investor filings with regulatory agencies around the world (like U.S. Securities and Exchange Commission forms 3, 4, and 144) and company annual reports.

in the borrower firm for each loan. In our tests, we include as a control variable a dummy variable (*Insider Stake Link Dummy*) that takes the value of one if the lead arranger bank has an equity holding of at least 1% of shares outstanding in the borrower.

Panel A of Table 1 details bank-firm governance links by country. Of the 17,181 loans in our sample, 820 have a board link prior to the loan. Banks sit on the boards of 210 borrower firms of the 1,885 firms in our sample, meaning that 11% of the firms have at least one banker on the board of directors. Of the 17,181 loans in our sample, 1,672 had an institutional holding link prior to the loan. Bank groups have institutional holdings in 608 of the 1,885 borrower firms, meaning that more than 30% of the firms have at least one of the banks in our sample as an institutional holder. These two types of bank-firm governance links are thus quite frequent.

Of the 17,181 loans in our sample, only 81 had a bank insider stake link before the loan was made (or 25 of the 1,885 borrower firms). This bank-firm governance link is quite rare because of structural changes in banking activities over the last decades in some of the traditionally bank-dominated countries. For example, Dittman, Maug, and Schneider (2010) describe German banks' divestment of their equity holdings in recent years, despite retaining board seats and large shareholdings of fund management divisions in the largest German firms.

Panel B of Table 1 details bank-firm governance links for the 30 most active banks in the sample. The top banks have a considerable number of board connections. While often their asset management divisions have equity positions in the same firms to which the banks are lending, it is uncommon for banks to own equity directly.

### **1.3 Examples of top banks**

In this section we provide some examples of bank-firm governance links for top banks operating in the syndicated loan market (see the Internet Appendix for more details). JPMorgan Chase was

the most active lead arranger bank during the sample period, with 2,186 loans or \$961 billion. Board members from JPMorgan Chase held board seats in borrowers with a total of 138 loans in 2003-2008, including Boeing, IBM, and Verizon. JPMorgan Chase arranged \$11 billion in loans for IBM and Verizon, and \$9 billion for Boeing.<sup>11</sup> JPMorgan Asset Management (with a total of 293 funds through divisions in the U.S., U.K., Hong Kong, and Singapore) held large equity stakes, with a total of 178 loans with linked firms. Interestingly, Boeing (\$1.2 billion) is among the top holdings of JPMorgan asset management companies.

One of the more interesting examples of a bank with multiple connections is Deutsche Bank. As the largest of the universal banks, Deutsche Bank was also one of the best connected entities in the German corporate network, with 47 positions on firms' boards in our sample, including Siemens, Daimlerchrysler, Bayer, and Linde. In the case of Linde, Deutsche Bank arranged \$5 billion in loans in 2003-2008. Deutsche Bank's asset management companies' top equity holdings were in IBM (\$1.3 billion) and Hewlett-Packard (\$691 million) through DWS in Germany, and other Deutsche Bank asset management companies in the U.S., U.K., and other countries. Deutsche Bank acted as a lead arranger in loans of \$8 billion to Hewlett-Packard and \$6 billion to IBM (among top three borrowers of Deutsche Bank in 2003-2008). The fact that among the top borrowers and institutional holdings of Deutsche Bank are U.S. firms illustrates the importance of using an international sample for our study.

Banks in other countries also offer interesting cases. Société Générale in France had links to firms for which it acted as lead arranger: loans of \$8 billion to Vivendi (board link) and \$4 billion to Pernod Ricard (board link and equity holdings of \$201 million). Bank-firm governance

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<sup>11</sup> JPMorgan had no equity stakes in publicly listed firms in our sample period as a result of the legacy of the Glass-Steagall Act. Interestingly, however, during the last quarter of the nineteenth century and in the early twentieth century, JPMorgan's financial services were not "arm's-length," as Morgan executives frequently sat on the boards of their corporate clients and firms raised funds only through the Morgan partnership (Ramirez 1995).

links, however, do not always translate into loans as in the case of Danone, which was the top institutional holding of Société Générale’s asset management companies.

## 2. Do Bank-Firm Links Affect the Choice of Lead Arranger Bank?

### 2.1 Main results

We first test whether banks are more likely to arrange loans for firms when they play a role in the firm’s governance. The unit of analysis is a potential pairing between a company and a bank, where we need to consider both realized matches (bank  $i$  lends to firm  $j$ ) and unrealized matches (bank  $i$  does not lend to firm  $j$ ). For each borrower firm ( $j$ ), we create a choice set of potential banks that might reasonably act as lead arranger for the loan. We want to economize on the size of the data set yet retain most of the loans. We thus choose the top 20 banks operating in each country, regardless the bank’s nationality, as ranked by volume of loans arranged for firms headquartered in that country; all firms have at least one syndicated loan arranged by a top-20 bank operating in their country.<sup>12</sup> There is substantial variation in nationalities among the top 20 banks, with an average of nine different nationalities across countries. We then form 37,700 bank-firm ( $i, j$ ) pairs by combining  $i = 1, \dots, 20$  (banks) with  $j = 1, \dots, 1,885$  borrower firms.

To test whether a bank-firm link impacts the choice of the lead arranger bank, we estimate a logit model:

$$\text{Prob}(\textit{Loan Dummy})_{i,j} = a_0 + a_1(\textit{Bank-Firm Link})_{i,j} + a_2X_i + a_3Y_{i,j} + \varepsilon_{i,j}, \quad (1)$$

where the dependent variable, *Loan Dummy*, is a dummy variable that equals one if bank  $i$  acts as lead arranger in at least one loan to firm  $j$  over the 2003-2008 period, and zero otherwise. We

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<sup>12</sup> Bharath et al. (2007) also economize on the size of their data set by selecting the top 40 banks in the U.S., while Yasuda (2007) uses the top 15 banks in Japan. In our sample, the top 20 countries include local, regional, and global banks. For example, Banco Santander is number 1 in Spain, although it is not in the top 20 banks in France and the U.S. Société Générale, which is number 4 in Spain and number 3 in France, is also not ranked in the top 20 in the U.S. Citigroup, however, is number 3 in Spain, number 7 in France, and number 2 in the U.S.

use two alternative types of bank-firm governance link dummy variables: representation on the board of directors (*Board Link Dummy*), or the holding of shares through bank asset management divisions (*Institutional Holding Link Dummy*). We control for other bank-level ( $X_i$ ) and firm-bank level variables ( $Y_{i,j}$ ). All explanatory variables are measured as of the beginning of the sample period (December 2002). This procedure has the advantage of only using predetermined data as regressors, although the disadvantage of not updating bank-firm governance links for changes that take place after December 2002.

Table 3 presents the results of the logit model for the lead arranger bank choice. The coefficients for a bank-firm board and institutional link are positive and significant in all specifications. The evidence is consistent with the idea that bank involvement in a firm's governance increases the likelihood that the bank will provide a future loan.

We first run specifications that include borrower firm industry dummies and dummies for the country of origin of the borrower firm and of the bank. We adjust  $t$ -statistics for clustering at the firm and bank level. Estimates in column (1) in Table 3 illustrate the economic significance of the bank-firm board link on the probability that a bank will provide future loans. The predicted probability that a bank is chosen as lead arranger if it does not have a board seat in the borrower firm is 15.7% (keeping all other variables at their means), while the predicted probability that it is chosen if it does have a board link is 37.4%. Thus, the probability that a bank will be chosen as a lead arranger increases by 21.8% if the bank has a board link with the borrower firm. Similarly, institutional holding links are associated with an increase of 9.2% in the probability that the bank will act as a lead arranger (using the estimates in column (3)). In column (5) we consider jointly the two bank-firm governance links, and find that the coefficients on the two links are positive and significant. We control for direct bank equity stakes in all



specifications. Although insider stake links are quite infrequent, they are also associated with an increase in the probability that the bank will act as lead arranger.

The regressions control for other aspects of relationships between firms and banks observed in the literature. We construct a dummy variable (*Past Loan Relationship Dummy*) that takes the value of one if there is a syndicated loan between the lead arranger bank and the borrower firm in the five-year period prior to the beginning of our sample period (1998-2002). Past loans are positively associated with the likelihood that the bank will provide future loans to the same firm, which is consistent with the evidence in Bharath et al. (2007). We also control for the distance between the borrower and its potential lead arrangers by using a dummy variable that takes the value of one if the bank and firm are headquartered in the same geographic region (*Same Region Dummy*). We find evidence consistent with a home bias effect; i.e., borrowers tend to select local lead arranger banks. We also include a dummy variable for European banks to control for the special conditions of the European syndicated loan market (Carey and Nini 2007). We also control for bank characteristics such as rank in *The Banker*, size, and profitability.

Columns (2), (4), and (6) of Table 3 show estimates of a conditional logit model that includes firm and bank fixed effects. The fixed effects control for interdependence in the bank-firm pair observations between those for the same firm (whose decisions to borrow across banks are interdependent) and those for the same bank (whose lending decisions to different firms are also likely interdependent). The statistical and economic significance of the bank-firm governance links is barely affected.

## **2.2 Robustness and endogeneity**

We check the robustness of our findings to alternative specifications and methods. The results are presented in Table 4. First, we address the issue that smaller countries have fewer relevant

banks operating and therefore some of the bank-firm pairs may not be truly representative. Our criteria based on the volume of loans in each country, regardless of bank nationality, minimizes this problem by including local and international banks among the top 20 banks.<sup>13</sup> To check the robustness of our results, we implement several alternative bank-firm pair schemes. We first match each firm with the top 10 banks or top 5 banks (instead of the top 20 banks) operating in each country to address the concern that for small countries only the top banks matter. Alternatively, we restrict our analysis to a sample of firms from large countries, defined as those countries with more than 400 loans. Finally, we randomly draw 10 banks for each firm out of the top 20 banks in each country to sample more evenly across banks of different sizes. Columns (1)-(4) of Table 4 present the results of these alternative bank-firm pairs scheme. Again we find that bank-firm governance links positively affect the lead arranger choice.

Next, we run specifications that do not use the dichotomous variable of whether a firm has a loan from a bank, as in the logit model in Table 3. We run instead an ordinary least squares (OLS) regression whose dependent variable is the logarithm of the volume of loans from bank  $i$  to firm  $j$  and a Poisson regression whose dependent variable is the number of actual loans from bank  $i$  to firm  $j$ . We also run a Tobit model where the dependent variable is the share that loans from bank  $i$  to firm  $j$  represent of all loans received by firm  $j$ . The positive relation between bank-firm governance links and the intensity of lending from a linked bank is robust across all these alternative tests.

One concern with our findings is endogeneity of the presence of a bank as board member or

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<sup>13</sup> For example in the Netherlands, the top 20 banks includes four banks headquartered at the time in the Netherlands (ABN AMRO, ING, Rabobank, and NIB Capital Bank), six U.S. bank (Citigroup, JPMorgan Chase, Bank of America, Merrill Lynch, Goldman Sachs, and Morgan Stanley), three U.K. banks (HSBC, Barclays, and Royal Bank of Scotland), three French bank (BNP Paribas, Société Générale, and Credit Agricole), a German bank (Deutsche Bank), a Swiss Bank (Credit Suisse), a Belgian bank (Fortis), and an Italian Bank (Unicredit).

as an institutional equity holder. It may be the case that poorer quality firms tend to have governance links to banks to obtain easier access to credit. It may also be the case that the banking group has common information across its units that leads both its loan officer to lend and its fund manager to hold equity of the same firm, without one necessarily causing the other.

Our international sample allows us to use instrumental variables likely to determine a bank-firm governance link but not the choice of the lead arranger bank directly. The first is the degree of regulatory restrictiveness on the mixing of banking and commerce (or financial conglomerate restrictiveness) in place in each bank country. We use the index from the World Bank survey of banking regulations developed by Barth, Caprio, and Levine (2004).<sup>14</sup> As another bank-level instrument, we use a dummy indicating whether a bank is publicly listed instead of state-owned (e.g., WestLB in Germany) or a cooperative bank (e.g., Credit Agricole in France or Rabobank in the Netherlands), which are potentially more constrained than publicly listed banks from sitting on corporate boards or owning equity. We use other firm-level instruments likely to determine bank-firm governance links. We adopt the same variables used by Kroszner and Strahan (2001a) to explain banker representation on boards of non-financial firms, namely, firm size, short- and long-term leverage, tangible assets, and risk.

Table 5 presents the results of a bivariate logit model where the bank-firm governance link is treated as endogenous using the instrumental variables described above.<sup>15</sup> The first equation is a logit regression where the dependent variable is a dummy variable indicating the presence of a bank-firm governance link. Like Kroszner and Strahan (2001a), we find that banks have a higher presence in larger firms, and in firms with low leverage and risk. Thus, bankers are present in

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<sup>14</sup> In our sample, the index is lowest in France, the Netherlands, Spain, Switzerland, and the U.K. and highest in the U.S.

<sup>15</sup> Following Wooldridge (2010), we use a bivariate logit model, as two-stage logit model estimates are both inefficient and inconsistent.

healthy firms and not in firms that might require bank presence to access credit. This eases concerns over the endogeneity of the bank-firm governance link. We find that restrictiveness on the mixing of banking and commerce limits banks' presence on borrowers' board of directors and also that non-publicly listed banks have fewer governance links to borrowers.

The second equation is a logit regression where the dependent variable is a dummy for the presence of a loan for each bank-firm pair. This second equation uses the specifications in columns (1) and (3) of Table 3, although we obtain similar estimates using a conditional logit model. We find that bank-firm governance links (board and institutional holdings) affect bank choice even after controlling for the endogeneity of a bank's presence.<sup>16</sup>

In the Internet Appendix, we report a few more robustness checks. We further address the direction of causality between a banker presence in the borrower's board of directors and lending activity using panel data on bank-firm pairs for each year. We find that the addition of a banker to a board in the previous year leads to initiation of lending in the current year, but there is no evidence that a lending relation starts first and then a banker takes a board position in the year following. We also estimate a treatment effects model, as described in Greene (2008), for the number and volume of loans for each bank-firm pair.<sup>17</sup> We continue to find that bank-firm governance links affect bank choice. The Heckman lambda selection variable is negative and significant, which indicates that banks tend to build governance links with firms with (unobservably) higher credit quality, rather than poorer credit quality firms. This helps to alleviate concerns that endogeneity is driving our findings.

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<sup>16</sup> Since the dependent variables (loan dummy and bank-firm governance link dummy) are dummy variables, we cannot apply the tests of instrument relevance and validity. We run a standard instrumental variable model and the Hansen's overidentification tests confirm that the instruments meet the exclusion restriction.

<sup>17</sup> The treatment effects model considers the effect of an endogenously chosen binary treatment (i.e., bank-firm governance link) on another endogenous continuous variable. Thus, we use a continuous variable for the second-stage dependent variable (number of loans or log volume of loans as in Table 4) instead of the dummy variable (as in the logit model of Table 3).

### 2.3 Effect of financial crisis on credit supply

Previous studies find evidence of credit rationing during banking crises but firms that are geographically close and have prior relationships with banks are less affected by supply-side effects than other similar firms. De Haas and Van Horen (2011) show that cross-border lending dropped the most to borrowers from distant countries during the 2007-2008 financial crisis, while Puri, Rocholl, and Steffen (2011) find that the crisis induced a contraction in retail bank lending in Germany, although bank-depositor relationships helped to mitigate these supply-side effects. Schnabl (2011) find a reduction in cross-border lending to Peruvian banks after the 1998 Russian default.

Do borrowers with governance links to banks receive uninterrupted access to credit during a financial crisis? To answer this question, we test whether linked-firms are less likely to suffer a sudden stop in borrowing and face a lower drop in loans than non-linked firms after the start of the 2007-2008 financial crisis. The effect of the crisis on credit supply was dramatic, with banks on average reducing the volume of loans by about 70% during this period relative to the pre-crisis period.

To test whether a bank-firm link impacts the credit supply during the financial crisis, we estimate the following model:

$$\Delta Loan Activity_{i,j} = a_0 + a_1(Bank-Firm Link)_{i,j} + a_2X_i + a_3Y_{i,j} + \varepsilon_{i,j}, \quad (2)$$

where the dependent variable,  $\Delta Loan Activity$ , is the percentage change in the *volume of loans* or *number of loans* between bank  $i$  and firm  $j$  during the financial crisis compared to the pre-crisis period, or a dummy variable that equals one if bank  $i$  acts as lead arranger to firm  $j$  in the pre-crisis period but does not act as lead arranger in the crisis period (*sudden stop*). The crisis period is the period of time from the third quarter of 2007 to the fourth quarter of 2008 (July 1, 2007

through December 31, 2008). We estimate the model using OLS except for the *sudden stop* dependent variable for which we use a logit model. We control for other bank-level ( $X_i$ ) and firm-bank level variables ( $Y_{ij}$ ) as in equation (1). All explanatory variables are measured before the crisis period (i.e., as of December 2006). We follow De Haas and Van Horen (2011) and Schnabl (2011) and estimate the regression in first differences (in percentage), which we construct by collapsing and time-averaging the data for the months before and during the financial crisis.<sup>18</sup>

Table 6 presents the estimates of equation (2). We run specifications that include borrower firm industry dummies and dummies for the country of origin of the borrower firm and of the bank. Estimates in columns (1) and (3) show the effect of a bank-firm governance link on the probability that a bank will keep supplying credit during the crisis. The probability that a bank will keep acting as lead arranger is higher by roughly 10% if the bank has a board or institutional holding link with the borrower firm versus a firm with no such link.

Columns (5) and (7) of Table 6 show the results of models that use the percentage change in number of loans as a dependent variable. Columns (9) and (11) show the results using the percentage change in volume of loans. The bank-firm governance links coefficients are positive and significant in all specifications for board or institutional holding links. The estimates indicate that banks reduced the volume of loans to linked firms by about 6% less relative to non-linked firms during the crisis period.

We also estimate equation (2) including firm and bank fixed effects that control for credit demand at the firm level and unobserved bank characteristics. Columns (2) and (4) in Table 6

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<sup>18</sup> Collapsing the data smooths out variation and generates conservative standard errors (Bertrand, Duffo, and Mullainathan 2004). We obtain similar results when we use a specification in levels and interact bank-firm governance links with an indicator variable for the crisis period.

show the results for the *sudden stop* dependent variable, and columns (6), (8), (10), and (12) show the results for the change in the number and volume of loans. The magnitude of the bank-firm links coefficient is similar to the one with country and industry fixed effects.

Finally, in untabulated tests, we examine how the relation between bank-firm governance links and credit supply during the financial crisis differs for banks that received a government bailout and those that did not.<sup>19</sup> The effect of the crisis on credit supply should have been stronger for banks that were eventually bailed out as these banks were experiencing financial distress and capital constraints. An interesting question is whether these banks discriminate among borrowers according to governance links at a time when they were decreasing the credit supply. We find that the decrease in credit supply is stronger in the sample of bailout banks but bank-firm governance links attenuate quantity restrictions.

In summary, the evidence suggests that bank involvement in a firm's governance mitigates supply-side effects during a financial crisis. Bank-firm governance links seem to be particularly valuable at the time of a squeeze in credit to guarantee uninterrupted access to it.

### **3. Do Bank-Firm Governance Links Affect Loan Pricing and Non-Pricing Terms?**

We have provided evidence that when a bank plays a role in a firm's governance there is a higher probability that the bank will do future lending business with that firm. Now we examine the implications of a bank governance link for the pricing of loans and other contract terms. We perform these tests at the loan facility level. The sample consists of 17,181 bank-loan facilities for which we have bank-firm link variables, loan characteristics, bank variables, and borrower firm variables.

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<sup>19</sup> The list of banks that received bailout funds from the government during the crisis period is drawn from Laeven and Valencia (2010).

### 3.1 Loan pricing

We first test whether bank-firm governance links affect loan pricing. We estimate the regression of loan spreads:

$$\begin{aligned} Loan\ Spread_{i,j,k} = & a_0 + a_1(Bank-Firm\ Link)_{i,j,k} + a_2(Crisis\ Dummy) \\ & + a_3(Bank-Firm\ Link)_{i,j,k} \times (Crisis\ Dummy) \\ & + a_4Z_k + a_5X_i + a_6Y_j + \varepsilon_{i,j,k}, \end{aligned} \quad (3)$$

where the dependent variable, *Loan Spread*, is the all-in drawn spread of the loan facility, which includes the spread over LIBOR plus annual fees and up-front fees prorated over the life of the loan.<sup>20</sup> The explanatory variables of interest (*Bank-Firm Link*) are dummy variables that take the value of one if the bank has a link to the borrower firm as of the end of the year prior to the loan initiation through board membership (*Board Link Dummy*) or via equity holdings through its asset management division (*Institutional Holding Link Dummy*). We test each bank-firm link measure separately, and then consider the two bank-firm governance link variables jointly.

Regression equation (3) allows the effect of bank-firm governance links on loan spreads to differ between the periods before and during the 2007-2008 financial crisis. The crisis started in the third quarter of 2007 when two things happened: (1) two Bear Stearns hedge funds that invested in subprime mortgages filed for bankruptcy and (2) the credit default swap spreads of major banks increased sharply (Brunnermeier 2010). Our tests use a dummy variable (*Crisis Dummy*), which takes a value of one for loans initiated between July 1, 2007 through December 31, 2008. The crisis dummy measures the difference in loan spreads between the crisis period and the period before the crisis. We expect the crisis dummy coefficient to be positive because

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<sup>20</sup> In the Internet Appendix, we examine loan spreads without including fees as the dependent variables and find similar results.



borrower risk and the cost of bank funding both tend to go up during the financial crisis (Santos 2011). The bank-firm governance link coefficient (*Bank-Firm Link*) measures the difference in loan spreads between linked-borrowers and non-linked borrowers in the period before the crisis. Finally, the coefficient on the interaction between the bank-firm governance link and the crisis dummy (*Bank-Firm Link*  $\times$  *Crisis Dummy*) measures the difference in loan spreads between linked-borrowers and non-linked borrowers in the crisis period versus the non-crisis period.<sup>21</sup>

We control for loan characteristics ( $Z_k$ ), bank characteristics ( $X_i$ ), and borrower firm characteristics ( $Y_j$ ) in regression equation (3). The regressions also include borrower firm industry dummies, as well as dummies for the country of origin of both the firm and the bank. We adjust  $t$ -statistics for clustering at the firm and bank level.

Table 7 presents estimates of regression equation (3). In column (1) the coefficient on bank-firm governance links through board seats is significantly positive and implies that the presence of a bank member in the firm's board of directors is associated with an added 7 bps spread charged relative to a firm with no such link during the 2003-2006 credit boom. Column (1) also shows that, during the 2007-2008 financial crisis, the effect of a board link during the crisis is reduced by 20 bps [see interaction term coefficient in column (1)]; this implies that borrowers with a board link pay lower spreads by 13 bps ( $= 7 - 20$ ) than a borrower with no such link during the crisis period.

In column (3) of Table 7, we can see that an institutional holdings link is associated with 15 bps higher spreads charged to bank-linked borrowers during the 2003-2006 credit boom. The effect of an institutional holding link is reduced during the crisis, although the difference is not statistically significant. In this case, borrowers with an institutional holding link still pay higher

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<sup>21</sup> The results are not affected if we define the beginning of the crisis as the fourth quarter of 2007 (Santos 2011). These results are available in the Internet Appendix.

spreads by 8 bps (= 15 - 7) than a borrower with no such link during the crisis period.

In column (5) in Table 7, we include the two bank-firm governance links and confirm our main findings that bank-firm board links are associated with higher spreads before the crisis and lower spreads during the crisis, while bank-firm institutional holding links are associated with higher spreads both before and during the crisis. Table 7 also shows that the crisis dummy coefficient is positive, indicating that firms paid higher loan spreads during the crisis. The increase in loan spreads is greater than 30 bps, which is in line with estimates in Santos (2011).

The regressions control for other proxies of the bank-firm relationship such as past loan activity (Bharath et al. 2011) and geographical proximity. We find no evidence that past loans and proximity impact loan spreads after controlling for bank-firm governance links. The European bank dummy coefficient is negative and significant, which is consistent with the findings in Carey and Nini (2007). In all specifications in Table 7 we also control for borrower firm characteristics and other non-pricing loan terms. As expected, we find that spreads are narrower for larger firms and more profitable firms, while firm stock risk tends to widen spreads. We control for borrower credit quality using a set of bond ratings dummies. We find that loans with lower ratings tend to have wider spreads.

In terms of loan characteristics, we control for the following: (1) loan size; (2) whether the loan has collateral, is secured, or has a guarantor; (3) loan maturity; (4) covenants; (5) number of lenders; and (6) loan purpose and type dummy variables (not shown in Table 7 to save space).

Columns (2), (4), and (6) of Table 7 include firm (and bank) fixed effects. The firm fixed effects specification controls for unobserved sources of firm heterogeneity. Fixed effects methods solve “joint determination” problems in which an unobserved time-invariant variable simultaneously determines both loan spreads and the bank-firm governance link. It is equivalent

to looking only at both within-firm and within-bank changes in bank-firm governance links. We find that the effect of a bank-firm governance link is still positive and significant in the pre-crisis period. Consistent with the OLS regression results, the effects are substantially reduced during the crisis and even become negative in the case of board links, which implies that borrowers with a board link pay lower spreads compared to borrowers with no such link during the crisis period.

Our model of loan spreads accounts for a large set of controls for the borrower firm risk and credit quality. Since our controls for firm risk are mainly backward looking, we use the five-year senior credit default swap (CDS) spread as a predictor of firm credit risk and default probability. The CDS spread is a real-time indicator of changes in the credit quality of the borrower firms. We add the borrower's CDS spread at the end of the year previous to the loan initiation as a regressor in column (7) of Table 7. The sample for this model is smaller because is limited to firms with CDS spread data available in Datastream/Credit Market Analytics. The borrower's CDS spread coefficient is positive and significant, indicating that it contains additional information about the borrower's credit risk. More importantly, we continue to find that the bank-firm governance link coefficients are positive and significant, while the interaction variable *Crisis Dummy*  $\times$  *Board Link Dummy* is negative and significant.

Overall, we find that the loan pricing is *less* favorable to the firm during credit booms if a bank has board seats or institutional holdings. During the crisis period, however, we find something different. In support of the intertemporal smoothing of loan interest rates hypothesis, loan pricing is *more* favorable to a firm if the bank has a board seat during financial crises. Taken together with the results in Section 2.3, these results suggest that bank-firm board links can provide uninterrupted access to funding at more favorable spreads and may allow firms to avoid financial distress during financial crises. In the case of institutional holding links, the

benefit of the bank-firm link accrues more to the bank since there is no evidence that loan pricing is more favorable during the crisis. Thus, our findings suggest that the eagerness to help the firm at the times of financial crises is stronger in the case of board links than in the case of institutional holdings links.

### **3.2 Subsamples**

In Table 8, we estimate the model specification in column (5) of Table 7 for subsamples of firms. We first examine how the relation between bank-firm governance links and loan spreads differs for firms with and without access to public debt markets. Columns (1) and (2) present the results of the loan spread regressions estimated separately for the samples of firms with a public debt rating (rated firms) and firms without a rating (unrated firms). Chava and Purnanandam (2010) suggest that rated firms are likely to be less bank-dependent as they have access to public debt markets.<sup>22</sup> We find that the positive association between board links and loan spreads is significant only in the sample of unrated firms. Interestingly, the asymmetric effect during the crisis is significant only for unrated firms. Unrated firms with bankers on the board of directors are the ones that pay higher loan spreads during credit booms but then benefit from lower spreads during financial crises. Intertemporal smoothing of loan rates matters more for bank-dependent firms. Institutional holding links are associated with higher spreads for both rated and unrated firms and there is no evidence of intertemporal smoothing in this case.

We next examine the relation between bank-firm governance links and loan spreads for borrowers with different levels of credit risk. We use the five-year senior credit default swap (CDS) spreads as a measure of credit risk and classify firms whose CDS spread is above the yearly median as high CDS spread firms and firms whose CDS spread is below the yearly

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<sup>22</sup> We obtain consistent findings if we exclude speculative grade firms (i.e., ratings BB or below) from the group of rated firms.

median as low CDS spread firms.<sup>23</sup> The results in columns (3) and (4) in Table 8 show that banks charge higher spreads to linked firms but then smooth rates during the crisis only for the sample of high CDS spread firms. These findings indicate that the costs and benefits of bank-firm governance links mainly accrue to firms with higher levels of credit risk.

We then analyze whether the effect of bank-firm links and intertemporal smoothing of loan rates is more pronounced when borrowers use local banks as lead arrangers. This test can only be implemented in our worldwide sample of syndicated loans. In Table 8, we split the sample into loans where the bank and the firm are located in the same country (column (5)) and loans where they are based in different countries (column (6)). We find a positive relation between loan spreads and governance links in both samples in the credit boom period. The negative association between board links and loan spreads during the financial crisis is significant only if bank and firm are from the same country. We conclude that intertemporal smoothing of loan rates takes place when the geographic proximity between banks and borrowers facilitates the use of soft information. In the case of institutional holding links, we find higher spreads regardless of the location of banks and firms and there is no evidence of intertemporal smoothing.

Columns (7) and (8) of Table 8 present the results of the loan spread regressions separately for non-U.S. firms and U.S. firms. The positive relation between loan spreads and board links is positive and significant in both subsamples, while institutional holding links seems to matter only for U.S. firms. The 2007-2008 financial crisis had a bigger effect on U.S. banks and firms and therefore we only find significant evidence of intertemporal smoothing of loans rates in the subsample of U.S. firms in the case of board links (at the 5% level) and institutional holding links (at the 10% level).

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<sup>23</sup> We obtain similar findings when we split the sample by changes in CDS spread.

Finally, in columns (9) and (10) of Table 8 we examine the relation between bank-firm governance links and loan spreads depending on the level of distress a bank is facing during the crisis. We examine whether a bank received a government bailout and suspect that the effect of the crisis on loan spreads is stronger for banks that were eventually bailed out by governments as these banks faced higher capital constraints. We find that there is only evidence of intertemporal smoothing of loan rates in the sample of bailout banks, as shown by the negative and significant coefficient of the interaction variable *Crisis*  $\times$  *Board Link Dummy* in column (9). This indicates that firms with board links to distressed banks experienced a lower increase in loan spreads during the crisis than firms with no such link.

### **3.3 Endogeneity**

An important concern with our findings on loan spreads is the potential endogeneity of the bank-firm link. The evidence so far is consistent with the notion that banks with control rights are able to charge higher interest rates to connected firms during credit booms, but offer more competitive interest rates during financial crises. Without further investigation, we cannot conclude that a bank's position influences the loan spread. It could be that we find higher spreads in credit booms because banks tend to have governance links to poorer quality firms. This selection bias is indeed a concern because low quality firms would pay higher spreads, and banks may play a role in governance precisely when a firm is in financial difficulty.

We implement two methodologies to handle this endogeneity issue. The first method is an instrumental variables estimation using instruments that are correlated with the bank's involvement in firms' governance but do not affect directly loan spreads, except through this channel. We use two different variables as instruments for the existence of bank-firm governance links. The first is the index of regulatory restrictions on mixing banking and commerce from the

World Bank survey of banking regulations (Barth, Caprio, and Levine 2004) that has an impact on the likelihood of a bank-firm governance link. The second is a dummy variable indicating whether a bank is publicly listed. Privately held banks are typically more constrained in holding board seats and equity stakes.<sup>24</sup>

We employ two-stage least-squares (2SLS) methods using instruments for our endogenous variables. We use the fitted value of the first stage logit regression of the bank-firm governance link in the second-stage regression since the dependent variable – loan spread – is continuous. Wooldridge (2010) shows that estimating a logit equation for a discrete choice variable in the first stage and using the fitted value in the second stage regression (with a continuous dependent variable) leads to consistent estimates of the coefficients.

Table 9 presents results of the instrumental variables estimation of loan spreads. The first-stage regression results support the view that board links are negatively associated with the mixing banking and commerce regulation index and also that non-publicly listed banks have fewer governance links to borrowers. Institutional holding links, however, are positively associated with the mixing banking and commerce index. *F*-statistics (reported at the end of the table) indicate the rejection of the hypotheses that instruments can be excluded from the first-stage regressions, which suggests that the instruments are not weak.

The second-stage results (columns (2)-(3) and (5)-(6)) in Table 9 show that the presence of a banker on a firm's board of directors or as an institutional shareholder is associated with higher loan spreads before the crisis, correcting for the endogeneity of these bank-firm governance

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<sup>24</sup> In our sample, private banks are usually state-owned or cooperative banks. A potential concern is that government-owned banks charge subsidized (low) interest rates during the crisis period, which may affect our instrumental variable estimates. We obtain consistent findings when we estimate the instrumental variable models in Table 9 with a sample that excludes government-owned banks. These results are available in the Internet Appendix.

links. Moreover, we find that the effect of board links on spreads is significantly reduced during the crisis period. In contrast, firms with institutional holdings links do not seem to benefit from better loan pricing during the crisis and therefore these firms just pay the cost of the link. It is also important to notice that relative to the results in Table 7, the instrumental variable estimates indicate that the magnitude of the positive relation between loan spreads and links is stronger in the pre-crisis period, while the magnitude of reduction during the crisis is similar. Thus, there is stronger evidence of a cost to firms of bank links and weaker evidence of a benefit to firms.

In this specification, we have more instruments than endogenous variables, so we can test for the exogeneity of the instruments using overidentification tests. Results of Hansen's overidentification tests (reported at the end of Table 8) confirm the quality of the instruments, showing that they are not related to loan spreads in any other way than through their impact on the governance link. At the same time, the instrumental variables estimation results should be interpreted with caution, because the theoretical justifications for the instruments for bank-firm governance links is not very strong.

The results are robust to the use of a treatment effects model (see Internet Appendix), as described in Greene (2008), as an alternative to the instrumental variables estimation. The first stage is a treatment probit regression, where the dependent variable is a dummy variable indicating a bank-firm link. The first-stage results are consistent with the instrumental variables method results. The second-stage results again indicate that linked borrowers pay higher spreads during credit booms but tend to pay lower spreads during financial crises, especially when there is a link by representation on the board of directors.

The second alternative method is to limit the sample to firms that have at least one bank-firm governance link, so that we can compare loan spreads for firms that take loans both from linked



banks and non-linked banks. If the reason we find an interest rate increase is that banks have governance links in (unobservably) riskier firms, then these firms should pay the same interest rate when they borrow from one of these banks or from a bank that has no governance link with them. There are 203 firms in our sample that borrow from a bank with a board link and from a bank with no such link, and 548 firms that borrow from a bank with an institutional holdings link and from a bank with no such link. We estimate a model with firm fixed effects in order to get a within-firm comparison. In results reported in the Internet Appendix, we show that firms pay higher loan spreads when they borrow from a bank with a board link versus when they borrow from a bank with no board link in the period before the crisis. We also find that, during the financial crisis, firms pay lower spreads when they borrow from a bank with a board link. Additionally, firms pay higher loan spreads, both before and during the crisis, when they borrow from a bank that has an institutional holding link. These results show that the loan spread results are unlikely to be driven by selection effects.<sup>25</sup>

### **3.4 Non-pricing loan terms**

The role of a lead arranger bank in the borrower firm's governance could also potentially impact non-pricing loan terms, such as collateral, financial covenants, maturity, or amount. We investigate the relation between these non-pricing loan terms and bank-firm governance links in Table 10. The specifications are similar to those in Table 7 for loan spreads.

Column (1) of Table 10 presents the results of a probit model for the inclusion of collateral in the loan contract (*Secured*). There is no evidence that bank-firm links impact collateral requirements of the loan. Column (2) presents the results of a probit model for the inclusion of

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<sup>25</sup> We also obtain consistent findings using the propensity score matching methodology employed by Drucker and Puri (2005) and Bharath et al. (2011) to further address endogeneity concerns. These results are available in the Internet Appendix.

dividend restrictions in the loan contract, which is a form of financial covenant. There is no evidence that dividend restrictions would be alleviated if there is a governance link. Column (3) presents the results of a regression where the dependent variable is the logarithm of the loan maturity. We do not find evidence that maturity is extended; it is actually shortened if banks have an institutional holding link. Finally, column (4) presents the results of a regression where the dependent variable is the loan amount (as a percentage of total assets) granted to borrowers. Borrowers with governance links obtain larger loans than borrowers with no such links.

Table 10 also investigates the effect of the crisis on non-pricing loan terms. There is limited evidence that collateral requirement and dividend restrictions become more frequent during the crisis, while there is significant evidence of an increase in loan maturity. Furthermore, borrowers with bank-firm governance links have not been affected in a significantly different way from borrowers with no such links.

Overall, there is evidence that bank-firm governance links affect loan spreads, but there is no evidence of relaxing or tightening of non-pricing loan terms. The only exception is loan amounts (and to some extent maturity), as governance links seem to give access to larger loans.

To the extent that price and non-price terms of loans are jointly determined, the true effects of relationships on these variables may be obscured. To address this concern, we re-estimate the model specifications above for the spread, maturity, and collateral terms of a bank loan contract using an instrumental variable approach. As in Bharath et al. (2011), we assume a unidirectional relation between the price (spread) and non-price (collateral requirement and maturity) terms. In particular, we assume that while maturity and collateral affect each other (bidirectional relationship), spread is only affected by maturity and collateral (unidirectional relationship). We employ 2SLS methods using instruments for our endogenous variables following Bharath et al.

(2011). We use the default spread at the time the loan is made and the average spread of loans completed over the previous six months, as an instrument for loan spreads. We use asset maturity, which is a key factor that affects the debt maturity structure of corporations, as an instrument for loan maturity. Loan concentration (i.e., the ratio of loan amount to existing debt plus loan amount) is employed as an instrumental variable that affects collateralization of the debt.

Results in the Internet Appendix confirm the effect of bank-firm governance links on loan spreads controlling for the joint determination of maturity and collateral. The change of econometric specification produces some impact on the magnitude of the effects but we still find a positive effect of board links in the period before the crisis and a negative effect during the crisis period. There is a positive and significant effect of institutional holding links on loan spreads both before and during the crisis. In addition, there is some evidence that institutional holding links have a negative effect on loan maturity. The coefficients of loan terms and instruments are in line with those in Bharath et al. (2011).

### **3.5 Loan syndicate concentration**

Bank-firm governance links may also affect the number of lead arrangers and lenders in the loan syndicate. A bank-firm link may improve information flows between the bank and the firm, as the borrower may be inclined to reveal more information, and the bank itself has greater incentives to produce information. Recurring loan transactions and delivery of other financial services imply that non-transferable information can be accumulated in the bank-firm relation. If there is indeed an information advantage, we expect to find a higher level of loan syndicate concentration (i.e., connected borrowers use fewer lead arrangers than non-connected borrowers).

Columns (5) and (6) of Table 10 present the results of regressions where the dependent variables are the logarithm of the number of lenders and lead arrangers in each loan. We find that both the presence of a banker on a firm's board of directors and bank institutional equity stakes are negatively associated with the number of lead arrangers and lenders in the syndicate. There is no evidence, however, that affiliated institutional ownership increases loan concentration.

Columns (5) and (6) of Table 10 also investigate the effect of the crisis. There is evidence that the number of lenders significantly decreased during the crisis, while there is evidence of an increase in the number of lead arrangers. This is consistent with the evidence in De Haas and Van Horen (2011). Borrowers with governance links seem to have triggered an additional reduction in number of lenders, consistent with the idea that the syndicate concentration increased for the borrowers with access to credit in better terms during the crisis period.

Overall, borrowers with governance links to banks use fewer lead arrangers and lenders. This is consistent with the findings in Section 2 that bank-firm governance links make it more likely that a bank will be chosen as a lead arranger for future loans. The evidence here is also consistent with the idea that the linked bank is willing to engage in intertemporal smoothing of loan interest rates because it holds a large share of a firm's loans.

#### **4. Conclusion**

We provide evidence on the effects of bank-firm governance links in the syndicated loan market around the world. A large sample of loans enables us to examine the effects of banks' role in corporate governance through board seats and equity holdings via bank-affiliated institutional money managers. We find that during the 2003-2006 credit boom, banks lent more and charged higher loan spreads to firms in which they had control rights. During the 2007-2008 financial crisis, however, borrowers with board links to banks paid lower loan spreads than borrowers with

no such links. This evidence is consistent with intertemporal smoothing of loan rates. It suggests that a firm benefits from bank involvement in its governance through board representation during a financial crisis, but at the cost of paying higher loan spreads during normal times. In the case of institutional equity holdings links, borrowers with links paid higher loan spreads than borrowers with no such links both before and during the crisis, although the difference in spreads is lower during the crisis.

Our findings illustrate that universal banks play governance roles in companies, which has implications for financial intermediation. Few modern-day regulatory issues have been as controversial as relaxing the separation of investment and commercial banking. Unlike international regulations on bank capital requirements as in the Basel Accords, there is no international coordination on regulation of bank control over non-financial firms such as board seats or equity holdings through bank-affiliated asset management divisions.

Our evidence suggests possible conflicts of interest between the role of lender and the role of insider in a firm. Note, however, that firms could also benefit from governance links to banks if such links assure uninterrupted access to funding at competitive interest rates and if they allow firms to avoid financial distress during financial crises. Future work should further examine the role of universal banks in credit shock periods, especially given the upheavals in the banking industry during the 2007-2008 financial crisis.

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**Table 1**  
**Summary Statistics of Sample of Loans and Bank-Firm Governance Links**

This table describes the sample of syndicated loan facilities in DealScan for which we are able to obtain financial and market information on the borrower firm in Datastream/Worldscope. Financial borrowers (SIC 6000-6999) are excluded. The sample period is from January 1, 2003 to December 31, 2008. Panel A presents the number of loans, volume of loans, number of borrower firms, and number of loans with bank-firm governance links by country of the borrower firm. Panel B presents the same statistics for the top 30 banks in the loan sample.

Panel A: Summary Statistics by Country

Country	Number of Loans	Volume of Loans (\$ billion)	Number of Firms	Number of Loans with		
				Board Link	Institutional Holding Link	Insider Stake Link
Australia	515	88.0	39	39	59	0
Belgium	71	15.9	10	8	10	1
Brazil	130	44.8	13	0	11	0
Canada	233	73.5	50	22	39	0
Chile	63	7.0	13	0	4	0
Finland	140	35.3	19	9	13	4
France	1,408	336.0	74	150	65	13
Germany	892	327.0	45	93	48	16
Hong Kong	236	15.5	17	0	14	0
India	273	9.6	15	0	14	0
Italy	471	153.0	21	62	22	0
Japan	148	30.5	18	0	41	4
Korea (South)	320	14.8	26	6	53	4
Malaysia	17	1.6	11	0	3	0
Mexico	267	46.2	13	0	11	0
Netherlands	528	78.3	36	50	42	29
Norway	151	19.1	15	8	21	0
Singapore	94	9.9	11	0	17	0
Spain	1,025	201.0	37	28	20	1
Sweden	310	41.6	29	21	47	0
Switzerland	218	43.5	14	0	16	0
Taiwan	218	7.3	28	0	6	0
U.K.	1,627	241.0	136	40	181	0
U.S.	6,745	2,630.0	1,118	261	847	6
Other (18)	1,081	175.1	77	23	68	3
<b>Total</b>	<b>17,181</b>	<b>4,645.5</b>	<b>1,885</b>	<b>820</b>	<b>1,672</b>	<b>81</b>

Panel B: Summary Statistics by Bank

Bank Name	Country	Rank The Banker	Number of Loans	Volume of Loans (\$ billion)	Number of Firms	Number of Loans with		
						Board Link	Institutional Holding Link	Insider Stake Link
JPMorgan Chase	U.S.	2	2,186	961.0	649	138	178	0
Citigroup	U.S.	1	1,782	815.0	548	90	135	0
Bank of America	U.S.	4	1,580	497.0	574	41	271	6
Deutsche Bank	Germany	21	649	190.0	216	47	145	8
Royal Bank of Scotland	U.K.	6	793	173.0	251	8	29	0
BNP Paribas	France	10	764	168.0	296	77	139	3
Barclays Bank	U.K.	13	667	167.0	224	10	97	0
Credit Suisse Group	Switzerland	27	445	141.0	139	5	82	0
Wachovia Corporation	U.S.	18	518	131.0	189	9	85	0
ABN AMRO Bank	Netherlands	20	647	122.0	247	36	0	1
HSBC Holdings	U.K.	3	607	121.0	247	16	10	0
Société Générale	France	23	534	120.0	181	32	8	5
Credit Agricole Groupe	France	5	689	105.0	236	34	48	4
UBS	Switzerland	19	157	87.5	72	1	7	0
Santander Central Hispano	Spain	12	256	65.9	62	5	2	0
ING Bank	Netherlands	17	374	47.9	144	24	31	21
Mitsubishi Tokyo Fin.	Japan	7	266	47.8	119	0	2	4
Merrill Lynch Bank	U.S.	115	122	47.5	46	2	2	0
UniCredit	Italy	39	284	47.2	82	34	30	0
BBVA	Spain	33	254	46.2	87	18	8	1
Commerzbank	Germany	45	204	43.5	84	32	33	8
SunTrust Banks	U.S.	61	149	32.9	60	0	1	0
Groupe Banques Populaires	France	36	204	32.8	84	10	13	1
Fortis Bank	Belgium	34	186	31.1	89	11	23	7
Scotiabank	Canada	46	143	29.2	59	6	13	0
Wells Fargo	U.S.	16	143	29.1	60	0	27	0
Banca Intesa	Italy	30	87	25.8	28	14	5	0
Royal Bank of Canada	Canada	49	87	24.6	32	9	9	0
Nordea Bank	Sweden	44	145	23.4	66	10	18	0
Lloyds TSB	U.K.	26	162	21.1	73	8	17	0
Other (72)			2,097	251.0		93	204	12
Total			17,181	4,645.5		820	1,672	81

**Table 2**  
**Summary Statistics**

This table presents mean, median, standard deviation, minimum and maximum of each variable. The sample consists of 17,181 syndicated loan facilities in DealScan for which we are able to obtain financial and market information on the borrower firm in Datastream/Worldscope. Financial borrowers (SIC 6000-6999) are excluded. The sample period is from January 1, 2003 to December 31, 2008. Variables are winsorized at the bottom and top 1% level. Refer to Appendix A for variable definitions.

	Mean	Median	Standard Deviation	Minimum	Maximum
<b>Loan Variables</b>					
Loan spread	124.970	75.000	122.650	15.000	900.000
Rating AAA-AA dummy	0.021	0	0.143	0	1
Rating A dummy	0.129	0	0.335	0	1
Rating BBB dummy	0.184	0	0.387	0	1
Rating BB dummy	0.144	0	0.351	0	1
Rating B-C dummy	0.090	0	0.286	0	1
Loan amount	1,210	450	2,550	1	32,200
Secured dummy	0.235	0	0.424	0	1
Maturity	4.716	5.000	2.430	0.667	22.000
Dividend restriction dummy	0.206	0	0.404	0	1
Senior dummy	0.991	1	0.097	0	1
Guarantor dummy	0.082	0	0.275	0	1
Sponsor dummy	0.120	0	0.325	0	1
Number of lenders	13.782	11	10.973	1	77
Number of arrangers	5.719	3	5.583	1	27
Syndicated loan dummy	0.892	1	0.311	0	1
Corporate purpose dummy	0.274	0	0.446	0	1
Refinance dummy	0.255	0	0.436	0	1
Takeover dummy	0.116	0	0.320	0	1
Working capital dummy	0.099	0	0.299	0	1
Credit line dummy	0.425	0	0.494	0	1
Term loan dummy	0.265	0	0.441	0	1
Bridge loan dummy	0.011	0	0.103	0	1
<b>Bank-Firm Link Variables</b>					
Board link dummy	0.048	0	0.213	0	1
Institutional holding link dummy	0.097	0	0.296	0	1
Insider stake link dummy	0.005	0	0.069	0	1
Past loan relationship dummy	0.440	0	0.496	0	1
Same region dummy	0.707	1	0.455	0	1
Same country dummy	0.306	0	0.461	0	1
<b>Bank Variables</b>					
Bank ranking	21.768	10	36.998	1	500
Bank size	56,600	38,300	53,600	2,099	188,000
Bank return on equity	11.631	13.080	6.210	-3.840	22.830
European bank dummy	0.516	1	0.500	0	1
Bank publicly-listed dummy	0.960	1	0.196	0	1
<b>Borrower Firm Variables</b>					
Firm size	11,000	4,153	16,500	7	91,700
Total debt	0.329	0.307	0.179	0.000	1.000
Short term debt	0.229	0.169	0.228	0.000	1.000
Tangibility	0.361	0.331	0.226	0.006	0.899
R&D expenditures	0.009	0.000	0.021	0.000	0.111
Market-to-book	2.450	2.030	1.698	0.048	6.984
Profitability	0.065	0.054	0.104	-0.132	0.420
Interest coverage	10.560	7.026	10.635	0.725	46.087
Net working capital	0.696	0.363	0.963	-0.123	3.944
Stock volatility	0.337	0.282	0.225	0.000	1.702
Payout	0.504	0.208	1.140	-1.615	7.254
Credit default swap spread	132.116	48.500	245.113	1.300	2960.300

**Table 3**  
**Lead Arranger Bank Choice and Bank-Firm Governance Links**

This table presents results for a logit model of whether the existence of a bank-firm ( $i, j$ ) link through a board member or equity institutional holdings prior to the loan affects the probability that firm  $j$  chooses bank  $i$  as lead arranger in the syndicated loan market. For each borrower firm  $j$  we create a choice set of 20 potential arrangers (top 20 ranked by volume of loans in each country). The dependent variable is a dummy variable that equals one if bank  $i$  acted as lead arranger in at least one loan facility to firm  $j$ . Financial borrowers (SIC 6000-6999) are excluded. The sample period is from 2003 to 2008. Refer to Appendix A for variable definitions. Robust  $t$ -statistics adjusted for firm-level and bank-level clustering are in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Bank-Firm Link Variables</b>						
Board link dummy	1.377*** (10.10)	1.260*** (11.88)			1.153*** (8.66)	1.189*** (11.20)
Institutional holding link dummy			0.735*** (9.68)	0.570*** (11.24)	0.680*** (9.11)	0.534*** (10.47)
Insider stake link dummy	1.410*** (4.62)		1.440*** (4.53)		1.277*** (4.13)	1.884*** (3.82)
Past loan relationship dummy	2.014*** (14.35)		1.976*** (13.96)		1.957*** (13.65)	
Same region dummy	0.986*** (3.88)		0.950*** (3.33)		0.920*** (3.24)	
<b>Bank Variables</b>						
Bank ranking	-0.026*** (-4.89)		-0.023*** (-5.94)		-0.023*** (-6.03)	
Bank size (log)	-0.133 (-1.04)		-0.069 (-0.60)		-0.074 (-0.65)	
Bank return on equity	-0.002 (-0.10)		-0.005 (-0.27)		-0.005 (-0.29)	
European bank dummy	-0.459*** (-2.86)		-0.408* (-1.91)		-0.405* (-1.93)	
Borrower firm industry fixed effects	Yes	No	Yes	No	Yes	No
Borrower firm country fixed effects	Yes	No	Yes	No	Yes	No
Borrower firm fixed effects	No	Yes	No	Yes	No	Yes
Bank country fixed effects	Yes	No	Yes	No	Yes	No
Bank fixed effects	No	Yes	No	Yes	No	Yes
Observations	37,267	32,756	37,267	32,756	37,267	32,756
Pseudo R-squared	0.14	0.12	0.15	0.12	0.16	0.13

Impact of bank-firm governance links on the probability of being chosen as the lead arranger using columns (1) and (3)

	<u>Probability of being chosen (%)</u>
Board link dummy = 1	37.4
Board link dummy = 0	15.7
Change in probability	21.8
Institutional holding link dummy = 1	22.6
Institutional holding link dummy = 0	13.4
Change in probability	9.2

**Table 4**  
**Lead Arranger Bank Choice and Bank-Firm Governance Links: Robustness**

This table presents results of models that test whether the existence of a bank-firm ( $i, j$ ) link through a board member or equity institutional holdings prior to the loan affects the choice of lead arranger in the syndicated loan market. For each borrower firm  $j$  we create a choice set of 20 potential arrangers (top 20 banks in terms of volume of loans in each country). Columns (1)-(4) present results of a logit model of a dummy variable that equals one if bank  $i$  acted as lead arranger in at least one loan facility to firm  $j$  using the top 10 banks in each country, the top 5 banks in each country, a sample of countries with more than 400 loans, or a sample of randomly selected ten banks for each firm out of the top 20 banks in each country. Column (5) presents results of an OLS regression of log volume of loans from bank  $i$  to firm  $j$ . Column (6) presents results of a Poisson regression of the number of loans from bank  $i$  to firm  $j$ . Column (7) presents results of a Tobit regression (left censored at zero and right censored at one) of the share that loans from bank  $i$  to firm  $j$  represent of all loans of firm  $j$ . Financial borrowers (SIC 6000-6999) are excluded. The sample period is from 2003 to 2008. Regressions include borrower firm industry fixed effects and borrower firm and bank country fixed effects. Refer to Appendix A for variable definitions. Robust  $t$ -statistics adjusted for firm-level and bank-level clustering are in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Top 10 Banks	Top 5 Banks	Large Countries	Random Sample	Volume of Loans (log)	Number of Loans (Poisson)	Share of Loans (Tobit)
<b>Bank-Firm Link Variables</b>							
Board link dummy	1.218*** (9.73)	1.182*** (6.70)	1.110*** (7.72)	1.132*** (6.56)	4.953*** (7.21)	0.643*** (9.78)	0.249*** (7.57)
Institutional holding link dummy	0.623*** (7.60)	0.600*** (6.43)	0.711*** (8.35)	0.681*** (8.93)	1.795*** (5.54)	0.469*** (10.27)	0.140*** (6.24)
Insider stake link dummy	1.100*** (2.93)	0.794* (1.84)	1.347*** (2.93)	1.636*** (3.72)	4.821*** (4.44)	0.486* (1.71)	0.229*** (2.88)
Past loan relationship dummy	1.668*** (14.98)	1.620*** (13.14)	2.027*** (10.24)	1.938*** (13.21)	7.922*** (16.24)	0.924*** (14.46)	0.545*** (9.41)
Same region dummy	1.166*** (3.74)	0.884*** (2.95)	0.976*** (3.43)	0.933*** (3.66)	1.966*** (2.63)	0.852*** (17.14)	0.319*** (3.57)
<b>Bank Variables</b>							
Bank ranking	-0.014 (-1.33)	-0.022 (-1.41)	-0.030*** (-4.88)	-0.023*** (-6.06)	-0.040*** (-4.90)	-0.023*** (-15.23)	-0.005*** (-31.41)
Bank size (log)	-0.001 (-0.00)	-0.149 (-0.60)	-0.115 (-0.61)	-0.124 (-1.03)	0.217 (0.78)	-0.055 (-1.22)	-0.023 (-0.62)
Bank return on equity	-0.006 (-0.31)	0.007 (0.20)	-0.016 (-0.67)	0.003 (0.15)	-0.064 (-1.22)	-0.012** (-2.55)	-0.001 (-0.24)
European bank dummy	-0.549** (-2.57)	-0.161 (-0.46)	-0.348 (-1.59)	-0.440** (-2.25)	-10.603*** (-4.33)	-0.295*** (-4.86)	-0.145** (-2.41)
Observations	20,051	11,594	28,485	18,622	37,244	37,282	34,117
R-squared	0.15	0.15	0.15	0.15	0.15		0.13

**Table 5**  
**Lead Arranger Bank Choice and Bank-Firm Governance Links: Bivariate Logit**

This table presents results of a bivariate logit model predicting the existence of a bank-firm governance link and the existence of a loan for each bank-firm pair. Instrumental variables are used to correct for the endogeneity of bank-firm governance links through a board member or equity institutional holdings. Financial borrowers (SIC 6000-6999) are excluded. The sample period is from 2003 to 2008. The loan dummy logistic regressions include the same bank variables (coefficients not shown) as in Table 3. Refer to Appendix A for variable definitions. Robust *t*-statistics adjusted for firm-level and bank-level clustering are in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	1st Stage: Board Link	2nd Stage: Loan Dummy	1st Stage: Institutional Holding Link	2nd Stage: Loan Dummy
<b>Bank-Firm Link Variables</b>				
Board link dummy		11.099*** (5.40)		
Institutional holding link dummy				2.075*** (6.27)
Insider stake link dummy		1.430*** (4.01)		1.348*** (3.65)
Past loan relationship dummy		2.023*** (12.40)		2.002*** (11.71)
Same region dummy		0.930*** (3.61)		0.917*** (3.41)
<b>Instruments</b>				
Mixing banking-commerce regulation index	-0.274*** (2.99)		0.098 (0.69)	
Bank publicly-listed dummy	1.630** (2.09)		1.880*** (3.45)	
Firm size (log)	0.750*** (15.99)		0.573*** (12.38)	
Total debt	-0.740** (-2.38)		-1.279*** (-6.43)	
Short term debt	-0.302 (-1.12)		-1.333*** (-5.28)	
Tangibility	-0.456 (-1.27)		-0.596*** (-4.04)	
Stock volatility	-0.574* (-1.78)		-0.895*** (-4.85)	
Borrower firm industry fixed effects	Yes	Yes	Yes	Yes
Borrower firm country fixed effects	No	Yes	No	Yes
Bank country fixed effects	No	Yes	No	Yes
Observations	34,032	31,216	34,032	31,216
Pseudo R-squared	0.19	0.13	0.17	0.14
Impact of bank-firm governance links on the probability of being chosen as the lead arranger using columns (2) and (4)				
		<u>Probability of being chosen (%)</u>		
Board link dummy = 1		99.9		
Board link dummy = 0		13.6		
Change in probability		86.3		
Institutional holding link dummy = 1		38.8		
Institutional holding link dummy = 0		9.3		
Change in probability		29.5		



**Table 6**  
**Effect of Crisis on Bank Lending and Bank-Firm Governance Links**

This table presents results of regressions of changes on bank lending on a bank-firm governance link through a board member or equity institutional holdings in the crisis period versus the pre-crisis period. The crisis period is the period of time from the third quarter of 2007 to the fourth quarter of 2008. Columns (1)-(4) present results of a logit model of a dummy variable (sudden stop) that equals one if bank *i* acts as lead arranger to firm *j* in the pre-crisis period but does not act as lead arranger in the crisis period. Columns (5)-(12) present results of OLS and firm fixed effects regression of the percentage change in the volume of loans or number of loans between bank *i* and firm *j* in the crisis period compared to the pre-crisis period. Financial borrowers (SIC 6000-6999) are excluded. The sample period is from 2003 to 2008. Regressions include the same bank variables (coefficients not shown) as in Table 3. Refer to Appendix A for variable definitions. Robust *t*-statistics adjusted for firm-level and bank-level clustering are in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Logit Sudden Stop				% Change in Number of Loans				% Change in Volume of Loans			
<b>Bank-Firm Link Variables</b>												
Board link dummy	-0.671*** (-3.89)	-0.448** (-2.28)			0.053** (2.25)	0.032** (1.98)			0.065** (1.99)	0.064** (1.97)		
Institutional holding link dummy			-0.650*** (-6.21)	-1.273*** (-3.08)			0.056*** (4.52)	0.039** (2.04)			0.079*** (3.62)	0.064** (2.23)
Past loan relationship dummy	-0.108 (-0.83)		-0.093 (-0.71)		-0.004 (-0.22)		-0.006 (-0.34)		-0.027 (-1.06)		-0.031 (-1.17)	
Same region dummy	-0.510*** (-2.80)		-0.385** (-2.11)		0.054*** (4.24)		0.045*** (3.48)		0.084*** (4.02)		0.071*** (3.28)	
Borrower firm industry fixed effects	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Borrower firm country fixed effects	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Borrower firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Bank country fixed effects	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Bank fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	4,123	4,123	4,123	4,123	5,590	5,590	5,590	5,590	5,590	5,590	5,590	5,590
R-squared	0.15	0.16	0.15	0.16	0.105	0.722	0.109	0.722	0.083	0.676	0.085	0.677

Impact of bank-firm governance links on the probability of having sudden stop using columns (1) and (3)

	<u>Probability of sudden stop (%)</u>
Board link dummy = 1	69.0
Board link dummy = 0	79.7
Change in probability	-10.7
Institutional holding link dummy = 1	74.5
Institutional holding link dummy = 0	83.9
Change in probability	-9.4

**Table 7**  
**Loan Spread and Bank-Firm Governance Links**

This table presents results of OLS and fixed effects regressions of loan spread on a bank-firm governance link through a board member or equity institutional holdings. The sample consists of syndicated loan facilities in DealScan for which we are able to obtain financial and market information on the borrower firm in Datastream/Worldscope. Financial borrowers (SIC 6000-6999) are excluded. The sample period is from 2003 to 2008. Regressions include loan purpose and type dummies. Refer to Appendix A for variable definitions. Robust *t*-statistics adjusted for firm-level and bank-level clustering are in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	Fixed Effects	OLS	Fixed Effects	OLS	Fixed Effects	OLS
<b>Bank-Firm Link Variables</b>							
Board link dummy	6.822** (2.16)	4.995** (1.97)			6.720** (2.18)	5.068** (1.96)	8.123** (2.05)
Institutional holding link dummy			15.483*** (3.05)	9.789*** (3.38)	15.538*** (3.06)	9.834*** (3.39)	17.499** (2.34)
Insider stake link dummy	-6.741 (-0.64)	-1.729 (-0.24)	-3.846 (-0.38)	-0.060 (-0.01)	-5.953 (-0.57)	-1.489 (-0.21)	-1.524 (-0.07)
Past loan relationship dummy	0.448 (0.19)	0.541 (0.27)	0.764 (0.33)	0.673 (0.34)	0.629 (0.27)	0.556 (0.28)	3.849 (1.27)
Same region dummy	-0.742 (-0.27)	0.605 (0.34)	-0.656 (-0.23)	0.783 (0.44)	-0.813 (-0.29)	0.618 (0.34)	-1.550 (-0.42)
<b>Financial Crisis Variables</b>							
Crisis dummy	34.592*** (4.91)	33.239*** (5.62)	33.905*** (4.83)	32.884*** (5.50)	35.167*** (4.91)	33.680*** (5.57)	24.727** (2.40)
Crisis dummy x Board link dummy	-20.230** (-2.10)	-12.059** (-1.99)			-21.776** (-2.27)	-12.481** (-2.12)	-16.257** (-2.16)
Crisis dummy x Institutional holding link dummy			-7.496 (-0.65)	-8.980 (-1.17)	-6.358 (-0.55)	-8.152 (-1.07)	-10.335 (-0.73)
<b>Loan Variables</b>							
AAA-AA rating dummy	-50.876*** (-6.84)	-71.137*** (-3.38)	-52.222*** (-6.94)	-71.472*** (-3.39)	-51.837*** (-6.94)	-71.262*** (-3.39)	-49.530*** (-5.18)
A rating dummy	-41.949*** (-7.80)	-24.865*** (-2.99)	-42.323*** (-7.96)	-24.909*** (-3.00)	-42.407*** (-7.97)	-24.968*** (-3.00)	-33.829*** (-4.87)
BBB rating dummy	-30.959*** (-6.91)	-32.202*** (-3.65)	-30.779*** (-6.88)	-32.006*** (-3.63)	-30.872*** (-6.90)	-32.101*** (-3.64)	-28.891*** (-4.38)
BB rating dummy	10.595* (1.65)	-3.103 (-0.30)	10.600 (1.64)	-2.785 (-0.27)	10.544 (1.63)	-3.078 (-0.30)	13.193 (1.47)
B-C rating dummy	47.490*** (6.23)	5.050 (0.31)	47.553*** (6.25)	5.355 (0.33)	47.477*** (6.24)	5.085 (0.31)	45.030*** (3.49)
Loan amount (log)	-6.246*** (-3.99)	-4.216*** (-2.81)	-6.205*** (-3.99)	-4.178*** (-2.79)	-6.223*** (-3.99)	-4.184*** (-2.80)	-1.486 (-0.70)
Secured dummy	36.193*** (7.11)	12.705** (2.34)	36.208*** (7.11)	12.514** (2.30)	36.171*** (7.10)	12.506** (2.30)	44.093*** (5.26)
Maturity (log)	2.228 (0.79)	7.261** (2.44)	2.429 (0.86)	7.311** (2.47)	2.399 (0.85)	7.283** (2.46)	-0.686 (-0.19)
Dividend restriction dummy	0.473 (0.11)	5.414 (1.06)	0.337 (0.08)	5.392 (1.06)	0.349 (0.08)	5.429 (1.07)	6.920 (1.34)
Senior dummy	-371.985*** (-8.09)	-365.203*** (-8.45)	-370.992*** (-8.05)	-365.177*** (-8.44)	-371.113*** (-8.05)	-365.234*** (-8.44)	-374.241*** (-4.66)
Guarantor dummy	-9.823** (-1.97)	-6.185 (-1.04)	-10.214** (-2.04)	-6.436 (-1.08)	-10.262** (-2.06)	-6.444 (-1.09)	-11.766 (-1.52)
Sponsor dummy	82.538*** (10.94)	68.496*** (6.58)	82.629*** (10.96)	68.709*** (6.61)	82.679*** (10.98)	68.699*** (6.63)	87.228*** (6.38)
Number of lenders (log)	-3.810* (-1.69)	-4.571** (-2.09)	-3.656 (-1.62)	-4.499** (-2.07)	-3.677 (-1.63)	-4.509** (-2.07)	-2.315 (-0.79)
Syndicated loan dummy	2.648 (0.43)	-2.448 (-0.33)	2.636 (0.43)	-2.649 (-0.36)	2.675 (0.44)	-2.668 (-0.36)	5.606 (0.91)

**Table 7: continued**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	Fixed Effects	OLS	Fixed Effects	OLS	Fixed Effects	OLS
<b>Bank Variables</b>							
Bank ranking	0.056* (1.75)	-0.024 (-1.08)	0.061* (1.83)	-0.026 (-1.24)	0.061* (1.85)	-0.023 (-0.99)	0.092 (1.64)
Bank size (log)	5.009*** (3.56)	-5.250* (-1.83)	4.772*** (3.39)	-5.573* (-1.96)	4.841*** (3.43)	-5.468* (-1.92)	5.554*** (3.08)
Bank return on equity	-0.559*** (-3.10)	0.753 (1.15)	-0.600*** (-3.28)	0.754 (1.16)	-0.599*** (-3.28)	0.742 (1.14)	-0.774*** (-3.39)
European bank dummy	-25.900** (-2.19)	-8.126 (-1.46)	-25.272** (-2.15)	-7.659 (-1.40)	-25.064** (-2.12)	-7.597 (-1.37)	-15.068 (-1.51)
<b>Borrower Firm Variables</b>							
Firm size (log)	-6.448*** (-4.43)	-27.366*** (-4.42)	-5.813*** (-4.07)	-26.365*** (-4.26)	-5.869*** (-4.10)	-26.529*** (-4.29)	-5.869*** (-2.66)
Total debt	28.586 (1.46)	-7.406 (-0.32)	26.221 (1.36)	-9.108 (-0.40)	26.526 (1.38)	-9.361 (-0.41)	5.348 (0.27)
Short term debt	13.041 (1.24)	11.848 (1.05)	12.505 (1.20)	11.894 (1.06)	12.393 (1.19)	11.899 (1.06)	8.622 (0.56)
Tangibility	-5.435 (-0.67)	4.592 (0.12)	-5.636 (-0.70)	3.058 (0.08)	-5.692 (-0.71)	3.059 (0.08)	-3.686 (-0.29)
R&D expenditures	81.153 (0.96)	-86.828 (-0.36)	92.942 (1.10)	-76.011 (-0.32)	91.760 (1.09)	-84.116 (-0.35)	-36.276 (-0.34)
Market-to-book	-2.275** (-2.04)	-1.839 (-1.00)	-2.127* (-1.93)	-1.667 (-0.91)	-2.126* (-1.93)	-1.672 (-0.91)	1.758 (1.26)
Profitability	-47.633** (-2.55)	-46.675* (-1.66)	-46.652** (-2.51)	-48.132* (-1.72)	-46.659** (-2.51)	-48.149* (-1.72)	24.538 (0.78)
Interest coverage	-0.460** (-2.44)	-0.722*** (-3.03)	-0.463** (-2.46)	-0.729*** (-3.05)	-0.459** (-2.44)	-0.728*** (-3.05)	-0.915*** (-3.96)
Net working capital	-5.126** (-2.49)	-2.912 (-0.89)	-5.374*** (-2.65)	-2.927 (-0.90)	-5.363*** (-2.64)	-2.987 (-0.92)	0.453 (0.15)
Stock volatility	118.390*** (10.43)	109.746*** (6.22)	114.855*** (10.02)	108.492*** (6.16)	114.584*** (10.02)	108.232*** (6.15)	128.029*** (6.09)
Payout	-1.958** (-2.09)	-0.860 (-0.59)	-1.893** (-2.03)	-0.744 (-0.51)	-1.919** (-2.06)	-0.772 (-0.53)	-3.934** (-2.50)
Credit default swap spread							0.071*** (4.14)
Borrower firm industry fixed effects	Yes	No	Yes	No	Yes	No	Yes
Borrower firm country fixed effects	Yes	No	Yes	No	Yes	No	Yes
Borrower firm fixed effects	No	Yes	No	Yes	No	Yes	No
Bank country fixed effects	Yes	No	Yes	No	Yes	No	Yes
Bank fixed effects	No	Yes	No	Yes	No	Yes	No
Observations	17,181	17,181	17,181	17,181	17,181	17,181	7,536
R-squared	0.618	0.787	0.619	0.787	0.619	0.787	0.672

**Table 8**  
**Loan Spread and Bank-Firm Governance Links: Subsamples**

This table presents results of regressions of loan spread on a bank-firm governance link through a board member or equity institutional holdings. The sample consists of syndicated loan facilities in DealScan for which we are able to obtain financial and market information on the borrower firm in Datastream/Worldscope. Financial borrowers (SIC 6000-6999) are excluded. The sample period is from 2003 to 2008. Columns (1) and (2) present results for firms with rating and firms without rating. Columns (3) and (4) present results for firms with credit default (CDS) spread above and below the yearly median. Columns (5) and (6) present results for loans where bank and firm are located in the same country and in different countries. Columns (7) and (8) present results for non-U.S. firms and U.S. firms. Columns (9) and (10) present results for loans made by banks that received a bailout and banks that have not received a bailout. Regressions include the same loan, bank and borrower firm variables (coefficients not shown) as in Table 7 and borrower firm industry fixed effects and borrower firm and bank country fixed effects. Regressions also include loan purpose and type dummies. Refer to Appendix A for variable definitions. Robust *t*-statistics adjusted for firm-level and bank-level clustering are in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Rated Firms	Unrated Firms	High CDS Spread	Low CDS Spread	Firm-Bank from same Country	Firm-Bank from different Countries	Non-U.S. Firms	U.S. Firms	Bailout Banks	Non-Bailout Banks
<b>Bank-Firm Link Variables</b>										
Board link dummy	-0.999 (-0.30)	20.517** (2.49)	23.860*** (2.73)	0.025 (0.01)	8.735** (2.04)	12.737*** (2.67)	13.077*** (2.70)	9.254** (2.01)	10.089** (2.00)	6.786 (1.37)
Institutional holding link dummy	16.313*** (3.17)	14.286** (1.99)	20.995** (2.23)	-12.324* (-1.91)	23.250*** (4.28)	11.176* (1.65)	2.647 (0.35)	27.348*** (4.75)	21.162*** (3.58)	11.551* (1.78)
Past loan relationship dummy	2.488 (1.05)	-3.031 (-0.71)	3.628 (0.84)	3.291 (1.19)	4.530 (1.64)	0.171 (0.06)	-0.132 (-0.04)	6.437** (2.31)	0.477 (0.18)	3.801 (1.18)
Same region dummy	-1.914 (-0.62)	-2.328 (-0.47)	9.122* (1.87)	-11.709*** (-3.05)		1.611 (0.33)	1.995 (0.38)	-11.729 (-0.75)	-1.764 (-0.49)	-3.996 (-0.64)
<b>Financial Crisis Variables</b>										
Crisis dummy	38.579*** (4.73)	26.725** (2.14)	37.922** (2.35)	0.317 (0.04)	55.457*** (6.86)	23.875*** (2.59)	17.493** (2.07)	56.810*** (6.19)	42.195*** (5.79)	23.577** (2.52)
Crisis dummy x Board link dummy	-14.396 (-1.37)	-30.581** (-2.08)	-39.529** (-2.19)	2.634 (0.29)	-33.607*** (-2.75)	-14.244 (-1.14)	-7.076 (-0.59)	-32.216** (-2.38)	-33.904*** (-2.93)	2.934 (0.21)
Crisis dummy x Institutional holding link dummy	-6.402 (-0.56)	8.322 (0.26)	-58.412** (-2.45)	25.370* (1.87)	-9.809 (-0.70)	-22.662 (-1.35)	-28.870 (-1.34)	-19.815* (-1.67)	-6.173 (-0.46)	-12.359 (-0.75)
Credit default swap spread			0.046*** (2.65)	0.267*** (3.19)						
Observations	9,747	7,434	3,658	3,878	5,261	11,920	10,436	6,745	9,426	7,755
R-squared	0.672	0.606	0.668	0.595	0.632	0.631	0.646	0.585	0.617	0.630

**Table 9**  
**Loan Spread and Bank-Firm Governance Links: Instrumental Variables**

This table presents results of instrumental variables estimation using two-stage least squares (2SLS) that corrects for the endogeneity of bank-firm governance links through a board member or equity institutional holdings. The first stage is a logit regression predicting the existence of a bank-firm governance link, and the second stage is a regression where the dependent variable is the loan spread. The sample consists of syndicated loan facilities in DealScan for which we are able to obtain financial and market information on the borrower firm in Datastream/Worldscope. Financial borrowers (SIC 6000-6999) are excluded. The sample period is from 2003 to 2008. Regressions include the same loan, bank and borrower firm variables (coefficients not shown) as in Table 7. Regressions also include loan purpose and type dummies. Refer to Appendix A for variable definitions. Robust *t*-statistics adjusted for firm-level and bank-level clustering are in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	1st Stage: Board Link	2nd Stage: Loan Spread	2nd Stage: Loan Spread	1st Stage: Institutional Holding Link	2nd Stage: Loan Spread	2nd Stage: Loan Spread
<b>Bank-Firm Link Variables</b>						
Board link dummy		14.073** (2.13)	10.809** (2.05)			
Institutional holding link dummy					21.249** (2.46)	16.717*** (2.93)
Past loan relationship dummy		-0.408 (-0.25)	0.604 (0.35)		1.860 (1.16)	2.201 (1.36)
Same region dummy		0.298 (0.17)	0.792 (0.47)		3.317* (1.83)	1.736 (1.12)
<b>Financial Crisis Variables</b>						
Crisis dummy		36.250*** (14.22)	31.753*** (11.76)		32.606*** (12.69)	29.857*** (11.05)
Crisis dummy x Board link dummy		-16.215** (-2.24)	-13.597** (-2.17)			
Crisis dummy x Institutional holding link dummy					3.519 (0.53)	-5.305 (-0.87)
<b>Instruments</b>						
Mixing banking-commerce regulation index	-0.059*** (-3.70)			0.106*** (4.00)		
Bank publicly-listed dummy	0.161** (2.09)			0.220** (2.34)		
Borrower firm industry fixed effects	Yes	Yes	No	Yes	Yes	No
Borrower firm country fixed effects	No	Yes	No	No	Yes	No
Borrower firm fixed effects	No	No	Yes	No	No	Yes
Bank country fixed effects	No	Yes	No	No	Yes	No
Bank fixed effects	No	No	Yes	No	No	Yes
Observations	16,349	16,349	16,349	16,296	16,296	16,296
R-squared	0.15	0.61	0.79	0.19	0.59	0.78
F-statistic of instruments (p-value)	10.40 (0.000)			11.07 (0.000)		
Hansen overidentification test (p-value)		2.34 (0.310)	0.21 (0.645)		2.26 (0.323)	0.26 (0.608)

**Table 10**  
**Non-Pricing Loan Term and Bank-Firm Governance Links**

This table presents results of regressions of several non-pricing loan terms and loan syndicate concentration measures on a bank-firm governance link through a board member or equity institutional holdings. The sample consists of syndicated loan facilities in DealScan for which we are able to obtain financial and market information on the borrower firm in Datastream/Worldscope. Financial borrowers (SIC 6000-6999) are excluded. The sample period is from 2003 to 2008. Column (1) presents results of a probit regression of a dummy variable (secured) that takes the value of one if the loan is secured by collateral. Column (2) presents results of a probit regression of a dummy variable that takes the value of one if the loan terms include dividend restrictions. Columns (3)-(4) present results of OLS regressions of log of the loan maturity and loan amount (as a percentage of total assets). Columns (5)-(6) present results of OLS regressions log of the number of lenders and log of the number of lead arrangers. Regressions include the same loan, bank and borrower firm variables (coefficients not shown) as in Table 7 and borrower firm industry fixed effects and borrower firm and bank country fixed effects. Regressions also include loan purpose and type dummies. Refer to Appendix A for variable definitions. Robust *t*-statistics adjusted for firm-level and bank-level clustering are in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Probit Secured	Probit Dividend Restriction	Maturity (log)	Loan Amount	Number of Lenders (log)	Number of Arrangers (log)
<b>Bank-Firm Link Variables</b>						
Board link dummy	-0.027 (-0.21)	-0.011 (-0.10)	-0.009 (-0.32)	0.048*** (2.81)	-0.076** (-2.01)	-0.177*** (-5.11)
Institutional holding link dummy	0.032 (0.43)	0.067 (0.84)	-0.046** (-1.98)	0.039** (2.15)	-0.042 (-1.17)	0.019 (0.64)
Past loan relationship dummy	0.157*** (2.87)	-0.048 (-0.88)	0.074*** (4.34)	0.027** (2.27)	0.023 (0.94)	-0.135*** (-6.77)
Same region dummy	0.150*** (2.58)	0.129** (2.40)	-0.006 (-0.41)	-0.058*** (-2.76)	-0.077*** (-3.13)	-0.183*** (-7.43)
<b>Financial Crisis Variables</b>						
Crisis dummy	0.151 (1.09)	0.219* (1.75)	0.314*** (6.35)	0.025 (1.14)	-0.515*** (-7.11)	0.206*** (4.00)
Crisis dummy x Board link dummy	-0.074 (-0.24)	-0.269 (-0.64)	-0.088 (-1.24)	-0.010 (-0.29)	-0.212** (-2.11)	0.030 (0.39)
Crisis dummy x Institutional holding link dummy	0.031 (0.13)	-0.199 (-0.89)	0.088 (1.29)	-0.009 (-0.22)	-0.278** (-2.32)	-0.099 (-1.04)
Observations	17,017	13,073	17,181	17,181	17,181	17,181
R-squared	0.34	0.36	0.363	0.549	0.399	0.659

## Appendix A Variables Definitions

Variable	Definition
Panel A: Loan Variables	
<i>Loan dummy</i>	Dummy variable that takes the value of one if bank $i$ acted as lead arranger in at least one loan facility to firm $j$ over 2003-2008 (DealScan).
<i>Number of loans</i>	Number of loan facilities from bank $i$ to firm $j$ over 2003-2008 (DealScan).
<i>Volume of loans</i>	Volume of loan facilities in \$ millions from bank $i$ to firm $j$ over 2003-2008 (DealScan).
<i>Share of loans</i>	Fraction that volume of loan facilities from bank $i$ to firm $j$ represent of all loans of firm $j$ over 2003-2008 (DealScan).
<i>Loan spread</i>	Loan spread over LIBOR plus fees in the issue date in basis points (DealScan item All-in Spread Drawn).
<i>AAA-A rating dummy</i>	Dummy variable that takes the value of one if the senior bond rating of the firm at the close of the loan equals AAA or AA (DealScan).
<i>A rating dummy</i>	Dummy variable that takes the value of one if the senior bond rating of the firm at the close of the loan equals A (DealScan).
<i>BBB rating dummy</i>	Dummy variable that takes the value of one if the senior bond rating of the firm at the close of the loan equals BBB (DealScan).
<i>BB rating dummy</i>	Dummy variable that takes the value of one if the senior bond rating of the firm at the close of the loan equals BB (DealScan).
<i>B-C rating dummy</i>	Dummy variable that takes the value of one if the senior bond rating of the firm at the close of the loan equals B, CCC, CC or C (DealScan).
<i>Loan amount</i>	Loan facility amount in \$ millions (DealScan item Tranche Amount (Converted)).
<i>Secured dummy</i>	Dummy variable that takes the value of one if loan is secured by collateral (DealScan item Secured).
<i>Maturity</i>	Loan maturity in years (DealScan item Tenor/Maturity).
<i>Dividend restriction dummy</i>	Dummy variable that takes the value of one if loan has restrictions on paying dividends (DealScan item Covenants: General-Material Restriction).
<i>Senior dummy</i>	Dummy variable that takes the value of one if loan is senior (DealScan item Seniority).
<i>Guarantor dummy</i>	Dummy variable that takes the value of one if loan has a guarantor (DealScan item Borrower-Guarantor).
<i>Sponsor dummy</i>	Dummy variable that takes the value of one if loan has a sponsor (DealScan item Borrower-Sponsor).
<i>Number of lenders</i>	Number of lenders (DealScan item Number of Lenders).
<i>Number of arrangers</i>	Number of lead arrangers (DealScan).
<i>Syndicated loan dummy</i>	Dummy variable that takes the value of one if loan is syndicated (DealScan item Distribution Method).
<i>Corporate purpose dummy</i>	Dummy variable that takes the value of one if loan is for corporate purposes (DealScan item Primary Purpose).
<i>Refinance dummy</i>	Dummy variable that takes the value of one if loan is to repay existing debt (DealScan item Primary Purpose).
<i>Takeover dummy</i>	Dummy variable that takes the value of one if loan is to finance takeovers (DealScan item Primary Purpose).
<i>Working capital dummy</i>	Dummy variable that takes the value of one if loan is for working capital purposes (DealScan item Primary Purpose).
<i>Credit line dummy</i>	Dummy variable that takes the value of one if loan is a credit line (DealScan item Specific Tranche Type).
<i>Term loan dummy</i>	Dummy variable that takes the value of one if loan is a term loan (DealScan item Specific Tranche Type).
<i>Bridge loan dummy</i>	Dummy variable that takes the value of one if loan is a bridge loan (DealScan item Specific Tranche Type).

Panel B: Bank-Firm Link Variables	
<i>Board link dummy</i>	Dummy variable that takes the value of one if there is at least one common board member between the firm and the lead arranger bank (BoardEx).
<i>Institutional holding link dummy</i>	Dummy variable that takes the value of one if at least one institutional investor affiliated with the lead arranger bank has an equity position (of at least 1% of shares outstanding) in the firm (LionShares).
<i>Insider stake link dummy</i>	Dummy variable that takes the value of one if the lead arranger bank has an equity stake of at least 1% of shares outstanding in the firm (LionShares).
<i>Past loan relationship dummy</i>	Dummy variable that takes the value of one if there is a loan between the lead arranger bank and the firm over 1998-2002 (DealScan).
<i>Same region dummy</i>	Dummy variable that takes the value of one if the lead arranger bank and the firm are located in the same geographic region (DealScan).
Panel C: Bank Variables	
<i>Bank ranking</i>	Rank of lead arranger bank in the top 500 <i>The Banker</i> rankings in 2005 ( <i>The Banker</i> ).
<i>Bank size</i>	Market value of equity (book value in the case of non-publicly listed banks) in \$ millions of the lead arranger bank (Bankscope).
<i>Bank return on equity</i>	Return on equity of the lead arranger bank (Bankscope).
<i>European bank dummy</i>	Dummy variable that takes the value of one if lead arranger bank is headquartered in Europe (DealScan).
<i>Bank publicly-listed dummy</i>	Dummy variable that takes the value of one if a bank is publicly listed (Worldscope).
Panel D: Borrower Firm Variables	
<i>Firm size</i>	Sales in \$ millions (Worldscope item 01001).
<i>Total debt</i>	Total debt divided by total assets (Worldscope item 03255 / item 02999).
<i>Short term debt</i>	Short-term debt divided by total debt (Worldscope item 03051 / item 03255).
<i>Tangibility</i>	Net property, plant, and equipment divided by total assets (Worldscope item 02501 / item 02999).
<i>R&amp;D expenditures</i>	R&D expenditures divided by total assets (Worldscope item 01201 / item 02999).
<i>Market-to-book</i>	Market value of equity divided by book value of equity (Worldscope item 08001 / item 03501).
<i>Profitability</i>	Net income before extraordinary items divided by sales (Worldscope item 01551 / item 01001).
<i>Interest coverage</i>	EBITDA divided by interest expenses (Worldscope item 18198 / item 01251).
<i>Net working capital</i>	Current assets minus liabilities to total debt ((Worldscope item 02201 – item 03101 + item 03051) / item 03255).
<i>Stock volatility</i>	Annualized standard deviation of daily stock returns (Datastream).
<i>Payout</i>	Common dividends plus stock repurchases divided by operating income ((Worldscope item 05376 + item 03499) / item 01250).
<i>Credit default swap spread</i>	Five-year senior credit default swap spreads (Datastream/Credit Market Analysis).
Panel E: Other Variables	
<i>Mixing banking-commerce regulation index</i>	Index of the degree of regulatory restrictiveness on the mixing of banking and commerce that measures restrictions on the ability of banks to own and control nonfinancial firms and the ability of nonfinancial firms to own and control banks (Barth, Caprio, and Levine 2004).
<i>Crisis dummy</i>	Dummy variable that takes the value of one if the loan issue date is between July 1, 2007 and December 31, 2008.