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DOES BANK MONITORING MATTER TO BONDHOLDERS?

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Abstract

In this paper, we examine the existence of a cross-monitoring effect between bank debt and public debt by exploring the effects that loan defaults have on the lead arranger's perceived monitoring ability in the public debt markets. Generating a sample of major loan defaults among U.S. firms between 2002 and 2010, we empirically test the effects that these loans had on the bond returns of publicly traded firms that had existing loans made by the same lead lender as the defaulting firm. We show that the abnormal returns of these "affected firms" are negative and statistically significant. Moreover, these abnormal returns are economically significant – with a mean about -1% when measured over an eleven day window surrounding the announcement of the defaulting loan. Interestingly, we find that these results are even stronger if the defaulting firm had a strong and/or long-standing relationship with its lead lender. We also find that the negative bond market effect is particularly strong if the defaulting loan is an important deal to the lender, if it is a recently originated loan, and if the borrower has better governance, higher profitability and higher firm value in the loan origination year. In contrast, the negative bond market effect is weakened if the affected firms have more intensive analyst coverage and higher firm values. Taken together, these results strongly confirm the existence of a cross-monitoring effect between bank debt and public debt.

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1. Introduction

It is widely recognized that banks play an important and often distinct role in the capital allocation process. Compared to other providers of capital (most notably public debt holders and common stockholders), bankers often have unique access to key information about their borrowers, and stronger incentives to monitor their credit-worthiness over time. Recognizing the unique role of banks, a large literature has explored in considerable detail a number of important questions such as the market's response to changes in a firm's banking relationships and the various factors that influence a firm's choice of public and private debt.[1]

In addition to these fundamental questions, it has also been argued that there are important "cross monitoring" benefits between various types of debt claimants. These benefits arise when the disciplinary effect and information production of a particular claimholder are valuable to other claimholders. For example, Booth (p. 27, 1992) puts forward the idea that, "the cross-monitoring hypothesis predicts that one contract may have lower monitoring costs as a result of information produced through monitoring by another claimant." Theoretical studies on the role of banks (and other private lenders) suggest that banks, compared to public debt holders, have significant comparative advantages in monitoring efficiency (e.g. Diamond, 1984; Boyd and Prescott, 1986) due to superior access to private information (Fama, 1985), and the efficiency and flexibility in restructuring and renegotiation (Berlin and Loyes, 1988; Gertner and Scharfstein, 1991; Denis and Mihov, 2003) and more concentrated ownership of debt claims (Diamond, 1991; Houston and James, 1996)[2]. The combination of these factors increases the control banks exert over the investment and operational decisions of the borrower, which in turn, reduces adverse selection and moral hazard problems associated with external financing (Houston and James, 1996).

If the combination of concentrated holdings, effective control, and superior access to information makes banks much more effective monitors than public bondholders in deterring risk shifting activities and mitigating agency costs of debt, then the presence of bank monitoring might send a positive signal to other potential claimants (e.g. bondholders) and possibly reduce their own need to collect duplicate information. If so, bank debt may make it easier and/or cheaper for firms to raise other types of capital. Despite its intuitive appeal, there have been been very few studies directly testing the cross monitoring hypothesis, and the existing evidence is mixed. Datta, Iskandar-Datta and Patel (1999) demonstrate that borrowers pay significantly lower yield spreads when they issue public debt for the first time if they have an established banking relationship. These findings support the cross-monitoring hypothesis, and suggest that public bondholders take into account the benefits of bank

1 Theoretical work highlighting the unique role of banks dates back to Campbell and Kracaw (1980), Diamond (1984), Ramakrishan and Thakor (1984) and Fama (1985). Subsequent empirical work also demonstrates the important and distinct role of bank lending. This work includes Mikkelson and Partch (1986), James (1987), Lummer and McConnell (1989), Shockley and Thakor (1992), and Billett, Flannery and Garfinkel (1995).

2 In contrast, the diffuse ownership of public debt causes free rider problems and weakens individual bondholders' incentives to engage in costly information production and monitoring. Even if many bondholders were willing to monitor, the monitoring itself would be inefficient as it would involve unnecessary duplication of monitoring costs (Houston and James, 1996; Lin et al., 2013).

monitoring. In contrast, Booth (1992) tests the debt cross-monitoring hypothesis by examining bank loan spreads for firms with and without public debt. He reports that firms with public debt command lower loan spreads and concludes that the cross-monitoring benefits from public debt reduce the monitoring costs for bank debt.

In this paper we look at this issue from a different perspective, and consider what happens when events occur that call into question the value of bank monitoring. Specifically, we explore the spillover effects that result whenever a key bank borrower declares bankruptcy. Such an event may have an adverse effect on the lending bank's reputation for effective monitoring, which may dramatically reduce the perceived cross-monitoring benefit. If so, this reduction creates a potential channel in which a firm's bankruptcy generates contagion effects throughout the financial system.

When evaluating the spillover effects of a loan default, there is limited value from looking at the price changes of the public bonds of the defaulting firm, since the loan default would itself directly affect the prospects of the bonds being paid in full, and the corresponding expected drop in the value of the outstanding bonds would occur regardless of any cross-monitoring effects. To disentangle these issues, we employ an innovative empirical strategy where we look instead at the impact that the loan default has on the bonds of other companies that have outstanding loans with the same lead lender as the defaulting firm. If we find evidence that the bond prices of these "affected" firms drop significantly around the announced loan default, then this would suggest that the public bond market is revising downward the perceived cross-monitoring benefits that are being provided by loans from the issuing bank. By looking at the abnormal bond returns of other companies in the loan portfolio of the same lead lender (i.e. the affected firms), we also alleviate endogeneity concerns related to reverse causality, since it is very unlikely that the bond market abnormal returns of the affected firms would drive the bankruptcy of the defaulted firm. It is also unlikely that the omitted characteristics (which might cause the default) of the defaulted firms would affect the bond market abnormal returns of the affected firms. Consequently, our study proposes a clean setting to examine the cross monitoring hypothesis.

In our analysis, we calculate the return of the most frequently traded bonds among the affected firms over an eleven day period that extends from five days prior to the loan default to five days after the loan default. Focusing on the most frequently traded bonds over a longer event window enables us to mitigate concerns about illiquidity. Following Bessembinder et al. (2009), we use a matching portfolio approach to calculate the abnormal bond returns of the affected firms. More specifically, the abnormal returns are calculated as the difference between the return of the affected bond and the average return of a portfolio of bonds trading the same day with similar bond rating and time to maturity.

We find that across various specifications, the abnormal returns of the affected bonds are significantly negative over the eleven-day period surrounding the loan default. These abnormal returns are also economically significant – with a mean about -1%.[3] In our setup, we first also control for the characteristics of the defaulting firm as well as the importance of the defaulted loan to the underwriting lead bank (measured by the ratio of the size of the defaulted loan to the defaulted firm divided by the average size of the lead bank's loan portfolio). In addition, we control for the historical strength of the banking relationship (measured using the total number of loans between the bank and the defaulting borrower over the prior five years, and a similar measure based on the dollar amount of these loans). Here we find there is a negative and statistically significant link between each of these measures and the abnormal returns of the affected bonds. These findings confirm that there is greater damage to the cross-monitoring benefits if the defaulting firm was an important client of the underwriting bank. We also find that the negative bond market effect is particularly strong if the defaulting loan is an important deal to the lender, if it is a recently originated loan, and if the borrower has better governance and higher profitability at the loan issuance date. In contrast, the negative bond market effect is weakened if the borrower has higher growth opportunities and higher asset substitution risks.

We also perform additional tests where we instead control for the strength and duration of the banking relationship between the underwriting bank and the affected firms. Here, we generally find that there is a greater drop in the abnormal returns if the affected firm is an important client of the bank that underwrote the defaulting loan. Notably, however, these results are not as strong as the linkages between the abnormal returns and the relationship between the lead bank and the defaulting firm. Altogether, these findings suggest that the bond market is particularly concerned when the lead lender makes a bad loan to a firm in which it has a strong and/or long-term relationship. In particular, these types of loan defaults lead market participants to question the bank's overall ability to monitor credit quality, which in turn spills over to affect valuations in the public bond market. In a final set of tests, we re-run results separately for sub-samples of firms that are divided according to the strength of the prior banking relationship of the defaulted firm, and for a sub-sample that excludes affected firms that operate in the same industry as the defaulted firm. In each case, the underlying robustness of the main results is confirmed.

Overall, our results provide insights for three important areas of the literature. First, they add to our knowledge of the cross-monitoring benefits of bank lending. While a number of theoretical papers have surmised that public bondholders benefit from the information provided via bank lending, it has been somewhat of a challenge to find ways to directly test these effects. The notable exceptions are the earlier papers by Booth (1992) and Datta, Iskandar-Datta and Patel (1999), where the empirical evidence is mixed. Our paper builds upon the existing literature in a number of different ways. By looking at the effects of loan defaults on affected firms, we are able to generate a much larger sample and able to focus directly on the bond market's response to situations where the value of bank monitoring comes into question. In this regard, our results suggest that cross-monitoring benefits

[3] In a recent study, Lin et al. (2011) document that the average monthly excess return for corporate bonds (adjusted by monthly T-bill rate) is about 0.161%. In another recent study, Jostova et al. (2013) use TRACE dataset and document a 0.61% average monthly raw return for corporate bonds. Based on these recent studies, a 1% change in abnormal bond returns during the eleven-day period is quite substantial.

from bank loans reduce the monitoring costs for public debt, but they also demonstrate that public bondholders specifically take the lead bank's underwriting track record into account when assessing the value of these effects. Once again, by looking at the abnormal bond returns of other companies in the loan portfolio of the same lead lender (i.e. the affected firms), we also mitigate the concern that the findings are driven by endogeneity problems resulting from reverse causality and omitted variables. Moreover, our anlaysis uses the Dealscan database to capture much more precise measures related to the banking relationship and we are able to use the recently available daily TRACE data to estimate the abnormal bond returns more precisely (Bessembinder and Maxwell, 2008). As mentioned above, we consistently find that lending relationship and other firm and loan characteristics have a direct influence on how the bond market responds to loan defaults. By documenting the cross-monitoring benefits from bank loans to public debt, our study also contributes to the literature examining firms' choice between public debt and private debt (e.g. Houston and James, 1996; Denis and Mihov, 2003; Lin et al., 2013).[4]

Our paper also contributes to the growing literature on corporate bond market returns and the various factors that influence bond-holder wealth, (e.g. Billett, King and Mauer, 2004; Liu Shi, Wang, Wu, 2007; Bessembinder et al., 2009; Easton, Monahan, and Vasvari, 2009; Francis, Hasan, John, Waisman, 2010; Ellul, Jotikasthira and Lundblad, 2011; Lin, Wang, Wu, 2011) by documenting how lead bank monitoring affects the market value of public bonds. It also documents the risk transmission from the private credit market to the public debt market, which in turn provides further insights into how bankruptcy effects are transmitted throughout the financial system. By doing so, the paper also adds to the literature that has focused more broadly on the various types of spillover effects within the financial system (e.g. Lang and Stulz, 1992; Hertzel, Li, Officer and Rodgers, 2008).

The rest of the paper proceeds as follows. Section 2 outlines the data and the methodology used to construct our sample. Our empirical findings are reported in Section 3 and Section 4 concludes.

2. Data and Sample Construction

Our empirical analysis is primarily based on data related to a sample of defaulted and affected loans, and bond market data that is used to calculate the abnormal returns of these affected firms in the event period surrounding the loan default dates. These data are merged with other data related to firm characteristics information that are collected from CRSP, Compustat, I/B/E/S and Thomson Reuter 13(F). The sample period is 2002-2010. Below we describe in more details the data sources and methods used to collect both our sample of defaulted and affected loans, and the corresponding bond returns of the affected firms.

[4] See Kale and Meneghetti (2010) for a recent review of this literature.

2.1 Loan Data

We obtain loan data from Loan Pricing Corporation's (LPC) Dealscan database. Dealscan provides detailed information on loan contracts for U.S. and foreign companies. From this database, we extract information such as the lead arrangers, loan amount, maturity of the loan, and covenants.

We use two bankruptcy-related databases to isolate the loans made to bankrupt firms. These sources are (1) the website www.bankruptcydata.com (BD); (2) Moody's Default and Recovery Database (MDRD). We merge the two bankruptcy samples from BD and MDRD and manually match the company names in our bankruptcy data with the firm names in Compustat. For each bankruptcy filing, we have information on the company name, company identifier (GVKEY) and bankruptcy date.

Next, we search for the bankrupt firm in the Dealscan database to identify the defaulted loan facilities. Here we use the Compustat-Dealscan link provided by Michael Roberts and WRDS (Chava and Roberts, 2008) to match the bankrupt firms with their loan facilities reported in Dealscan. For each bankrupt firm, we categorize its loan facility as a defaulted loan if the bankruptcy announcement date is between the loan origination date and maturity date.

A syndicate of lenders typically finances the loans. From Dealscan, we are able to identify the lead arranger for each defaulted loan. Since some lead arrangers are subsidiaries of bank holding companies, we identify the lead bank at the ultimate parent level for each loan facility. For some loans, there are multiple lead arrangers. In these instances, we separate the facility observation with more than one lead arranger into several observations, with each observation corresponding to one lead arranger.

Since our main empirical strategy is to test the cross-monitoring effect through investigating the spillover effects of defaulted loans, we search the Dealscan database to identify all other outstanding non-defaulted loans made by the lead banks of defaulted loans. Specifically, the affected loans are constructed as follows. First, the lead arrangers of defaulted loans are matched back to Dealscan, which provides the list of non-defaulted loans made by each of these lead arrangers. Second, we remove the non-defaulted loans that were not outstanding at the time of the bankruptcy filing based on the facility start date and end date. We are left with a list of all affected loans that correspond directly to each of the defaulted loans.

2.2 Bond Data

The bond data are assembled from several sources: the Trading Reporting and Compliance Engine (TRACE), the National Association of Insurance Commissioners (NAIC) database, and the Fixed Investment Securities Database (FISD).

The TRACE database contains price, time and size of transactions for publicly traded over-thecounter (OTC) corporate bonds. The TRACE database was established in July 2002 to improve transparency in the corporate bond market. Through several phases of expansion, Initially (Phase I), TRACE covered about 500 U.S. investment-grade corporate bonds with an original issue size of at least $1 billion. On March 1, 2003 (Phase II), TRACE expanded its coverage of transactions to include bonds rated A and above with issue size greater than $100 million and 120 Baa bonds with issue size less than $1 billion. On October 1, 2004 (Phase III), the database was further expanded to cover all publicly traded corporate bonds. TRACE has covered transactions of most publicly traded bonds since October 1, 2004. The only trades not included in the TRACE database are those executed through exchanges, most of which occur on the NYSE's Automated Bond System. As less than 5% of all bonds are listed on the NYSE, the current TRACE database contains the vast majority of corporate bond trades in the US fixed-income market.

Beginning in January 1994, the NAIC database covers all transactions of publicly traded corporate bonds by life and property and casualty insurance companies and health maintenance organizations (HMOs). The Flow of Fund accounts published by the Federal Reserve Bank show that about one-third of outstanding corporate bonds are held by insurance companies. The NAIC database covers a substantial amount of corporate bond transactions that are adequately representative of transactions in the corporate bond market (see Campbell and Taksler, 2003).

The FISD database includes issuance information for all fixed-income securities that have a CUSIP and those likely to receive one soon. It contains issue- and issuer-specific information, such as coupon rate, maturity, issue amount, provisions and credit ratings for corporate bonds maturing after 1989.

TRACE and NAIC provide transaction data of corporate bonds, which are used for constructing the daily bond returns. The TRACE database covers corporate bond transactions for a relatively short horizon. Also, initially TRACE includes only a small subset of investment-grade corporate bonds, which are not representative of the whole market. To reduce the small-sample bias in parameter estimates, we merge the TRACE with NAIC transaction data to expand the sample size. If transactions of the same bond are covered in both data sets, we keep only those reported by TRACE. We follow the data screening procedure in Bessembinder, Kahle, Maxwell, and Xu (2009) to eliminate cancelled, corrected, and commission trades.

We clean the dataset as follows. We eliminate data for bonds with a maturity less than one year because liquidity for these issues is low, which subjects them to high pricing errors. To prevent the confounding effects of embedded options, we exclude callable, puttable, convertible and sinking fund bonds, as well as bonds with a floater or odd frequency of coupon payments. We also drop bonds whose rating we cannot identify. We employ primarily the Moody's rating, but if it is unavailable, we use the Standard and Poor's (S&P) rating when possible.

To minimize the possible impact of illiquidity, we select the most frequently traded bonds for the affected loan/firm around each loan default event. Since TRACE covers the vast majority of corporate bond trades, for some firms (e.g. American International Group, General Electric Company, JP Morgan Chase & Co., and Caterpillar, Inc.) there are a lot of eligible bonds available. Where a choice of highly frequently traded bond is available, we select bonds that are trading at a price that is relatively close to par. We prefer par bonds since this helps avoid imperfect arbitrage considerations.

The daily corporate bond return as of time *t* is computed as follows:

$$r_t = \frac{(P_t + AI_t) + C_t - (P_{t-1} + AI_{t-1})}{P_{t-1} + AI_{t-1}} \tag{1}$$

where P_t is the price, and AI_t is accrued interest on day t. C_t represents any coupon payments made on day *t*. In constructing daily returns from TRACE and NAIC data, we use the last transaction price of the day as the daily price, which is then used to calculate the daily return.

One concern is the relative lack of liquidity in the bond market. Although we selected the most frequently traded bonds, there are still some days the bonds were not traded, in which case the returns for those days were set as missing. The return following non-trading days was calculated based on the previous non-missing price, the number of days (K) between the two non-missing days (to calculate the accrued interest), and that day's price, and then divided by the days to scale the return to daily return. $r_t = \frac{1}{K} \times \frac{(P_t + AI_t) + C_t - (P_{t-k} + AI_{t-k})}{P_{t-k} + AI_{t-k}}$

The two primary risk factors in the bond market are default risk and time-to-maturity (Fama and French 1993). In order to construct the matching portfolios, we classify bonds into four rating groups: AAA/AA, A, BBB, and below BBB and three time-to-maturity groups: short (shorter than 5 years), medium (5-10 years), and long (longer than 10 years). For each bond included in our final sample, we created matching portfolio based on bond rating and time-to-maturity. We use these matching portfolios' return as the expected return for the bond in our sample. Finally, the abnormal returns are calculated as the difference between the observed return and the expected return.[5]

To mitigate the illiquidity concern, we focus on the accumulated returns over an 11-day period surrounding the announced loan default. To be included in our final sample, the bond must have transactions at day t-5 and day t+5. We can then calculate the 11 days accumulated abnormal return based on the changes in transaction prices between day t-5 and day t+5.

[5] As suggested by Bessembinder et al. (2009), we used three methods to estimate the expected returns: a mean-adjusted model, matching portfolio models, and factor models to calculate the abnormal bond returns. The results were qualitatively similar using each approach. In the interest of conciseness, we only report the results by using matching portfolio models.

2.3 Measuring the Strength of Banking Relationships and Loan Characteristics

The key independent variable we employ is *Ratio*, a continuous variable that identifies the importance of the defaulted loans to the lead arrangers. To construct this variable, we aggregate for each year, all of the defaulted loans to each defaulted firm for each lead bank. We also calculate the annual average outstanding loans for each lead bank. Specifically, *Ratio* is calculated as the total defaulted loan amount lent by the syndicates with lead arranger j and outstanding to firm i at the bankruptcy year (defaulted loan size) divided by the average outstanding loan amount syndicated by lead bank j over the past two years (lending size). The variable is expressed in percentage. Arguably, the default of an important loan casts more doubt about the bank's ability to screen and monitor borrowers. We therefore expect a more profound spillover effect for defaults of important loans (i.e. loans with a higher *Ratio* value).

We also include the number of covenants (*Covenant*) as an explanatory variable. The existing literature examines the impact of covenants in mitigating both the agency costs of debt and shareholder incentives to engage in value-reducing risk shifting (e.g., Jensen and Meckling 1976; Smith, and Warner 1979; Smith 1993). Since the agency costs of debt are generally thought to be inversely related to the financial condition of the firm, covenants are expected to be more restrictive when banks lend to the least creditworthy and observationally riskier borrowers (e.g. Berlin and Mester (1992), Billett, King, and Mauer (2007), and Demiroglu and James (2010). Arguably, the default of a borrower with intensive covenants might signal the banks' inability to effectively monitor. On the other hand, the default of such a borrower might be less of a surprise to the market and the spillover effect might therefore be less profound. Consequently, the links between covenants and the size of the spillover effect is ultimately an empirical question. The other loan characteristics we consider include loan age (measured before the default event) and relationship lending. Specifically, we construct a dummy variable "*Recent Loan*", which is equal to one if the defaulted loan is a recently originated loan (within 3 years), and zero otherwise. Intuitively, defaults on the most recently originated loans will be a more informative signal to market participants (i.e. bondholders of the affected firms) about the bank's screening and monitoring ability. In contrast, the defaults of loans originated a long time ago will be less informative, as they might simply reflect the credit risks assessment and control ability at that time (Murfin, 2012). Indeed, we would expect that monitoring ability might change over time because of shifts in technology, employee turnover and institutional changes such as credit information sharing (Barth et al., 2009). We therefore expect that the spillover effect would be more profound for defaults of recently originated loans.

Following Lin et al. (2012), we construct two alternative measures of the strength of the relationship between the defaulted firm and the lead bank. The first lending relationship variable (*Rel1*) is based on the loan amount. Specifically, it is calculated as the amount of loans by bank j to borrower i in the past five years divided by the total amount of loans by borrower i in the past five years. The second measure of lending relationship (*Rel2*) is the number of loans by bank j to borrower i in the past five years divided by the total number of loans by borrower i in the past five years. As reviewed in his survey paper, Boot (2000) concluded that relationships facilitate monitoring. Specifically, long-standing and strong relationship helps overcome the information asymmetries and agency problems that arise in lending arrangements. In the presence of these relationships, banks may therefore be more willing to incur the cost of gathering borrower-specific information, which can be applied to multiple transactions throughout a long-lasting relationship. Therefore, the bank's lending relationship with the borrowing firm can signal to the market participants the lead arranger's ability, experience, cost advantage, and willingness in monitoring the borrower (Lin et al., 2012). We therefore expect that the spillover effect would be more profound if the defaulting borrower had a strong and/or long-standing relationship with its lead lender.

While the above variables are all based on the defaulted loans, we also construct a similar list of measures based on the loans to the affected firms. In this case, for instance, *Ratio* captures the importance of the affected loans to the lead arrangers. It is calculated as the total affected loan amount lent by the syndicates with lead arranger j and outstanding to firm k (affected firm) upon the announcement of the bankruptcy of firm i (defaulted firm) divided by the average outstanding loan amount syndicated by lead bank j over the past two years. The variable is expressed in percentage. We construct the other variables (e.g. *Covenant*, *Recent Loan*, *Rel1*, *Rel2*) based on the loans to the affected firms accordingly. A full list and corresponding definitions of all of the key variables is summarized in Table 1.

2.4 Summary Statistics

In table 2, the total number of defaulted and affected loans for each year of the sample period is reported. Over the nine-year period (2002-2010), our sample includes 232 defaulted loans from 179 separate borrowers. From this list of defaulted loans, there were 2507 affected loans to 1696 companies. Throughout the sample period, there was a general upward trend in the number of defaulted and affected loans. The number of defaults fell somewhat in the 2006-2007 period and then once again increased during and after the financial crisis.

Table 3 provides some key summary statistics regarding the defaulted and affected loans, the characteristics of the defaulted and affected firms, and the bonds of the affected firms. The average defaulted loan was made about four years prior to the default and had a remaining maturity of 5.65 years. The average size was just over $1 billion and the average loan included 3.03 covenants. The affected loans were larger in size (the average size was $3.030 billion) and included fewer covenants (the average was 1.95) compared to the sample of defaulted loans. The age and maturity of the affected loans was also somewhat lower.

We also see some differences in the firm characteristics of the defaulted and affected firms. Most notably, the affected firms are larger, more profitable (as measured by ROA) and they have a higher average Tobin's Q. The affected firms are also followed by more analysts, and they have more institutional investors – which is expected given their larger size. On balance, these results suggest that the affected firms are generally large and healthy firms with significant analyst coverage. Arguably, building upon Diamond's (1991) reputation arguments, one might expect that a decline in the perceived monitoring effectiveness of their lead bank would have less of an adverse impact on these firms. The fact that we find otherwise in our subsequent empirical analysis emphasizes the importance of cross-monitoring effects.

Finally, Table 3 also reports some key summary statistics related to the affected firms' bonds. These bonds had an average rating of 7.60 (between A- and BBB+) with an average maturity just under 9 years. Moreover, on average they were issued 3.41 years before the event date with an annual coupon of 5.75%.

Table 4 summarizes the average abnormal returns of the affected bonds over the 11-day period surrounding the event date where its lead lender was involved in a default event. Both the mean and median abnormal returns are negative for 10 of the 11 days in the event window. The negative abnormal returns are particularly large over the event period (-1,4). The mean returns were -0.07% the day before the event, -0.17% the day of the event and peaked at -0.21% three days after the event. The average cumulative abnormal returns of the affected bonds over the eleven-day period surrounding the loan default are about -1%. The magnitude is not trivial given the fact that the average monthly excess return for corporate bonds (adjusted by monthly T-bill rate) is about 0.161 and the average monthly raw return for corporate bonds is about 0.61% (e.g. Lin et al., 2011; Jostova et al., 2013). These patterns are further illustrated in Figure 1, where we plot the cumulative abnormal returns around the loan default dates for the affected bonds in our sample.

3. Empirical Findings

3.1 Baseline Estimates

Our empirical tests focus on the spillover/contagion effects of loan defaults – specifically on how they influence the bond returns of other "affected firms" that have the same lead lender. In our analysis, we estimate the following baseline model:

$$CAR(-5,+5) = \beta_0 + \sum_i \beta_i Bond_i + \sum_j \beta_j Loan_j + \sum_k \beta_k Firm_k + \varepsilon \,, \qquad (2)$$

where CAR(-5,+5) is the cumulative abnormal return of the affected bonds in the eleven-day period around the loan default, and it is computed as the affected firm's selected bond's cumulative total return minus the cumulative return of the matching portfolio over the same period. $Bond_i$ is a series of selected bond characteristics; $Loan_j$ is a series of variables related to characteristics of the defaulted loans; $Firm_k$ is a series of variables related to the characteristics of the defaulted firms' in the fiscal year prior to when the defaulted loan was initiated. The key test is whether the cumulative abnormal returns are significantly less than zero (after controlling for a wide range of bond, loan and firm characteristics ($\beta_0 < 0$). We are also particularly interested in whether the strength and duration of the banking relationship of the defaulted firm significantly influences the bond market response of the affected firms. Our contention is that we would expect larger negative abnormal returns in those instances where the defaulting firm had a strong and/or long-lasting relationship with its lender. Arguably, these are the cases where the reputation of the lender is most damaged, and where we would expect to see the strongest cross-monitoring effects.

Table 5 presents the results from various versions of this baseline model. In each case, we control for the characteristics of the affected bonds. We also show the impact of including various measures of the relationship between the lead bank and the defaulting firm. In the last two models, we also simultaneously include various relationship measures along with the characteristics of the defaulting firm.

First, we see that in each of the first ten models presented in Table 5 the intercept term is negative and statistically different from zero. These results are economically significant – the estimated coefficients range from -1.46% in Model 9 to -2.40% in Model 7. These findings confirm that declines in the perceived monitoring ability of key lenders have important spillover effects in the public bond market. As can be seen in column (2), the coefficient of *Ratio* is negative and statistically significant at the 1% level, suggesting that the bond market responds more negatively when a default loan is an important deal to the lead arranger. Specifically, a one standard deviation increase in deal importance (*Ratio*) is associated with a 0.24% more negative bond cumulative abnormal returns (CARs) for the publicly traded firms that had loans made by the same lead lender at the same time as the defaulting firm. This result remains statistically significant after controlling for other determinants (columns 11 and 12) though the magnitude of the coefficients becomes smaller. In column (3), the coefficient of Covenant is positive and statistically significant at the 1% level. Higher covenant intensity might indicate that lenders perceived higher credit risks at the loan issuance date. Therefore, the default of firms with higher covenant intensity might be less of a surprise to bond market investors. As a consequence, the bond market responds less negatively when a defaulted loan has higher covenant intensity. A one standard deviation in loan covenant intensity is associated with a 0.15% increase in bond CARs of publicly traded firms that had at the same time loans made by the same lead lender as the defaulting firm. This result remains statistically significant at the 5% level after controlling for other determinants (columns 11 and 12). In column (4), we find that the coefficient corresponding to whether the loan was recently issued (Recent Loan) is negative and statistically significant (albeit at the 10% level). Moreover, after controlling for other determinants (columns 11 and 12), these effects become even stronger. As pointed out in the literature (e.g. Udell, 1989), banks monitor the continuing quality and performance of their loan portfolio through the loan review function. The deterioration of the historical performance of the loan portfolio might lead bank managers to hire more capable loan officers, update the lending policies and procedures, and adopt new technologies and credit scoring systems. Therefore, the default of a legacy loan might not reflect the bank's current screening and monitoring ability. Consequently, the performance of recently originated loans is likely to be more informative about the effectiveness of the bank's credit scoring system, current lending policies and monitoring ability compared to legacy loans. It is thus expected that the default of a recently originated loan would result in a larger impact on the bond market. As can be seen from columns (4), (11) and (12), the empirical results are consistent with our expectation. Using the estimate in column

(11) as an example, a default of a recently originated loan is associated with 0.47% more negative cumulative abnormal bond returns of publicly traded firms that had at the same time loans made by the same lead lender as the defaulting firm.

In columns (5) and (6), we explore the effect that a bank relationship has on the bond market response. As summarized by Boot (2000), a close lending relationship helps overcome the information asymmetry between the borrower and the lender and provides banks with more incentives to incur monitoring costs, since the information gathered can be applied to multiple transactions in a long-lasting relationship. Therefore, the presence of relationship lending can signal to the market the lead arranger's ability, experience, cost advantage, and willingness to monitor the borrower (Lin et al., 2012). Therefore, the default of a loan where there was a strong relationship, might be more likely to surprise the bond market investors of the firms that had at the same time loans made by the same lead lender as the defaulting firm. Following the literature (e.g. Lin et al., 2012), we use two alternative measures of lending relationship. To construct the first measure (Rel_1), for each loan, we calculate the total amount of loans made by its lead arranger to the borrower during the previous five years, scaled by the total amount of loans made to the borrower by all banks during the previous five years. To construct the second measure (Rel_2), we count the total number of loans made by its lead arranger to the borrower during the previous five years, scaled by the total number of loans the borrower received from all banks during the previous five years. Higher value of these measures indicates a closer lending relationship. Consistent with our expectation, we see in columns (5) and (6) that the bond market responds most negatively when a loan default occurs when the firm and its lender have a strong prior relationship. The results become statistically even more significant after controlling for other determinants (columns 11 and 12). Based on the estimates in columns (11) and (12), a one standard deviation increase in lending relationship is associated with 0.1% to 0.13% more negative cumulative abnormal bond returns of publicly traded firms that had at the same time loans made by the same lead lender as the defaulting firm.

In columns (7) to (10), we explore the impact that various characteristics of the defaulted have on the public bond market reactions. As can be seen from the table, the public bond market reactions are negatively associated with the defaulted firm's ROA in the loan origination year. Intuitively, the default of a financially healthy firm during the loan origination year delivers a more negative signal about the bank's monitoring ability to the market, which translates into a more negative cumulative abnormal bond return for the affected firms that had the same lead lender as the defaulting firm. This result remains statistically significant at the 1% level after controlling for other determinants (columns 11 and 12). Using the estimate in column (11) as an illustration, a defaulting firm with one standard deviation higher ROA in the loan initiation year is associated with 0.51% more negative cumulative abnormal bond returns for the affected firms that had the same lead lender as the defaulting firm. In the same spirit, the default of a firm with higher value of Tobin's Q in the loan initiation year sends a more negative signal about the bank's monitoring ability to the market. The negative and statistically significant (at 1% level) coefficient of Q confirms this expectation. This result remains statistically significant at the 1% level after controlling for other determinants (columns 11 and 12). Using column (11) for illustration, a defaulting firm with a one standard deviation higher level of Q at the loan initiation date is associated with 0.16% more negative cumulative abnormal bond returns for the affected firms that had the same lead lender as the defaulting firm. In addition, we find firm size at loan initiation date is positively associated with bond CARs. As documented in the literature (e.g. Lin et al., 2011), large firms tend to exhibit lower level of information opacity. Therefore, the default of a large firm might be less of a surprise to the market (as the market has paid continuous attention to such firms). We also expect that the default of a good governance firm (as proxied by the number of institutional investors) delivers a more negative signal to the bond market about the bank's monitoring ability. The negative and statistically significant (at the 1% level) coefficient of NII across models specifications (columns 10 to 12) confirms this expectation. Specifically, a one standard deviation increase in NII at the loan initiation date is associated with 0.60% more negative bond CARs for the affected firms that had the same lead lender as the defaulting firm (column 11).

Turning our attention to the last two columns of Table 5, we see that most findings remain significant when we employ the full model. We continue to find that the negative bond market reactions are particularly strong if the defaulting loan is an important deal to the lender, if it is a recently originated loan, if it comes from a relationship borrower and if the borrower has higher profitability, better governance and higher firm value at the loan issuance date.

Taken together, these baseline findings provide strong support for our main arguments and suggest that loan defaults have important spillover effects in the public bond market. Next, we consider a series of three robustness tests. We will see that in each case, the spirit of the main results holds.

3.2 Using the Characteristics of the Affected Firms Instead of the Defaulted Firms

In our baseline estimates, we controlled for the characteristics of the defaulted firms and explored how the abnormal returns were influenced by the strength of the relationship between the lead bank and the defaulted firms. While these measures are most directly relevant for testing cross-monitoring effects, it is also interesting to separately consider how the abnormal returns are influenced by the characteristics of the affected firms.

These estimates are reported in Table 6. Once again, the basic set-up is similar to that of Table 5, except we now use variables related to the affected firm instead of the defaulted firm. In each of the thirteen models, we find that the estimated coefficient on the intercept term consistently shows that bondholders realize significantly negative abnormal returns surrounding the loan default event. These results generally confirm the findings of Table 5. These results are economically significant – the estimated coefficients range from -1.93% in Model 1 to -2.59% in Model 12. These findings confirm that declines in the perceived monitoring ability of key lenders have important spillover effects in the public bond market. It is notable, however, that the relationship variables are now less likely to influence the abnormal returns. And while the Ratio measure is negative and statistically significant (at the 10% level in Model 2, and the 5% level in Models 12 and 13), the estimated coefficients are smaller than those reported in Table 5. Specifically, a one standard deviation increase in deal importance is associated with a 0.087% more negative bond CARs of the affected firms. Moreover, we find that the affected firms with higher profitability and higher firm value were less influenced by defaulted loans made by their key lender. Intuitively, bond investors of firms with higher profitability are less reliant on bank monitoring and are therefore are less affected by these default events. For instance, am affected firm with one standard deviation higher Q is associated with 0.098% less negative cumulative abnormal bond returns. We also find that affected firms with higher information opacity (proxied by lower analyst coverage) are more influenced by defaulted loans made by their key lender (column 8). The results remain robust after controlling for other firm and deal characteristics (columns 12).

Taken together, the collective findings in Tables 5 and 6 suggest that the cross-monitoring effects are most important if the lead bank had a strong relationship with the defaulting firm. And the variations of the bond CARs are mainly explained by the variations of the defaulting firm characteristics. In many respects, this confirms that the bank's reputation is particularly tainted if a key customer defaults. At the same time, while not as strong, these effects are also moderated by the affected firms' characteristics.

3.3 A Closer Look at Sub-samples Divided According to Analyst Coverage

In this section, we divide the sample into more transparent and less transparent firms based on the information opacity (proxied by analyst coverage) of the affected firms. As documented in the recent literature (e.g. Chen, Harford, and Lin, 2014), financial analysts play an important role in information production, which will discipline the corporate activities and decisions. We therefore explore whether the spillover effect mainly concentrates on those firms with lower analyst coverage (i.e. higher level of information opacity). The empirical results for the sub-sample of firms with low and high analyst coverage are reported respectively in Panels A and B of Table 7. Looking at the firms with low analyst coverage in Table 7A, we see that the empirical findings are highly robust to our main findings. We continue to find that the spillover effect is more profound if the defaulting firm had a strong and/or long-standing relationship with its lead lender. We also find that the negative bond market effect is particularly strong if the defaulting loan is an important deal to the lender, if it is a recently originated loan, and if the borrower has higher profitability and higher firm value at loan issuance date. As can be seen in columns (11) and (12), all the key variables (i.e. Ratio, Recent Loan, Covenant, Rel1, Rel2, Asset, ROA, Q, NII) enter the models significantly and bear the signs consistent with the full sample results presented in table 5.

Looking at the intercept terms in Table 7B, we see that many of the loan/firm characteristics of the defaulted firms became insignificant, suggesting that the information opacity of the affected firms plays an important moderating role. For these firms, we find that the negative bond market effect is particularly strong if the defaulting loan is a recently originated loan, and if the borrower has higher profitability and better governance at loan issuance date. We also find that there is a more profound bond market reaction if the lead bank had a strong relationship with the defaulting firm (column 12). Once again, however, the overall results display a much less significant pattern than those reported for the subsample in Table 7A. These results strongly confirm our conjecture that our main findings our more heavily driven by the affected firms with lower analyst coverage and a higher degree of information opacity.

3.4 Excluding Affected Firms that are in the Same Industry as the Defaulted Firm

Another concern is that in addition to cross-monitoring influences, the observed bond market effects may be a result of industry spillover effects (Lang and Stulz, 1992). To alleviate this concern, we further test the robustness of the results by excluding affected firms that are in the same industry as the defaulted firm. The empirical results are presented in Table 8. As can be seen from the table, our main results remain very robust. We continue to find that the negative bond market reactions are particularly strong if the defaulting loan is an important deal to the lender, if it is a recently originated loan, if it comes from a relationship borrower and if the borrower has higher profitability, firm value and better governance on the loan issuance date. In contrast, the negative bond market effect is weakened if the borrowers have larger size and lower information opacity. The empirical results related to the affected firm characteristics also remain largely robust. Taken together, these findings confirm that the industry spillover is not a main driving force of our findings.

4. Conclusion

In this paper, we examine the existence of a cross-monitoring effect between bank debt and public debt by exploring the effects that loan defaults have on the lead arranger's perceived reputation in the public debt markets. Generating a sample of major loan defaults among U.S. firms between 2002 and 2010, we empirically test the effects that these loans had on the bond returns of publicly traded firms that had at the same time loans made by the same lead lender as the defaulting firm. We show that the abnormal returns of these "affected" firms are negative and statistically significant. Moreover, these abnormal returns are economically significant – with a mean about -1% when measured over an eleven day window surrounding the announcement of the defaulting loan. In addition, we find that the negative bond market reactions are particularly strong if the defaulted loan is an important deal to the lender, if it is a recently originated loan, if it comes from a relationship borrower and if the borrower has higher profitability, higher firm value and better governance at loan issuance date. These results confirm that lenders suffer a loss to their reputations when their borrowers default, and these effects are particularly pronounced in those cases where they presumably had strong incentives or they should have done a better job to monitor the defaulting firm.

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Table 1. Key Variables Used in Our Empirical Analysis

Variable	Definitions
	Defaulted Loan Data
Amount	Defaulted loan size, in million dollars. The aggregate loan outstanding to bankrupt borrowers for each lead bank for each year.
Covenant	The number of covenants included in the defaulted loan. The covenant type includes Max. Capex, Max. Debt to EBITDA, Max. Debt to Equity, Max. Debt to Tangible Net Worth, Max. Leverage ratio, Max. Loan to Value, Max. Net Debt to Assets, Max. Senior Debt to EBITDA, Max. Senior Leverage, Max. Total Debt (including Contingent Liabilities) to Tangible Net Worth, Min. Cash Interest Coverage, Min. Current Ratio, Min. Debt Service Coverage, Min. EBITDA, Min. Equity to Asset Ratio, Min. Fixed Charge Coverage, Min. Interest Coverage, Min. Net Worth to Total Asset, Min. Quick Ratio and Other Ratio
Age	The loan age, it is calculated as how long (in years) the loan was outstanding on the market before it defaults.
Maturity	The original maturity (in years) of the loan when it was initiated
Ratio	The importance of the defaulted loan to the lead bank. It is calculated as the total defaulted loan amount lent by the syndicates with lead arranger j and outstanding to firm i at the bankruptcy year divided by the average outstanding loan amount syndicated by lead bank j over the past two years. The variable is expressed in percentage.
Rel1	Relationship strength between the defaulted firm and the lead bank. It is calculated as the amount of loans by bank j to borrower i in the past five years divided by the total amount of loans by the borrower in the past five years.
Rel2	Relationship strength between the defaulted firm and the lead bank. It is calculated as the number of loans by bank j to borrower i in the past five years divided by the total number of loans by the borrower in the past five years.
	Affected Loan Data
Amount	Affected loan size, in million dollars. The aggregate loan outstanding to affected borrowers for each lead bank for each year.
Covenant	The number of covenants included in the affected loan. The covenant type includes Max.

	Capex, Max. Debt to EBITDA, Max. Debt to Equity, Max. Debt to Tangible Net Worth, Max. Leverage ratio, Max. Loan to Value, Max. Net Debt to Assets, Max. Senior Debt to EBITDA, Max. Senior Leverage, Max. Total Debt (including Contingent Liabilities) to Tangible Net Worth, Min. Cash Interest Coverage, Min. Current Ratio, Min. Debt Service Coverage, Min. EBITDA, Min. Equity to Asset Ratio, Min. Fixed Charge Coverage, Min. Interest Coverage, Min. Net Worth to Total Asset, Min. Quick Ratio and Other Ratio
Age	The loan age, it is calculated as how long (in years) the loan was outstanding on the market before the default event.
Maturity	The original maturity (in years) of the loan when it was initiated
Ratio	The importance of the affected loan to the lead bank. It is calculated as the total affected loan amount lent by the syndicates with lead arranger j and outstanding to firm k (affected firm) upon the announcement of the bankruptcy of firm I (defaulted firm) divided by the average outstanding loan amount syndicated by lead bank j over the past two years. The variable is expressed in percentage.
Rel1	Relationship strength between the affected firm and the lead bank. It is calculated as the amount of loans by bank j to borrower i in the past five years divided by the total amount of loans by the borrower in the past five years.
Rel2	Relationship strength between the affected firm and the lead bank. It is calculated as the number of loans by bank j to borrower i in the past five years divided by the total number of loans by the borrower in the past five years.
	Defaulted Firm Characteristics
Asset	The natural log of total asset measured in millions of US dollars of the defaulted firm at prior fiscal year end when the defaulted loan was initiated.
ROA	Return on Asset of the defaulted firm at prior fiscal year end when the defaulted loan was initiated. It is calculated as net income over total assets.
TQ	Tobin's Q of the defaulted firm at prior fiscal year end when the defaulted loan was initiated. Tobin's Q is calculated as market value of equity plus total assets minus book value of equity divided by total assets. Market value of equity is price per share times total number of shares outstanding.
NII	The natural log of number of institutional investors at prior fiscal year end when the defaulted loan was initiated.

	Affected Firm Characteristics
Asset	The natural log of total asset measured in millions of US dollars of the affected firm at prior fiscal year end of default event.
ROA	Return on Asset of the affected firm at prior fiscal year end of default event. It is calculated as net income over total assets.
TQ	Tobin's Q of the affected firm at prior fiscal year end of default event. Tobin's Q is calculated as market value of equity plus total assets minus book value of equity divided by total assets. Market value of equity is price per share times total number of shares outstanding.
NA	Number of analysis at prior fiscal year end of default event.
NII	The natural log of number of institutional investors at prior fiscal year end of default event.
	Bond Characteristics
Rate	Ratings represent Moody ratings, converted to integer values ranging from 0 for Aaa ratings to 21 for D ratings
BAge	Age of the bond (in years).
Maturity	Time to maturity of the bond (in years).
Coupon	Coupon rate of the bond.

Table 2. Summary Statistics on Loan Bankruptcy Filings by Year

This table summarizes the defaulted loan number, defaulted firm number, and affected firm information of the corporate bond data used in empirical analysis for the sample period from 2002 to 2010. Defaulted firms are companies that file for bankruptcy during the sample period. Affected firms are companies that have outstanding loans with the same lead lender as the defaulting firms. Defaulted loans are loans to defaulted firms that are outstanding at the time of the company's bankruptcy filing. Affected loans are loans to affected firms that are outstanding at the time of the bankruptcy filing and made by the same lead lender of the defaulted loans.

Year	Defaulted loan number	Defaulted firm number	Affected Facility number	Affected loan number	Affected firm number
2002	8	8	32	32	32
2003	30	24	184	180	126
2004	22	19	204	198	126
2005	23	12	348	344	226
2006	17	12	356	353	220
2007	14	13	183	182	141
2008	37	26	342	338	217
2009	54	42	428	426	287
2010	27	23	457	454	321
2002-2010	232	179	2534	2507	1696

Table 3. Summary Statistics, Key Variables

This table reports the summary statistics of the variables related to defaulted (affected) loans, defaulted (affected) firm characteristics, and selected bond characteristics. All the variables are defined as Table 1. Defaulted firms are companies that file for bankruptcy during the sample period. Affected firms are companies that have outstanding loans with the same lead lender as the defaulting firms. Defaulted loans are loans to defaulted firms that are outstanding at the time of the company's bankruptcy filing. Affected loans are loans to affected firms that are outstanding at the time of the bankruptcy filing and made by the same lead lender of the defaulted loans. Selected bonds are the most frequently traded corporate bonds of the affected firms.

	Mean	Std. Dev.	25^{th}	Median	75^{th}
			Defaulted Loan Characteristics		
Amount	1067.29	1183.96	192.00	575.00	1636.92
Covenant	3.03	3.01	0.00	2.00	6.00
Age	3.97	2.01	2.11	4.02	5.60
Maturity	5.65	1.80	5.00	5.00	6.50
Ratio (%)	0.13	0.26	0.03	0.05	0.10
Rel1	0.47	0.44	0.22	0.43	0.66
Rel2	0.46	0.43	0.17	0.37	0.60
			Affected Loan Characteristics		
Amount	3029.87	3798.35	900.00	1800.00	3600.00
Covenant	1.95	2.15	0.00	2.00	3.00
Age	3.31	1.94	1.99	3.45	4.37
Maturity	4.97	2.51	5.00	5.00	5.00
Ratio (%)	0.33	0.67	0.11	0.15	0.32
Rel1	0.50	0.43	0.25	0.49	0.78
Rel2	0.47	0.41	0.25	0.50	0.67
			Defaulted Firms' characteristics		
Asset	7.34	1.42	6.44	7.28	8.10
ROA	-0.09	0.28	-0.10	-0.01	0.04
TQ	1.34	0.35	1.17	1.26	1.52
NA	8.97	5.61	3.25	9.30	12.33
NII	4.46	0.76	3.69	4.70	4.88
			Affected Firms' Characteristics		
Asset	10.03	1.43	9.05	10.02	10.78
ROA	0.03	0.17	0.01	0.04	0.07
TQ	1.58	0.68	1.11	1.38	1.83
NA	16.67	7.15	12.00	16.33	21.42
NII	6.12	0.75	5.71	6.13	6.66
			Selected Bonds' characteristics		
Rate	7.60	3.76	5.00	7.00	10.00
BAge	3.41	2.52	1.57	2.85	4.58
Maturity	8.97	9.10	3.78	6.00	9.06
Coupon	5.75	1.93	4.80	5.89	6.88

Table 4. Abnormal Return around the Default Event

This table reports the summary statistics of daily abnormal return (in percentage) around loan default. The abnormal return is calculated as the selected bond raw return in excess of the matching portfolio's average return on the same day. Matching portfolios are constructed using a two-way sorting procedure involving four rating groups AAA/AA, A, BBB, and below BBB and three time-to-maturity groups. Since bonds are not frequently traded, the sample size for different days can be different.

Day	Mean	Median	Min	Max	Std.	No.
-5	-0.08	-0.06	-5.88	5.68	1.74	1775
-4	-0.17	-0.12	-3.48	3.72	1.65	1015
-3	-0.03	0.01	-3.53	3.08	1.68	325
-2	0.02	-0.02	-3.16	3.51	1.03	1196
-1	-0.07	-0.04	-6.63	4.53	1.37	1519
0	-0.17	-0.15	-6.48	6.34	1.72	1409
1	-0.09	-0.09	-5.82	6.27	1.80	1624
2	-0.10	-0.12	-4.21	5.63	1.64	1437
3	-0.21	-0.12	-5.50	3.29	1.70	417
4	-0.09	-0.08	-4.30	5.55	1.62	419
5	-0.02	-0.02	-3.36	2.62	0.96	1775

Table 5. Regression Analysis of Defaulted Firms

This table presents the regression results of the following equation: $CAR(\text{-}5,+5) = \beta_0 + \sum_i \beta_i Bond_i + \sum_j \beta_j Loan_j + \sum_k \beta_k Firm_k + \varepsilon$,where CAR(-5,+5) is the cumulative abnormal return in the eleven-day period around the loan default, and is computed as the affected firm's selected bond's cumulative total return minus the cumulative return of the matching portfolio over the same period. *Bond*$_i$ is the selected bond characteristics; *Loan*$_j$ is the variables related to defaulted loans; *Firm*$_k$ is the defaulted firms' characteristics at the prior fiscal year when the defaulted loan was initiated. The dependent variable is the affected firm's 11-day bond CAR (-5, +5). *Coupon, Bage, Maturity* and *Rate* are coupon rate, bond age, bond time to maturity and ratings of the bonds for the affected firms, respectively. *Ratio* is a continuous variable that identifies the importance of the defaulted loan to the lead lender. It is calculated as the total defaulted loan amount lent by lead bank j to firm i during year t divided by the average annual amount outstanding for lead bank j over the past two years (lending size). *Covenant* is the number of covenants included in the defaulted loan and *Recent Loan* is the dummy variable which equals 1 if the loan defaulted loan is a recently originated loan. *Rel1* and *Rel2* are two relationship strength measures between the defaulted firm and the lead bank. Specifically, *Rel1* (*2*) is calculated as the amount (number) of loans by bank j to borrower i in the past five years divided by the total amount (number) of loans by the borrower in the past five years. *Asset, ROA, TQ* and *NII* are the firm characteristics of the defaulted firms, which are all calculated at prior fiscal year end when the defaulted loan was initiated. *Asset* is the natural log of the defaulted firm's total asset. *ROA* is Return on Asset of the defaulted firm and is calculated as net income over total assets. *TQ* is Tobin's Q of the defaulted firm, which is calculated as market value of equity plus total assets minus book value of equity divided by total assets. *NII* is the number of institutional investors of the defaulted firm. *Inte*. is the intercept term. Detailed variable definitions are given in Table 1. Heteroskedasticity-consistent t-statistics clustered at the firm level are reported in parentheses. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-1.93***	-1.99***	-2.02***	-1.83***	-1.76***	-1.74***	-2.40***	-1.89***	-1.46***	-1.54***	-0.81	-0.76
	-8.92	-8.85	-9.05	-8.23	-7.25	-7.18	-5.78	-8.14	-5.95	-3.17	-1.20	-1.12
Coupon	0.07**	0.09**	0.07*	0.08**	0.06	0.06	0.04	0.03	0.03	0.03	0.04	0.04
	1.99	2.37	1.89	2.12	1.47	1.47	1.06	0.91	0.60	0.64	0.89	0.88
Bage	0.05**	0.05**	0.05***	0.04**	0.06***	0.06***	0.05**	0.04**	0.04*	0.04	0.04	0.04
	2.34	2.26	2.45	2.24	2.58	2.61	2.29	2.21	1.86	1.39	1.23	1.26
Maturity	0.02***	0.02***	0.02***	0.02***	0.02**	0.02**	0.02***	0.02***	0.02***	0.02***	0.02**	0.02**
	2.83	2.81	2.91	2.75	2.40	2.40	3.72	3.46	3.61	2.94	2.30	2.28
Rate	0.06	0.07	0.06	0.05	0.04	0.04	0.07	0.07	0.07	0.03	-0.00	0.00
	0.92	1.05	1.01	0.72	0.55	0.57	1.02	1.11	0.87	0.38	-0.01	0.01
Ratio		-0.93***									-0.58**	-0.58*
		-3.33									-1.87	-1.85
Covenant			0.05***								0.05*	0.06**
			2.47								1.94	2.10
Recent Loan				-0.17*							-0.51***	-0.51***
				-1.65							-3.16	-3.17
Rel1					-0.24*						-0.35*	
					-1.72						-1.71	
Rel2						-0.30**						-0.45**
						-2.11						-2.13
Asset							0.38*				0.42***	0.39***
							1.86				3.58	3.28
ROA								-1.02***			-1.16***	-1.16***
								-4.95			-4.14	-4.14
TQ									-0.51***		-0.47**	-0.47**
									-3.79		-2.36	-2.38
NII										-0.21***	-0.79***	-0.75***
										-0.27	-3.93	-3.70
N	1784	1718	1784	1784	1596	1596	1544	1544	1257	1212	1009	1009
Adj-R^2	1.22	1.58	1.41	1.36	1.19	1.30	1.44	2.80	1.93	1.78	7.86	8.02

Table 6. Regression Analysis of Affected Firms

This table presents the regression results of the following equation: $CAR(\text{-}5,+5) = \beta_0 + \sum_i \beta_i Bond_i + \sum_j \beta_j Loan_j + \sum_k \beta_k Firm_k + \varepsilon$,where CAR(-5,+5) is the cumulative abnormal return in the eleven-day period around the loan default, and is computed as the affected firm's selected bond's cumulative total return minus the cumulative return of the matching portfolio over the same period. *Bond*$_i$ is the selected bond characteristics; *Loan*$_j$ is the variables related to affected loans; *Firm*$_k$ is the affectted firms' characteristics at the prior fiscal year when the loan default. The dependent variable is the affected firm's 11-day bond CAR (-5, +5). *Coupon, Bage, Maturity* and *Rate* are coupon rate, bond age, time to maturity and ratings of the bonds for the affected firms, respectively. *Ratio* is a continuous variable that identifies the importance of the affected loan to the lead lender. It is calculated as the total affected loan amount lent by lead bank j to firm i during year t divided by the average annual amount outstanding for lead bank j over the past two years (lending size). *Covenant* is the number of covenants included in the affected loan and *Recent Loan* is a dummy variable which equals 1 if affected loan is a recently originated loan. *Rel1* and *Rel2* are two relationship strength measures between the affected firm and the lead bank. Specifically, *Rel1* (*2*) is calculated as the amount (number) of loans by bank j to borrower i in the past five years divided by the total amount (number) of loans by the borrower in the past five years. *Asset*, *NA*, *ROA*, *TQ* and *NII* are the firm characteristics of the affected firms, which are all calculated at prior fiscal year end of default event. *Asset* is the natural log of the affected firm's total asset. *NA* is the number of analyst of the affected firm. *ROA* is Return on Asset of the affected firm and is calculated as net income over total assets. *TQ* is Tobin's Q of the affected firm, which is calculated as market value of equity plus total assets minus book value of equity divided by total assets. *NII* is the number of institutional investors of the affected firm. *Inte*. is the intercept term. Detailed variable definitions are given in Table 1. Heteroskedasticity-consistent t-statistics clustered at the firm level are reported in parentheses. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Intercept	-1.93***	-1.96***	-1.91***	-1.95***	-1.98***	-1.98***	-1.94***	-2.35***	-1.97***	-2.25***	-2.27***	-2.59***	-2.59***
	-8.92	-8.66	-8.80	-8.86	-8.29	-8.31	-8.67	-8.02	-9.02	-8.55	-3.55	-3.20	-3.16
Coupon	0.07**	0.09**	0.07**	0.07**	0.10***	0.10***	0.07**	0.08**	0.08**	0.09**	0.07**	0.11***	0.11***
	1.99	2.35	1.98	1.98	2.49	2.50	2.04	2.15	2.15	2.42	2.03	2.79	2.79
Bage	0.05**	0.04**	0.05***	0.05**	0.04**	0.04**	0.04**	0.05**	0.05**	0.05**	0.04**	0.05**	0.05**
	2.34	2.16	2.49	2.34	2.06	2.04	2.24	2.34	2.28	2.47	2.24	2.25	2.26
Maturity	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	2.83	2.72	2.86	2.83	2.64	2.64	2.75	2.84	2.74	2.88	2.77	2.58	2.58
Rate	0.06	0.07	0.03	0.06	0.02	0.02	0.05	0.09	0.06	0.07	0.07	0.06	0.06
	0.92	1.04	0.42	0.95	0.35	0.35	0.72	1.31	0.85	1.05	0.95	0.69	0.68
Ratio		-0.13*										-0.13**	-0.13**
		-1.91										-2.30	-2.30
Covenant			0.06									0.07	0.07
			1.22									1.45	1.45
Recent Loan				0.04								0.07	0.07
				0.36								0.59	0.58
Rel1					0.04							-0.05	
					0.37							-0.39	
Rel2						0.05							-0.05
						0.38							-0.40
Asset							0.07					0.06	0.06
							0.03					0.71	0.70
NA								0.02***				0.02*	0.02*
								2.49				1.67	1.67
ROA									0.40			0.18	0.18
									1.07			0.44	0.44
TQ										0.19**		0.19**	0.19**
										2.38		2.37	2.37
NII											-0.05	-0.09	-0.09
											-0.60	-0.53	-0.53
N	1784	1718	1784	1784	1663	1663	1764	1752	1764	1762	1762	1581	1581
Adj-R^2	1.22	1.65	1.32	1.23	1.29	1.29	1.19	1.45	1.28	1.45	1.19	2.18	2.18

Table 7. Information Asymmetry and Bond Market Reaction

This table presents the regression results of the following equation: $CAR(\text{-}5,+5) = \beta_0 + \sum_i \beta_i Bond_i + \sum_j \beta_j Loan_j + \sum_k \beta_k Firm_k + \varepsilon$,where CAR(-5,+5) is the cumulative abnormal return in the eleven-day period around the loan default, and is computed as the affected firm's selected bond's cumulative total return minus the cumulative return of the matching portfolio over the same period. $Bond_i$ is the selected bond characteristics; $Loan_j$ is the variables related to defaulted loans; $Firm_k$ is the defaulted firms' characteristics at the prior fiscal year when the defaulted loan was initiated. We split the sample into two subsamples based on the median value of *NA* of affected firms. The dependent variable is the affected firm's 11-day bond CAR (-5, +5). *Coupon*, *Bage*, *Maturity* and *Rate* are coupon rate, bond age, time to maturity and ratings of the bonds for the affected firms, respectively. *Ratio* is a continuous variable that identifies the importance of the defaulted loan to the lead lender. It is calculated as the total defaulted loan amount lent by lead bank j to firm i during year t divided by the average annual amount outstanding for lead bank j over the past two years (lending size). *Covenant* is the number of covenants included in the defaulted loan and *Recent Loan* is a dummy variable which equals 1 if the defaulted loan is a recently originated loan. *Rel1* and *Rel2* are two relationship strength measures between the defaulted firm and the lead bank. Specifically, *Rel1* (*2*) is calculated as the amount (number) of loans by bank j to borrower i in the past five years divided by the total amount (number) of loans by the borrower in the past five years. *Asset*, *ROA*, *TQ* and *NII* are the firm characteristics of the defaulted firms, which are all calculated at prior fiscal year end when the defaulted loan was initiated. *Asset* is the natural log of the defaulted firm's total asset. *ROA* is Return on Asset of the defaulted firm and is calculated as net income over total assets. *TQ* is Tobin's Q of the defaulted firm, which is calculated as market value of equity plus total assets minus book value of equity divided by total assets. *NII* is the number of institutional investors of the defaulted firm. Inte is the intercept term. Detailed variable definitions are given in Table 1. We split the sample into two subsamples based on the median value of analyst coverage of affected firms. Panel A presents the results of subsample with low (below-median) analyst coverage of affected firms, while Panel B reports the results of the subsample with high (above-median) analyst coverage of affected firms. Heteroskedasticity-consistent t-statistics clustered at the firm level are reported in parentheses. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Low Analyst Coverage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-2.37***	-2.43***	-2.49***	-2.29***	-2.22***	-2.22***	-2.36***	-2.11***	-1.49***	-1.61***	-0.56	-0.51
	-6.71	-6.63	-6.87	-6.35	-5.62	-5.63	-3.71	-6.87	-3.92	-2.31	-0.57	-0.52
Coupon	0.06	0.08*	0.06	0.07	0.06	0.06	0.01	-0.01	-0.03	-0.01	-0.02	-0.02
	1.25	1.53	1.11	1.28	1.05	1.05	0.11	-0.05	-0.61	-0.14	-0.29	-0.29
Bage	0.06**	0.07**	0.06**	0.06**	0.09***	0.09***	0.06**	0.06*	0.06	0.06	0.08*	0.08*
	2.04	1.99	2.09	2.02	2.70	2.70	1.96	1.93	1.64	1.69	1.79	1.80
Maturity	0.02***	0.03***	0.02***	0.02***	0.03***	0.03***	0.02**	0.02***	0.02**	0.02**	0.02*	0.02*
	2.80	3.01	2.83	2.78	2.54	2.53	2.28	2.15	2.03	1.96	1.77	1.76
Rate	0.14	0.15	0.15	0.13	0.12	0.12	0.16	0.16	0.17	0.11	0.11	0.11
	1.50	1.59	1.60	1.41	1.19	1.19	1.61	1.58	1.54	0.98	0.87	0.86
Ratio		-0.36***									-0.45**	-0.45**
		-3.18									-1.98	-1.97
Covenant			0.08***								0.05*	0.06*
			2.60								1.70	1.74
Recent Loan				-0.14							-0.76***	-0.76***
				-0.86							-3.04	-3.05
Rel1					-0.56***						-0.35**	
					-2.66						-2.06	
Rel2						-0.58***						-0.39**
						-2.74						-2.18
Asset							0.37***				0.43**	0.41**
							2.58				2.31	2.15
ROA								-1.06***			-1.33**	-1.33**
								-3.63			-3.27	-3.27
TQ									-0.70***		-0.95***	-0.95***
									-2.97		-2.72	-2.72
NII										-0.78***	-0.86***	-0.84***
										-2.60	-2.84	-2.72
N	895	854	895	895	803	803	780	780	637	610	504	504
Adj-R^2	1.62	2.20	1.92	1.70	2.66	2.72	1.36	2.84	2.49	1.98	10.80	10.86

Panel B: High Analyst Coverage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-1.82***	-1.90***	-1.87***	-1.70***	-1.75***	-1.71***	-1.77***	-1.97***	-1.74***	-1.91***	-1.34	-1.29
	-6.64	-6.67	-6.63	-5.92	-5.97	-5.82	-5.14	-6.57	-5.17	-2.73	-1.41	-1.35
Coupon	0.10**	0.11**	0.10**	0.11**	0.09*	0.09*	0.10*	0.09*	0.11*	0.10	0.13*	0.13*
	2.04	2.21	2.00	2.21	1.67	1.65	1.85	1.72	1.66	1.43	1.67	1.65
Bage	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.00	-0.02	-0.02
	1.09	0.96	1.17	0.92	0.74	0.75	1.05	0.89	0.64	0.08	-0.35	-0.33
Maturity	0.01	0.01	0.01	0.01	0.01	0.01	0.02***	0.02***	0.02***	0.02*	0.01	0.01
	1.38	1.26	1.42	1.28	1.04	1.02	2.89	2.62	2.54	1.94	1.26	1.23
Rate	0.05	0.05	0.05	0.03	0.04	0.04	0.05	0.07	0.06	0.07	0.03	0.03
	0.51	0.53	0.54	0.28	0.43	0.45	0.53	0.74	0.61	0.63	0.21	0.24
Ratio		0.07									-0.58	-0.58
		0.23									-1.41	-1.41
Covenant			0.03								0.03	0.04
			0.86								0.54	0.71
Recent				-0.21*							-0.35*	-0.35*
Loan				-1.66							-1.71	-1.69
Rel1					0.10						-0.33	
					0.57						-1.41	
Rel2						0.01						-0.46*
						0.06						-1.88
Asset							0.12**				0.33**	0.29**
							2.19				2.40	2.10
ROA								-0.96***			-0.96***	-0.96***
								-3.39			-2.60	-2.59
TQ									-0.30**		-0.16	-0.15
									-2.18		-1.01	-0.96
NII										-0.26**	-0.60**	-0.54**
										-2.10	-2.47	-2.21
N	889	864	889	889	793	793	764	764	620	602	505	505
Adj-R^2	1.45	1.69	1.53	1.69	1.05	1.01	2.63	3.63	2.54	1.80	6.50	6.76

Table 8. Regression Analysis Exclude the Industry Impact

This table presents the regression results of the following equation: $CAR(\text{-}5,+5) = \beta_0 + \sum_i \beta_i Bond_i + \sum_j \beta_j Loan_j + \sum_k \beta_k Firm_k + \varepsilon$,where CAR(-5,+5) is the cumulative abnormal return in the eleven-day period around the loan default, and is computed as the affected firm's selected bond's cumulative total return minus the cumulative return of the matching portfolio over the same period. *Bond$_i$* is the selected bond characteristics; *Loan$_j$* is the variables related to defaulted / affected loans; *Firm$_k$* is the defaulted / affected firms' characteristics. To control possible industry impact, we exclude the observations that the defaulted and affected firms are in the same industry. . The dependent variable is the affected firm's 11-day bond CAR (-5, +5). *Coupon*, *Bage*, *Maturity* and *Rate* are coupon rate, bond age, time to maturity and ratings of the bonds for the affected firms, respectively. In Panel A, loan and firm characteristics are based on defaulted side. *Ratio* is a continuous variable that identifies the importance of the defaulted loan to the lead lender. It is calculated as the total defaulted loan amount lent by lead bank j to firm i during year t divided by the average annual amount outstanding for lead bank j over the past two years (lending size). *Covenant* is the number of covenants included in the defaulted loan and *Recent Loan* is a dummy variable which equals 1 if the defaulted loan is a recently originated loan. *Rel1* and *Rel2* are two relationship strength measures between the defaulted firm and the lead bank. Specifically, *Rel1* (*2*) is calculated as the amount (number) of loans by bank j to borrower i in the past five years divided by the total amount (number) of loans by the borrower in the past five years. *Asset*, *ROA*, *TQ* and *NII* are the firm characteristics of the defaulted firms, which are all calculated at prior fiscal year end when the defaulted loan was initiated. *Asset* is the natural log of the defaulted firm's total asset. *ROA* is Return on Asset of the defaulted firm and is calculated as net income over total assets. *TQ* is Tobin's Q of the defaulted firm, which is calculated as market value of equity plus total assets minus book value of equity divided by total assets. *NII* is the number of institutional investors of the defaulted firm. In Panel B, loan and firm characteristics are based on affected side. *Ratio* is a continuous variable that identifies the importance of the affected loan to the lead lender. It is calculated as the total affected loan amount lent by lead bank j to firm i during year t divided by the average annual amount outstanding for lead bank j over the past two years (lending size). *Covenant* is the number of covenants included in the affected loan and *Recent Loan* is a dummy variable which equals 1 if the affected loan is a recently originated loan.. *Rel1* and *Rel2* are two relationship strength measures between the affected firm and the lead bank. Specifically, *Rel1* (*2*) is calculated as the amount (number) of loans by bank j to borrower i in the past five years divided by the total amount (number) of loans by the borrower in the past five years. *Asset*, *NA*, *ROA*, *TQ* and *NII* are the firm characteristics of the affected firms, which are all calculated at prior fiscal year end of default event. *Asset* is the natural log of the affected firm's total asset. *NA* is the number of analyst of the affected firm. *ROA* is Return on Asset of the affected firm and is calculated as net income over total assets. *TQ* is Tobin's Q of the affected firm, which is calculated as market value of equity plus total assets minus book value of equity divided by total assets. *NII* is the number of institutional investors of the affected firm. *Inte* is the intercept term. Detailed variable definitions are given in Table 1. Heteroskedasticity-consistent t-statistics clustered at the firm level are reported in parentheses. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Defaulted Side

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-1.88***	-1.95***	-1.97***	-1.77***	-1.74***	-1.72***	-2.37***	-1.85***	-1.37***	-1.52***	-0.69	-0.64
	-8.70	-8.61	-8.76	-7.95	-7.21	-7.14	-5.63	-7.93	-5.62	-3.05	-0.99	-0.92
Coupon	0.06*	0.08**	0.06*	0.07*	0.05	0.05	0.03	0.02	0.01	0.01	0.04	0.04
	1.76	2.15	1.68	1.90	1.33	1.33	0.77	0.65	0.31	0.30	0.73	0.72
Bage	0.05**	0.05**	0.05**	0.04**	0.06***	0.06***	0.05**	0.04**	0.04*	0.04	0.04	0.04**
	2.35	2.26	2.44	2.23	2.53	2.56	2.32	2.22	1.77	1.35	1.12	1.15
Maturity	0.02***	0.02***	0.02***	0.02***	0.01**	0.01**	0.02***	0.02***	0.02**	0.02***	0.02**	0.02**
	2.76	2.74	2.84	2.66	2.38	2.38	3.63	3.35	3.44	2.80	2.22	2.21
Rate	0.06	0.07	0.07	0.05	0.04	0.04	0.08	0.09	0.08	0.05	0.02	0.02
	0.99	1.11	1.06	0.75	0.56	0.58	1.14	1.24	1.09	0.58	0.24	0.26
Ratio		-0.84***									-0.53*	-0.53*
		-3.09									-1.71	-1.70
Covenant			0.05**								0.04*	0.05*
			2.16								1.70	1.86
Recent Loan				-0.20*							-0.57***	-0.56***
				-1.87							-3.24	-3.26
Rel1					-0.17						-0.29	
					-1.22						-1.38	
Rel2						-0.23*						-0.38*
						-1.72						-1.78
Asset							0.08*				0.36***	0.33***
							1.90				2.98	2.72
ROA								-1.05***			-1.15***	-1.15***
								-5.00			-4.11	-4.11
TQ									-0.56***		-0.67***	-0.66***
									-3.73		-2.81	-2.77
NII										-0.12**	-0.69***	-0.65***
										-2.14	-3.36	-3.16
N	1741	1677	1741	1741	1565	1565	1502	1502	1218	1174	985	985
Adj-R^2	1.15	1.48	1.31	1.34	1.04	1.12	1.40	2.81	1.95	1.69	7.53	7.67

Panel B: Affected Side

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Intercept	-1.88***	-1.92***	-1.87***	-1.90***	-1.94***	-1.94***	-1.83***	-2.28***	-1.94***	-2.26***	-2.29***	-2.64***	-2.63***
	-8.70	-8.39	-8.56	-8.67	-7.97	-7.98	-3.42	-7.64	-8.84	-8.52	-3.57	-3.22	-3.18
Coupon	0.06*	0.08**	0.06*	0.06*	0.09**	0.09**	0.07*	0.07**	0.07*	0.08**	0.07*	0.11***	0.11***
	1.76	2.12	1.76	1.75	2.31	2.31	1.86	1.92	1.93	2.29	1.82	2.69	2.69
Bage	0.05**	0.04**	0.05***	0.05**	0.04**	0.04**	0.04**	0.05**	0.04**	0.05**	0.04**	0.05**	0.05**
	2.35	2.16	2.48	2.35	2.18	2.17	2.16	2.25	2.20	2.42	2.15	2.24	2.25
Maturity	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	2.76	2.65	2.79	2.76	2.65	2.65	2.62	2.71	2.62	2.77	2.65	2.55	2.55
Rate	0.06	0.07	0.04	0.06	0.02	0.02	0.06	0.10	0.07	0.08	0.08	0.07	0.07
	0.99	1.10	0.57	1.00	0.30	0.37	0.82	1.43	1.04	1.27	1.17	0.82	0.81
Ratio		-0.13**										-0.14**	-0.14**
		-2.37										-2.35	-2.36
Covenant			0.05									0.06	0.06
			1.02									1.24	1.24
Recent Loan				0.02								0.06	0.06
				0.18								0.45	0.44
Rel1					0.02							-0.05	
					0.21							-0.37	
Rel2						0.02							-0.06
						0.30							-0.41
Asset							-0.01					0.06	0.06
							-0.14					0.76	0.75
NA								0.02***				0.01	0.01
								2.21				1.25	1.25
ROA									0.40			0.16	0.16
									1.07			0.39	0.39
TQ										0.22***		0.24*	0.24*
										2.71		1.74	1.76
NII											-0.06	-0.09*	-0.09
											-0.71	-0.50	-0.49
N	1741	1677	1741	1741	1625	1625	1729	1717	1729	1727	1727	1552	1552
Adj-R^2	1.15	1.57	1.21	1.15	1.24	1.24	1.12	1.34	1.21	1.48	1.13	2.11	2.11

Figure 1. Cumulative Abnormal Return around Loan Default

This figure shows the cumulative abnormal return around the loan default. The cumulative abnormal return is computed as the affected firm's selected bond's cumulative total return minus the cumulative return of the matching portfolio based on rating and time-to-maturity over the same period.