ESSAYS ON CORPORATE BORROWING

by

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ABSTRACT

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This dissertation comprises two essays on corporate borrowing. In the first essay, I study the relation between local bank competition and the cost of corporate borrowing. Using LPC DealScan data from 1995 to 2010, I find that loan spread, number of covenants and covenant strictness are negatively related to local bank competition. Firms with non-investment grade benefit more from bank competition than firms with investment grade. The results suggest that lenders from a competitive loan market give more favorable loans to borrowers.

In the second essay, I study creditor's control right and its impact on bond performance. By examining bond performance of nonfinancial firms with both bank loan and public bonds from 1996 through 2008, I find that bondholders react positively to loan covenant violation from long-term and short-term bond abnormal returns. I show that cross-section abnormal bond returns are positively related to bank's incentive to influence. I provide evidence of bank's influence over corporate governance, such as forced CEO turnover and bank directors on board. Finally, I find that cross-section abnormal stock return is positively related to bank's incentive to influence and conclude that bank influence creates value for both public bondholders and stockholders.

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Local Bank Competition and Cost of Corporate Borrowing

1.1 Introduction

Since capital markets are geographically segmented (Becker (2004), Cetorelli and Strahan (2006)) and bank's lending is local (Petersen and Rajan (2002)), corporate borrowing is affected by geographic financial conditions. Suppose two identical firms need capital to finance a project. One firm is located in a area with high local bank competition, the other one is located in a area with low local bank competition. Intuitively, the one locating in the area with high local bank competition is more likely to receive cheap loans, since local banks compete with each other to reduce cost of loans. This chapter intends to analyze the relation between local bank competition and cost of corporate borrowing, measured by loan spread and loan covenant strictness.

In a concentrated loan market, a bank can set both price and non-price terms less favorable to borrowers and raise profit via its monopoly power. While in a competitive loan market, a bank has to offer favorable loan terms by competition pressure from other competitors. Therefore, local bank competition reduces cost of corporate borrowing in local markets. Previous literature focuses on bank consolidation price effect on small business loan (Petersen and Rajan (1995), Scott and

Dunkelberg (2003), Degryse and Ongena (2005)), industrial and commercial loans (Erel (2011)) and consumer loans (Kahn et al. (2005)). There are three limitations on previous studies. First, most research focuses on event studies, such as bank consolidation in the 1990s. We don't know the general bank competition effects on cost of corporate borrowing. Second, there is no discussion of bank competition effect on non-price loan terms, such as loan covenant strictness. Loan covenant strictness is an implicit borrowing cost, since violating a covenant is costly for a borrower. When a firm violated a loan covenant, existing banks will involve with the violator to renegotiate on terms of existing loans and to influence financial and investment policies of borrowers in the future (Chava and Roberts (2008), Roberts and Sufi (2009), Nini et al. (2011)). However, little is know in empirical studies about bank competition effect on non-price terms. This chapter would like to investigate the effect of bank competition on both price and non-price loan terms. It is possible that a bank reduces both loan spread and loan covenant requirement. It is also possible that a bank reduces loan spread but increases the requirement of loan covenants. Price term and non-price terms are inter-connected. Bank could strategically reduce loan spread but give restrictive non-price terms (Brick and Palia (2007)). Prior literature focuses on loan price, such as Erel (2011), Kahn et al. (2005), and Scott and Dunkelberg (2003). I study both price and non-price loan terms and find that local bank competition reduces both loan spread and covenant strictness. Third, prior research only looks at small and medium size loans in general. However, large corporate lending increases tremendously in recent years (Sufi (2007)). The loan size in existing papers are pretty small. The largest loan size in previous papers comes from Erel (2011). The average face value and average commitment value are \$0.73 million and \$5.3 million respectively, which is much smaller than the average loan size in corporate lending market, \$314 million. The bank competition effect on borrowing cost in the corporate lending market is different from the effect in the small and mid-size loan market. It is necessary to reinvestigate the relation between bank competition and borrowing cost.

I find that local bank competition not only reduces loan spread but also affects covenant intensity. For an average loan, I show that a borrower saves \$0.39 million in interest per year when

local competition increases one standard deviation. The number of covenants and loan strictness are reduced in a competitive market. Moreover, I find that non-investment grade firms drive the main results. Since non-investment grade borrowers have higher borrowing cost than investment grade borrowers, non-investment grade borrowers have weaker bargaining power with lenders than investment grade borrowers. Therefore, the benefits from local bank competition are significant for non-investment grade borrowers.

Local corporate lending competition is affected by several factors. First, bank consolidation affects local bank competition. From 1994 to 2010, the total number of banking institutions shrank from 10414 to 7015. The loan market overall is becoming more and more concentrated after bank mergers. For local loan markets, an "in-market" bank merger raises the market concentration level (Erel (2011)). When two banks operating in overlapping geographic areas merge together, the market power increases as well. However, an "out-market" bank merger doesn't change the number of local market participants. If bank consolidation saves operating costs, the newly consolidated bank competes aggressively in local market and thus increases bank competition. Second, new entrant banks compete with existing banks and promote bank competition. The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 allows banks to operate across states. Therefore, new entrant banks compete across states and also increase bank competition. Third, advancements in information technology make easy to expand the banks' business. After the 1990s, information technology has allowed banks to enlarge their business via online banking, ATM kiosks, etc., therefore pushing up bank competition in local markets. To conclude, bank competition varies from one market to another. Therefore, it is better to measure the level of bank competition in each market.

It is worth investigating bank competition effects on corporate bank loans. First, bank lending is an important channel for a public firm's external financing. According to Sufi (2007), new syndicated loans grow from $137 million in 1987 to about $1 trillion in 2003. It's important to know the impact of bank competition on corporate lending markets. Second, LPC DealScan provides detailed loan characteristics. By merging LPC DealScan data with Compustat, we can control

both firm and loan characteristics. Previous papers have neither detailed firm variables, such as Z-score, growth opportunities, and profitabilities, nor detailed loan characteristics, such as performance pricing, loan purpose, loan types, etc. The control of detailed firm and loan characteristics alleviate the concerns of unobserved firm and loan characteristics in the analysis.

The chapter contributes to the syndicated loan literature. Existing research on syndicated loans covers various areas, such as the role of information asymmetry on syndicated loan structure (Sufi (2007)), information asymmetry effects on loan spread (Ivashina (2009)), loan contracting as a mechanism to facilitate loan sales (Drucker and Puri (2009)), covenant violation and firm investments (Chava and Roberts (2008)), corporate misreporting and loan contracting (Graham et al. (2008)), and dual holding and loan spread (Jiang et al. (2010)). The chapter adds to this literature by examining the relation between local bank competition and syndicated loan contracting. To my knowledge, this is the first research to analyze how local bank competition affects loan contracting.

Kahn et al. (2005) use deposits in local markets and analyze the effects of bank consolidation on consumer loans. Similar to Kahn et al. (2005), this chapter uses deposit concentration measurement as a proxy of bank competition in local markets. It is true that deposit concentration measurement may be problematic, since some finance companies participate in corporate lending market. However, the majority of bank loans are made by commercial banks, which weakens the concern of non-bank lenders. I also use bank loans in local markets to directly measure bank competition. However, the number of loans in most areas is very limited, making the loan-based competition measurement noisy. To my knowledge, deposit concentration measurement is the best choice.

The chapter is organized as follows: Section 1.2 reviews the bank competition and syndication literature; Section 1.3 describes data, variables and summary statistics; Section 1.4 shows empirical results and Section 1.5 provides concluding remarks. The appendix provides detailed information about variables used in the chapter.

1.2 Related Literature

Previous research on local bank competition mainly focuses on small business loans and consumer loans, such as bank consolidation and its effect on small and mid-size business loan spread. For example, using the Federal Reserve Board's Survey of Terms of Business Lending, Erel (2011) finds that bank mergers save operating costs and thus reduces loan spread. She also finds that the results can be reversed when market power effect dominates the cost saving effect. Kahn et al. (2005) find that personal loan interest rates increase after bank consolidation, but they do not find that automobile loan interest rates increase after bank mergers. Park and Pennacchi (2009) show that bank mergers harm depositors but benefit borrowers. Large banks have a significant funding advantage and increase loan competition. However, mergers reduce the deposit competition, especially competition in less concentrated markets.

Other papers directly measure local bank competition by loan data and study its impact on both price and non-price terms. Petersen and Rajan (1995) use data from the National Survey of Small Business Finances and find that small firms in more competitive areas have higher borrowing cost. Using the Belgium banking data, Degryse and Ongena (2005) find a negative relation between local market competition and borrowing cost. They also confer spatial price discrimination in bank lending. Loan rates decrease with distance between the firm and lending bank, and increase with the distance between the firm and the competing banks. Similar to previous literature, Degryse and Ongena (2005) focus on small business loans. The main finding in their paper is that the distance between lender and borrower and between lender and competitor affect loan prices in Belgium. Instead, this chapter focuses on the corporate lending market, especially the lending market for public firms, and how local market competition affects loan contracting.

Prior papers do not find a consistent relation between local market power and loan prices. Petersen and Rajan (1995) and Degryse and Ongena (2005) find a positive relation between small firm borrowing costs and bank competition. However, Erel (2011) finds that loan spread reduces after bank consolidation and the reduction only persists for three years after bank mergers. But she did find that in concentrated markets, operating cost saving was dominated by market monopoly

power, therefore the loan spread increases after bank consolidation. In this chapter, I study the effects of bank competition in the corporate lending market. The size of borrowers is larger than the size of firms in prior papers. The results of large borrowers are different from small borrowers. As argued by Petersen and Rajan (1995), competition damages the mutually beneficial relation between firms and creditors. That's because creditors cannot expect to share in the future surplus of the borrower, then they will charge a higher interest rate in a high competitive market. Contrarily, creditors charge a lower interest rate when they can share the future surplus of cash flows from borrowers, which is possible in less competitive markets. However, the argument is that small firms may be not so important for large companies. The uncertainty of future cash flows of large companies is small. The motivation of sharing future surplus by forming mutually beneficial relation is weaker between large firms and creditors. Therefore, the competition effect may dominate the profit sharing effect in a corporate lending market. I find a negative relation between public firm lending costs and bank lending competition.

Bank merger also affects the non-price terms of loans. Scott and Dunkelberg (2003) study the effect of bank mergers on small business loans. They illustrate that the average searching cost for a new bank becomes higher after a merger, non-price terms, such as collateral, services with fees, and required services, increase after a merger, and the quality of services delivery reduces. I investigate the effect of bank competition on the number of financial covenants and general covenants, such as sweeps, dividend restrictions, and on loan strictness.

I explore loan contracting in competitive and non-competitive local markets. It contributes to loan contracting literature. Sufi (2007) shows that moral hazard and information asymmetry affect on the syndicated loan structure. When a borrower needs intensive monitoring, the share of lead arranger increases. When information asymmetry between a lend arranger and a borrower is severe, the lead arranger selects participants close to the borrower. Ivashina (2009) estimates the information asymmetry effects on loan spread. Taken into account the information asymmetry and diversification effect of lead arranger, information asymmetry takes 4% of the total loan spread in equilibrium. Drucker and Puri (2009) show that loan contracting as a mechanism to mitigate

agency and information asymmetry problems in loan sales. Covenants implement restrictions on borrowers' operation and protect lenders' benefits when a borrower has financial problems, and provide lenders a chance to intervene a borrower when one of the covenants is violated. Chava and Roberts (2008) find the technical default on bank loans affects the investment of firms, which is more severe on firms with agency and information problems. Graham et al. (2008) analyze how corporate misreporting affects bank loan contracting. Corporate misreporting creates information uncertainty. Lenders ask more loan spread and require more restrict non-price terms after misreporting. For lender structure, number of lenders decreases and transaction fees increase after corporate misreporting. Jiang et al. (2010) show that loan spread is lower when shareholders are creditors. Dual holders can reduce the conflicts between creditors and shareholders, and thus charge less loan spread.

I also show the asymmetric effects of local bank competition on investment grade and non-investment grade borrowers. Hale and Santos (2009) show that banks charge differently among investment grade firms and non-investment grade firms. Specifically, they find that banks use their monopoly power to charge different loan spread for investment grade firms and non-investment grade firms. Besides loan spread, I show that banks charge differently on loan covenants for firms with different credit ratings.

1.3 Data, Variables and Summary Statistics

1.3.1 Sample Selection

I collect bank loans from LPC DealScan database, a product from Thomson Reuters. This database contains detailed bank loan information, such as loan spread, size, maturity, loan types, loan purpose and loan covenants. DealScan covers bank loans to a large extent. According to Carey and Nini (2007), Dealscan contains 50-70% of all U.S. commercial loan volume in the early 1990s, with coverage increasing to 80-90% from 1992 to 2002. Our sample period starts from 1995, since I require that bank deposit data are available for all of the empirical studies. Deposit data are from

the FDIC Summary of Deposits, which are available electronically after 1994. Usually, the deposit data are disclosed in October, November or December. Conservatively, I assume all deposit data are available at the end of each year. The availability of deposit data requires all bank loans to be made after 1995.

Besides loan characteristics, I also include firm characteristics in the analysis. Due to data availability of small business firms, prior papers only control loan characteristics. Since many DealScan loans are made by public firms, I merge DealScan data with Compustat data to get detailed information on firm characteristics, such as firm size, profitability, and market-to-book ratio. The control of firm characteristics alleviates the concern that heterogenous firm characteristics may affect the results of bank competition. I am able to merge Compustat and DealScan using the Compustat-DealScan link made publicly available by Michael Roberts and Wharton Research and Data Services (Chava and Roberts (2008)). I exclude all financial firms (SIC code from 6000-6999). I also exclude all foreign firms from my sample. This chapter analyzes the local bank competition in the United States. I do not extend the analysis to other countries due to the availability of deposit data.

Each loan in DealScan has a start date. According to Rhodes et al. (2004), practitioner estimates the average syndicated loan transaction takes for 2 months between the date a borrower awards a lead bank a mandate and the date the syndicated loan is effective. Murfin (2012) shows that the process may take as long as a month between the date a bank approves a term sheet and the date a bank receives a mandate. Similarly, I assume the time lag between contract starting date and contract effective date is 90 days. At the time the contract starts, I collect the available firm characteristics from Compustat which is used for loan lending decisions. I allow at least 6 months time lag for the annual firm information to become public (Fama and French (1992)).

1.3.2 Local Bank Competition

I define local markets as a Primary Metropolitan Statistical Area (MSA). which is defined by the Office of Management and Budget as a federal standard. An area is qualified for recog-

nition as an MSA if it includes a city of at least 50,000 inhabitants or an urbanized area of at least 50,000 with a total metropolitan area population of at least 100,000. An MSA consists of a core area that contains a substantial population nucleus, together with adjacent communities that have a high degree of social and economic integration within that core. MSA includes one or more entire counties, and some MSAs contain counties from different states. Based on the definition of an MSA, I think it is likely to be the most relevant market for local bank lending. Wells Fargo provides a very detailed map on corporate lending local centers, most of which are the cores of MSAs across the country. The map of Wells Fargo corporate lending can be found at http://wellsfargocapitalfinance.com/contact.php. Throughout the chapter, I refer to an MSA as a local market, and I used the MSA as defined by the 2000 Census. According to Pirinsky and Wang (2006), the change of MSA definition is very small in recent years, although the MSA is redefined every 10 years. Similarly, Kahn et al. (2005) use MSA level market concentration measurement to analyze the price of consumer loans.

Local bank competition is measured by the Herfindahl-Hirschman Index (HHI) of bank deposit shares in each MSA. High Herfindahl Index means high local bank concentration and low local bank competition. FDIC Summary of Deposit data contain branch level deposit data. Based on the information of deposit locations, I categorize the deposits for each bank at each MSA and aggregate the total deposit at each MSA.

I also construct the Herfindahl Index of bank loans in each MSA. To identify the locations of borrowers, I obtain firm headquarter zip codes from Compustat. Based on the zip codes, I find state and county Federal Information Processing Standards (FIPS) codes for each headquarter. Finally, using the state/county FIPS code, I identify the MSA information for each borrower. For each loan made at a MSA, I calculate the shares of banks in that loan. Then I aggregate the total lending of each bank and calculate the shares of bank lending in that local market. However, the number of loans are very limited in many MSAs, making the measurement of loan concentration problematic. I enclose the results in the appendix.

After I obtain the Herfindahl Index for each MSA, I match it with each firm which operate

its business mainly in that location. To identify the main business in a local area, I use the firm headquarters as a proxy. Usually, a headquarter is the place where the firm conducts the majority of business. The firm managerial team is located in that area and makes critical decisions, which includes borrowing decisions. They are very likely to contact the local banks who operate around the headquarters, especially banks with branches in the area.

One potential problem for firm headquarter data is that Compustat only reports the current firm headquarters. However, existing evidence shows that changes in firm headquarters are very rare and using the current headquarters from Compustat will not significantly affect the results (Peterson (1988), Romano (1985), Bertrand and Mullainathan (1999)).

Generally, bank lending markets become more and more concentrated over time due to the wave of bank consolidations in the 1990s. The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 allows nationwide branching and facilitates bank consolidations. From 1994 to 2007, the year before the 2008 financial crisis, the total number of US banking institutions drops around 28.5%, from 10414 in 1994 to 7444 in 2007 [1]. From Table 1.1, we see that the total number of banking institutions shrinks year by year.

Although the total number of banks decreases over time, the local bank competition level does not necessarily go down. It is true that bank mergers can potentially increase bank market power if it is conducted "in-market" which means two banks have overlapped markets (e.g. Erel (2011)). "in market" merger reduces the number of competitors in overlapped local markets, thus decreasing bank competition in those local markets. However, the effect of an "out-market" bank merger, two banks have non-overlapped markets, on local bank competition is uncertain. Obviously, the number of banks in a local market is fixed in the "out market" merger case. Market concentration depends on how aggressively the new consolidated bank competes with the existing competitors. If bank mergers save operating costs, then newly consolidated banks are more competitive in the local markets and bring up the competition level.

Geographic deregulation and technology advancement also impact the local bank competition.

[1] Data come from FDIC summary of deposits. Banks under the same bank holding company are considered the same bank.

The geographic deregulation allows outside banks to enter local markets and bring in more competition. If the new entrant competes aggressively and wins lots of shares from existing players, then the market could be concentrated afterwards. Moreover, due to the advancement of information technology, banks can deliver financial services in new ways, such as online banking, making the local market more competitive.

The local banking market competition level varies market by market. In Figure 1.2 , I list deposit Herfindahl Index in Atlanta, Boston, Chicago, Dallas, Houston, Los Angeles, New York and San Francisco from 1994 to 2012. The total number of banks and deposit Herfindahl Index are included in all graphs. First, the total number of banks and bank competition are highly correlated but not always positively related, because number of banks is not equivalent to the dispersion of bank shares. Second, market concentration varies from one MSA to another. The markets of New York and San Francisco are becoming less competitive over time. Bank competition in Atlanta, Boston and Houston is pretty volatile. Bank deposits are highly concentrated in some years but become dispersed in other years. For certain years, competition levels jump up and down around 0.1 in those three areas. There is a spike of competition in Chicago in 1995 and 2009 and in Dallas in 2005. For other periods, the competition level is stable and doesn't change too much over time. To conclude, not only are the patterns so different at different MSAs, but also the competition level is changed MSA by MSA and year by year. The variation of deposit market concentration provides a chance to test the relation between local market competition and cost of corporate borrowing.

I also report the changes of the number of banks and market concentration from 1990 to 2010 in Table 1.2. For the number of banks, 230 cities experience an increase in the number of banks, while 101 cities have a decrease in the number of banks in local markets. For market concentration measured by deposit-based HHI, 170 cities have an increase in market concentration, while 189 cities show a decrease in market concentration. 31 cities have an increase in lending-based HHI, while 33 cities have a decrease in lending-based HHI. The difference of observations between deposit-based HHI and lending-based HHI comes from how we construct the measurements. Lending-based HHI is constructed by bank loan, which is a flow variable. Big cities with frequent bank lending are

more likely to have continuous observations. Deposit-based HHI is constructed by deposit variable, which is a state variable. Deposit distribution among banks in a local area is continuously observable over time. From both deposit-based and lending-based HHI, I find that the variation of concentration level in local areas is huge.

1.3.3 Loan Spread

I measure loan spread by all-in-drawn loan spread over the London Interbank Offered Rate (LIBOR), including annual fees, upfront fees and utilization fees if provided by DealScan. Since the upfront fee is only paid once at the time the loan contract starts (Ivashina (2009),Graham et al. (2008)), I also provide all-in-drawn spread net of upfront fee and find the main results of the chapter do not changed qualitatively. To mitigate the skewness of all-in-drawn spread, I also use the natural logarithm of the loan spread (Graham et al. (2008), Chava et al. (2009)) in robustness checks.

1.3.4 Loan Covenants

Covenants play an important role in loan contracts. Banks use covenants as a monitoring mechanism. When a firm violates loan covenants, banks will renegotiate with that firm and influence its investment and financial policies. I measure loan covenant intensity by several different dimensions. One is the number of loan covenants. Loan covenants includes financial covenants and general covenants. Financial covenants include different types of financial ratios, such as Debt-to-EBITDA ratio, Current ratio, etc. These financial ratios must be maintained when a bank loan is used by a borrower. General covenants include restrictions on prepayment, dividends and voting rights. Prepayment covenants contain an equity issuance sweep, excess cash flow sweep, excess asset sweep, excess debt issuance sweep, and insurance proceeds related to collateral. Dividend restriction limits the dividend payment level and protects the claims of debt-holders. Covenant voting rights specify the proportion of lenders required to approve any change of loan agreements. Bradley and Roberts (2004) use the information of financial and general covenants and create a

loan intensity index. The difference is that Bradley and Roberts (2004) aggregate the two types of covenants together in one measurement. In this chapter, I provide results of both aggregated and separate covenants. The average number of loan covenants is 5, whereas the number of general covenants is 2.9, and the average number of financial covenants is 2.4. These numbers are slightly different from one used in Graham et al. (2008), since their sample only contains firms with misreported accounting information. Following Bradley and Roberts (2004) and Graham et al. (2008), I also provide poisson regression for the number of loan covenants.

The other one is loan covenant strictness. Murfin (2012) constructs a strictness measurement that reflects the number of covenants, slackness, scale and covariance of covenants. Compared to prior covenant strictness measurements, this is a significant improvement. Chava and Roberts (2008) only consider two types of financial covenants and only consider the distance to default as a measurement of covenant strictness. Distance to default doesn't take the variation of financial ratios and the scale of financial ratios into account. Demiroglu and James (2010) cluster firms with similar financial ratios together and consider the financial ratio threshold about the median as a tight financial covenant. However, they only consider two types of financial covenant as well. This cluster-type measurement is better than the distance-to-default measurement because it considers the heterogeneity of financial covenant thresholds across firms. Murfin (2012) consider the financial ratios of a borrower following a multivariate normal distribution. The probability of hitting a threshold of a financial covenant reflects the strictness of loan covenants. Under this framework, I can incorporate as many covenants as necessary without losing observations. It is easy to aggregate different covenant information and put it into one measurement. In prior settings, I require that the covenant information is not missing. But in the framework of Murfin (2012), missing financial covenants are considered a slack on that dimension. Murfin (2012) shows that his measurement predicts future covenant violation after controlling slack of financial covenants and number of financial covenants.

Consider an $N \times 1$ vector of financial ratios r. The financial ratios receive a N dimensional shock in the future. Then next period financial ratio r' follows

$$r' = r + \varepsilon \sim N_N(0, \sum) \tag{1.1}$$

When one of the elements of r drops below the threshold, the covenant is breached. The probability of violating a covenant is expressed as $1 - F_N(r' - r)$. $F(.)$ is a CDF function.

Empirically, I estimate the variance-covariance matrix by using the past 10 years financial ratios in an industry, defined as a one-digit sic code in each year. I drop the contract which violates financial covenant when contract starts. In that case, I think the data is problematic and therefore do not rely on the information. The financial ratios I use to calculate loan covenant strictness are the most frequent loan covenants in DealScan, which are minimum EBITDA to debt, current ratio, quick ratio, tangible net worth, net worth, EBITDA, fixed charge coverage, interest coverage, maximum debt to equity, debt to tangible net worth and CAPX.

The sample of loan strictness is smaller than the sample of loan spread, because lots of loans do not provide covenant information. However, DealScan covenant table starts at 1995 and the coverage becomes much better in later years. My sample size is 2537 for covenant strictness. The sample size is very similar to Murfin (2012), in which there are 2642 loans in total.

1.3.5 Control Variables

To study the effect of local bank competition on borrowing cost, I should control for other factors that might affect loan spread or loan covenants. These factors include firm characteristics, loan characteristics, industry fixed effects, MSA fixed effects and year fixed effects.

For firm characteristics, I control firm size, leverage, market-to-book ratio, profitability, and modified Altman (1968)'s Z score [2]. Large firms have less information asymmetry than small firms due to having a longer history of operation, more analyst coverage, a better reputation or better access to capital markets. Therefore, I expect that large firms have a lower loan spread and less loan covenants than small firms. Profitability, leverage, and Z score determine the default

[2] I modify Z-score by excluding market-to-book ratio, because market-to-book ratio is a control variable in the regression.

probability of firms. A higher profitability implies a high probability to pay back interest and principal in future. A low leverage means a borrower has a higher probability to maintain its financial health. Z score is widely used to proxy as a default probability measurement in empirical studies. I modify Z score since I include growth opportunities in all regressions. Intuitively, these variables as proxies of default probabilities affect loan spread and loan covenants. Market-to-book ratios reflect a firm's growth opportunities. A firm with high growth opportunities has a high potential to pay back loan commitment and can have a low loan spread and loose loan covenants, other things considered equal.

For loan characteristics, I control loan size, loan maturity, performance pricing dummy, security dummy, loan type and loan purpose. Loan size reflects the economics of scale of lending. Thus, loan size may be negatively related to loan spread and the number of loan covenants. Loans with long maturity have high uncertainty in future. Therefore, I expect that loan maturity is positively related to loan spread and loan covenant strictness. A firm with a performance pricing clause adjusts borrowing costs automatically when its performance changes. So, I believe that firms with performance pricing are different than those without. One argument is that the lender can adjust the loan price easily, therefore the lender can offer a lower borrowing cost if a firm agrees to use the performance pricing clause. Another argument is that risky firms are more likely to have a performance pricing clause since they have a lot of uncertainty of future performance. Then, it implies that lenders are more likely to give them a higher borrower cost. The recovery rate is higher for a loan with collateral clause, so lenders charge less for loans with collateral. I control secured dummy in the analysis. Since DealScan loans contain missing information of loan collateral, I control those observations by including the missing security dummy. Besides the variables above, I also control loan types in all regressions. It is possible that lenders charge differently on loan spread and loan covenants by offering either term loans or revolvers. I control loan purpose as well. The majority of the loans are used for corporate purpose, M&A, and debt repayment. I use dummy variables to control M&A and debt repayment.

I get credit rating information from Computstat long-term S&P credit rating. The credit ratings

are controlled for each loan in this chapter. It is used as a proxy of firm default risk. I used BBB- as a benchmark for other credit ratings. So, the coefficient of other ratings are interpreted as an incremental effect of BBB- rated firms. For firms without a credit rating, I drop it out of my sample, since the variation of these firms are very large. The Z score of non-rated firms varies from -29.94 to 6.64, while the z score of rated firms, which include both investment grade and non-investment grade firms, ranges from -9.25 and 5.44. Including non-rated firms in my sample will create unclear results. I delete firms which are already in default in the S&P crediting rating database, since it involves firm bankruptcy clearing and debt recovery issues, which creates complexity for my main research topic.

The main variable in my analysis is the deposit Herfindahl Index at each MSA. I investigate the relation between bank competition and loan spread or covenant strictness. It is possible that some geographic related factors may impact the main results, in particular, the relative strength of economic conditions cross MSAs, the ranking of population sizes, and the physical size of MSAs. More or less, these factors are constant across MSAs. The MSA fixed effects will capture the effects from those factors. MSA dummies control any time invariant factors from local markets. I also control time trend, which captures any time variant factors, such as loan market conditions and macroeconomic factors. I use Fama-French 48 industries to control potential differences in risks and debt pricing structures across industries. All control variables are winsorized at 0.5 and 99.5 percentiles.

1.3.6 Summary Statistics

Panel A in Table 1.3 describes loan characteristics. The average (median) loan size is 561 (300) million dollars with an average (median) loan maturity around 46 (58) months, which is almost 4 (5) years on average (median). The mean loan spread is 163 basis points on top of LIBOR and the median loan spread is 125 basis points, which shows the distribution of my sample is slightly skewed. On average, 42.4% of bank loans have collateral, while 23% of them are debentures and 34.6% of them have missing collateral information. The above loan information is similar to the

one in previous papers, such as Jiang et al. (2010)) and Graham et al. (2008). Relationship banking is a dummy variable, which equals one if one of the lead arrangers has a prior lending relationship with the borrower in the past five years. Most of the loans are from prior lenders. At the facility level, 72.7% of loans are from relationship banks. At the package level, 75.2% of packages are from relationship banks [3].

Panel B shows the information of loan covenants and number of participants and lead arrangers in each package. The loan covenants are at the package level. Each package contains several facilities. It may include several revolvers and term loans. It shows that the total number of covenants are 4.95 on average, with 2.9 general covenants and 2.35 financial covenants on average. The mean loan strictness is 0.199 with a standard deviation of 0.198, which is very similar to the descriptive statistics in Murfin (2012). It shows that the probability of hitting one of the financial covenant on average is 19.9%. The average number of lenders for each loan is 9.5 and the average number of lead arrangers is 1.4.

Panel C reports firm characteristics. The average firm size is 7.38 billion dollars and average leverage is 35.7%. Return on assets, which measures firm profitability is 13.8%. The average market-to-book ratio and modified Altman's z-score is 1.723 and 1.523, respectively. More than 54% of firms have investment grade credit rating.

Panel D shows the description of deposit Herfindahl Index. The average HHI is 0.14. The US Justice Department considers the Herfindahl Index in excess of 2,500, which is 0.25 in my measurement, as highly concentrated and the Herfindahl Index between 1,500 and 2,500, which is between 0.15 and 0.25 in my case, as moderately concentrated. So, deposit markets are pretty competitive in most MSAs. Transactions that increase the index by 200 points, which is 0.02 increment, in highly concentrated market are likely to enhance market power under the Horizontal Merger Guideline issued by Justice Department. The standard deviation of the Herfindahl Index

[3] I collect top 300 lenders (lead arrangers) from DealScan, who lend more than 90% deals. To avoid misclassification of relationship lending, I trace all mergers and acquisitions or name changes of each lender, and replace a subsidy by its parent company. Then, I check historical lead arrangers for packages in a five-year window. If one of lead arrangers repeatedly lends money to the firm, I mark the current package as a relationship loan. The sample size of relationship banking loans is slightly smaller than the initial sample, since I restrict the top 300 leaders to make hand collecting practical.

is 0.075, which is 705 points as defined by the US Justice Department. It shows that the variation of bank competition in the local market is large. On average, each year there are 87 MSAs in our sample, which is 25% of all MSAs in United States. [4].

1.4 Empirical Specification and Results

1.4.1 Empirical Specification

In this section, I show that after controlling the firm and loan characteristics and industry, year and geographic fixed effects, loan spread is positively related to the Herfindahl Index, which shows loan spread is negatively related to local bank competition. To test the effect of local bank competition on loan spread, I run the following regression model:

$$\begin{aligned} \text{Loan Spread} = f(&\text{Deposit HHI, Firm Characteristics, Loan Characteristics, Rating} \\ &\text{Dummies, Year Indicators, MSA Indicators, Industry Indicators}) + \varepsilon \end{aligned} \tag{1.2}$$

The dependent variable in (1.2) is the all-in-drawn loan spread. The key independent variable is deposit Herfindahl Index, which measures local bank competition. High Herfindahl index means concentrated market shares and low bank competition. If local bank competition reduces loan spread, I expect a positive and statistically significant coefficient of deposit Herfindahl Index. All other control variables are discussed in Section 1.3. Data definitions and measurement details are reported in Appendix A.1. We use OLS regression for loan spread analysis, and standard errors are all clustered at the package level, since each package contains several facilities which are correlated within each package.

For covenant analysis, I use similar equation of loan spread analysis, with additional covenant controls. Covenant variables include number of covenants, number of financial covenants, number

[4]Based on 2000 Census, United States has 359 MSAs. MSAs without public firm headquarters are discarded in my sample, since I require firm characteristics are all available in my analysis.

of general covenants, and loan strictness. All regressions are OLS regressions. Since covenants are written at package level, all observations are unique for each package. Prior research use Poisson regression to test number of covenants. The main results are qualitatively similar when I use a Poisson regression instead of an OLS regression.

$$\begin{aligned} \text{Covenant Variables} = f(&\text{Deposit HHI, Firm Characteristics, Loan Characteristics,} \\ &\text{Covenant Controls, Rating Dummies, Year Indicators, MSA} \\ &\text{Indicators, Industry Indicators}) + \varepsilon \end{aligned} \tag{1.3}$$

1.4.2 Local Bank Competition and Cost of Bank Debt

The regression result of loan spread is reported in Table 1.4. I show that loan spread is positively related to local bank competition. Coefficient of deposit Herfindahl Index is significantly positive. One standard deviation increment of deposit Herfindahl Index corresponds to 7 basis point increase of all-in-drawn loan spread, which leads to additional $0.39 million annual interest payment. The result is consistent if I use logarithm of all-in-drawn loan spread.

Borrowers with high leverage pay high loan spread, since they have high default probability. Borrowers with high Market-to-Book ratio have lots of growth opportunities on hand and they pay lower loan spread. Interestingly, firm size is positively related to loan spread. Loan spread of large loan is smaller than one of small loans due to the economics of scale. With a performance pricing clause, the lender can adjust loan spread to future firm performance. Lender reduces loan spread 32 basis points if loan contract contains a performance pricing clause. The coefficient of secured loan dummy is positive. Because lenders are likely to require collateral if borrowers are risker. The dummy of secured loan captures the effects of both loan collateral and borrower's risk characteristics.

For loan purpose, loans for mergers and acquisitions are charged 20.45 more basis points than loans for corporate purposes. I do not find a significant different between loans for debt repayment

and loans for corporate purpose. For loan types, generally term loans are more expensive than lines of credit.

Table 1.5 shows that local bank competition not only affects loan spread, but also affect loan covenants. I investigate the local bank competition on the number of all covenants, number of financial covenants, number of general covenants and loan strictness. Column 1 reports that deposit Herfindahl Index is positively related to the number of all covenants. Borrowers operating in a highly competitive market receive less loan covenants. In column 3, I find similar results for the number of general covenants, which includes sweeps, insurance proceeds related to collateral, dividend restriction, and covenant voting rights. I do not find significant coefficient of number of financial covenants in column 2. However, the coefficient shows that local bank competition and number of financial covenants are positively related. Further, I collect all financial covenants and aggregate the covenant information in the multivariate normal distribution framework. I find that local bank competition is positively and significantly related to loan strictness of financial covenants. One standard deviation increment of deposit Herfindahl Index is related to 1.6% increment of loan strictness. To conclude, local bank competition affects both price and non-price terms of loan contract.

I also find that firm size and growth opportunities are negatively related to all covenant intensity measurements. Leverage is positively related to covenant intensity. Borrowers with long maturity loans have more covenants, since there is more uncertainty of long maturity loans. Interestingly, covenant intensity of large loans is higher but spread of large loans is lower. Lenders intend to monitor borrowers with large loans. Secured loans are correlated to covenant intensity. It is likely that lenders require more covenants when a loan is required to have collateral. Compared to loans for corporate purposes, loans for mergers and acquisitions and loans for debt repayment have more covenants in general.

1.4.3 Local Bank Competition, Relationship Banking and Loan Contracting

This section shows that loans from relationship banks have a favorable loan spread. However, relationship banking doesn't affect loan covenants. This section also demonstrates that local bank competition affects loan price and covenants after considering the effect of relationship banking. It is true that concentrated markets contain less banks. Borrowers in concentrated markets have less choice of lenders and more likely borrowers get loans from the same bank each time. If relationship banks charge more for borrowers, it could contaminate my main results.

Relationship banking has mixed implication on loan contracting. First, relationship banking reduces information asymmetry between the borrower and lender. From prior lending activities, a commercial bank gradually learns about a borrower's characteristics. Therefore, a bank charges less for loan price and loan covenant requirements. Second, relationship banking holds up the borrowers. Non-relationship bank has less information on borrowers. So, borrowers make a negative signal when it switches from relationship bank to non-relationship bank. It is likely that non-relationship bank charges a high loan spread for the switching borrowers.

Table 1.6 shows that loan spread is about 7.5 basis points lower when the loan is from a relationship bank. I find the evidence to support the information asymmetry effect of relationship banking. In an unreported regression table, I find that relationship banking doesn't affect the relation between local bank competition and loan contracting. I test it by including an interaction term of relationship banking dummy and deposit Herfindahl Index. Table 1.7 shows that relationship banking has no effect on most measurements of loan covenant intensity. To sum up, I find the evidence to support information asymmetry hypothesis of relationship banking and relationship banking affects loan spread but not loan covenants.

1.4.4 Local Bank Competition, External Financing, and Loan Contracting

Holding local bank competition constant, firms with better access to external markets have high bargaining power with banks. As a result, firms with better access to bond markets will get more favorable loan terms than those without. I use credit rating as a proxy for bond market

access. I divide bond rating by investment grade and non-investment grade. Firms with investment grade have low external financing costs and have higher bargaining power with commercial banks. For firms with non-investment grade, the external financing cost is very high and therefore their bargaining power is low when they negotiate with commercial banks. Hale and Santos (2009) use similar methods to test whether a bank charges more loan spread for firms with investment grade rating than for firms with non-investment grade rating. I show that the effect of local bank competition on loan spread mostly from the group the non-investment grade borrowers. It is not a surprise to observe the results. Borrowers with non-investment grade have weaker bargaining power with banks, and they are more likely to get more benefits when banks compete fiercely with each other. However, borrowers with investment grade have stronger bargaining power, and benefit less when bank competes aggressively with each other.

I show that the local bank competition effect on loan spread is mainly driven by firms with non-investment grade ratings. I split the effect of local bank competition into two parts: investment grade firms and non-investment grade firms. Table 1.8 shows that the coefficient of local bank competition effects on non-investment grade firms is more than two times larger than coefficient of local bank competition effects on investment grade firms. Moreover, the impact of local bank competition on non-investment grade firms are significantly positive.

I also find that local bank competition effects on loan covenants is mainly driven by non-investment grade firms. Table 1.9 demonstrates that the interaction term of deposit Herfindahl Index and non-investment grade dummy is positive and significantly related to number of all covenants, number of general covenants, and loan strictness, except for the number of financial covenants. The number of financial covenants is a noisy measurement of loan strictness since it doesn't take into account probability of covenant default. I do not find significant effect of local bank competition on investment grade firms.

1.4.5 Local Bank Competition and Lending Structure

I show that local bank competition doesn't affect the lending structure of borrowers. Ivashina (2009) argues that lenders strategically choose lending shares to avoid risk exposure on a borrower. For risky borrowers, lead banks choose more participants to share risk. I investigate whether local bank competition affects lending structure in this section. Besides information asymmetry and default risk of borrowers, borrowers locating in competitive market easily find more participants and lead arrangers to get loans.

I measure lending structure by number of lenders and number of lead arrangers. I don't find that local bank competition significantly affect the lending structure of loans. Similarly, I don't find any asymmetric effects of local bank competition on firms with investment grade and non-investment grade. All the results are shown in Table 1.10.

1.4.6 Robustness Tests

To reduce the influence of outliers and skewness of the loan spread distribution, I use logarithm of all-in-drawn loan spread as the dependent variable. The results in Table 1.11 show that local bank competition has a significant impact on loan spread, which is similar to the main results. All main regression controls geographic and industrial fixed effects. In a robustness test, I check whether time-invariant firm characteristics affect the main results. The industry and geographic fixed effects are omitted since I control firm fixed effect in the regression. I find a very similar coefficient of deposit Herfindahl Index in Table 1.12.

Prior studies use a Poisson regression to study the number of covenants used in a loan contract. In my main regression, I use OLS regression. To check whether the main results are robust to different regression methods, I re-run the loan covenant regression in Table 1.13.

I also test the effect of bank competition on loan spread and loan covenants controlling the local supply conditions. I use total deposit at each MSA as a proxy for local supply measurement. When local market is segmented, higher local deposit, more money available for local lending. I find that loan spread is lower in higher local deposit areas and loan covenants are less intensive in higher

local deposit areas. The main findings are consistent when I control the local supply conditions.

1.5 Conclusion

I study the effect of local bank competition on bank loans, since capital markets are geographically segmented and bank lends money locally. I find that local bank competition affects loan contracting in corporate lending markets. Prior literature shows the local bank competition reduces loan spread in the consumer loan market, small business loan market and mid-size commercial and industrial loan market (e.g. Scott and Dunkelberg (2003)). I find that not only does loan spread reduce in a competitive market, but also loan covenants are less restrictive in a competitive market.

The number of banks in United States has shrunk dramatically in recent years due to mergers and acquisitions. But at the local bank competition level, which is defined at MSA level, is not necessarily decreasing for all local markets. I use deposit concentration to measure local bank competition. I find a huge variation of local bank competition in local markets after the 1990s. The variation of local bank competition makes the empirical studies possible. On average, one standard deviation increment of local bank competition saves a borrower about $0.39 million in annual interest for an average loan. The increment of local bank competition also reduces the number of all covenants, especially the number of general covenants and strictness of financial covenants.

Moreover, I show that the effects of local bank competition on loan spread and loan covenants are mainly driven by firms with low credit ratings. I decompose the effect of local bank competition into effect on non-investment grade firms and effect on investment grade firms. Generally, non-investment grade borrowers have a higher cost of capital than investment grade borrowers. Investment grade firms have a higher bargaining power than non-investment grade firms. So, non-investment grade borrowers benefit more from competition than investment grade borrowers. I find evidence to support this hypothesis in the corporate lending market.

I also shown that local bank competition is not driven by relationship banking. If relation-

ship banking creates a hold-up problem between the lender and borrower, then it increases the loan spread. Non-competitive market usually contains less banks and has a high probability to repetitive lenders. It seems that the effect of local bank competition may be contaminated by relationship banking. Controlling relationship banking, I find that the coefficients of local bank competition on loan spread and loan covenant remain significant. I don't find evidence that the effect of local bank competition on loan spread and loan covenants is driven by relationship banking. In addition, relationship banking helps reduce loan spread. Because relationship banking reduces the information asymmetry between the lender and borrower. Finally, I don't find that lending structure is affected by bank competition at local markets. Neither the number of lenders nor the number of lead arrangers are affected by local bank competition.

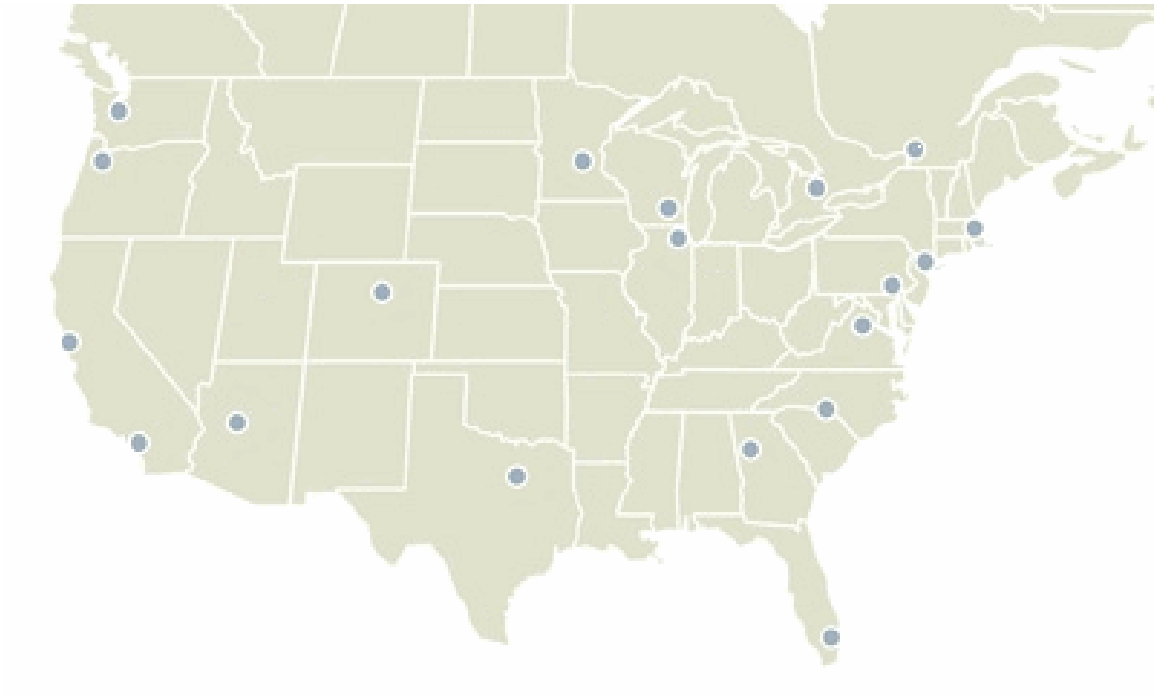

Figure 1.1: Map of Wells Fargo Corporate Lending Centers
Source: http://wellsfargocapitalfinance.com/contact.php

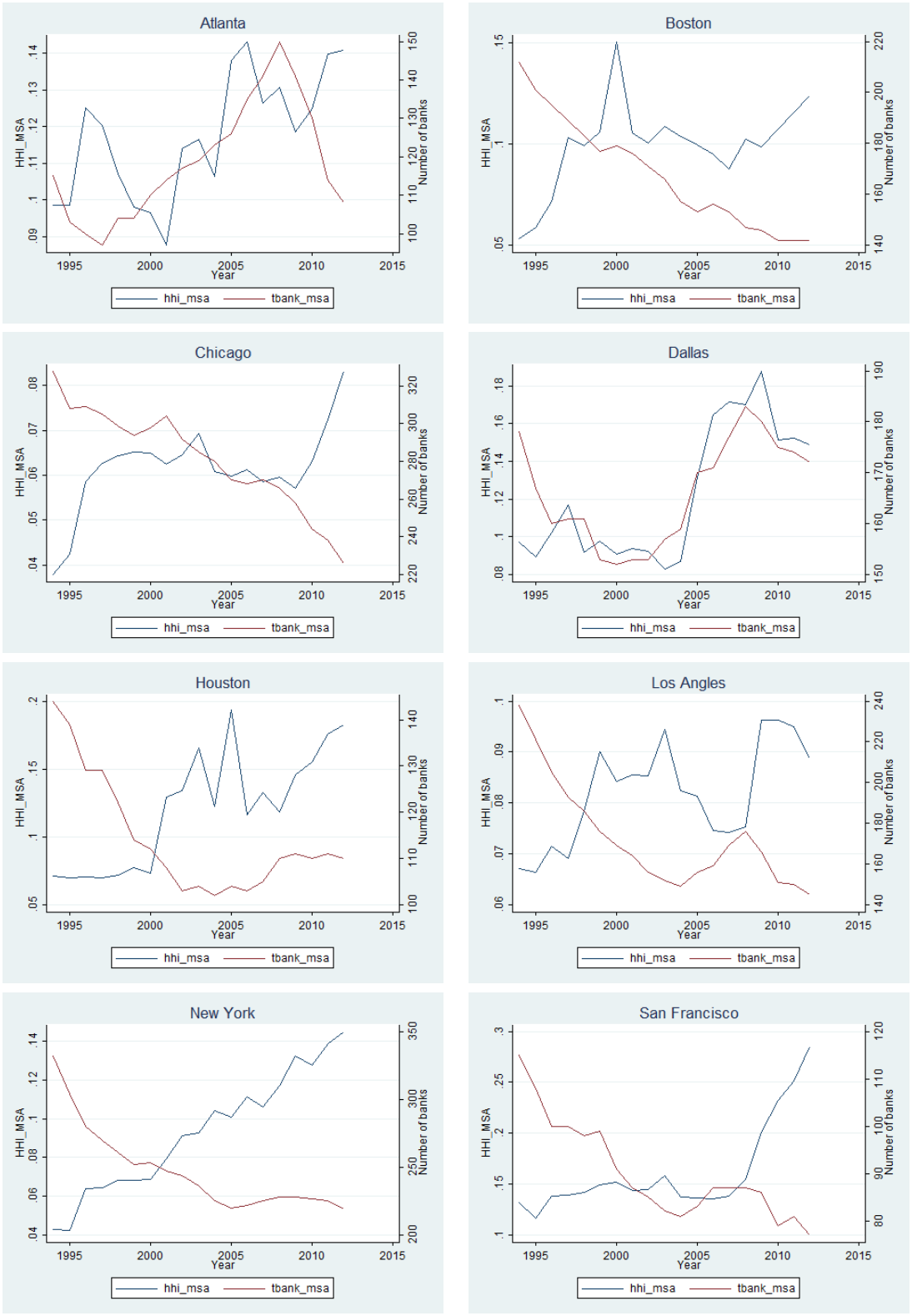

Figure 1.2: Deposit Herfindahl Index in Selected MSAs
Local bank competition time trend in Atlanta, Boston, Chicago, Dallas, Houston, Los Angles, New York and San Francisco

Table 1.1: Number of Banks from 1994 to 2010
Data comes from FDIC summary of deposits. Commercial banks under the same bank holding company are considered as the same firm. Data is reported on June 30 each year, but disclosed at the end of each year.

Report Date	Number of banks
6/30/1994	10414
6/30/1995	9823
6/30/1996	9421
6/30/1997	9109
6/30/1998	8743
6/30/1999	8449
6/30/2000	8321
6/30/2001	8170
6/30/2002	8031
6/30/2003	7877
6/30/2004	7756
6/30/2005	7644
6/30/2006	7582
6/30/2007	7444
6/30/2008	7351
6/30/2009	7219
6/30/2010	7015

Table 1.2: Changes of number of banks and HHI at MSA level

The data is from FDIC summary of deposits. The change of banks is measured by the difference between number of banks in 1994 and number of banks in 2007 at Metropolitan Statistical Area (MSA) level. The change of HHI is measured by the difference between HHI in 1994 and HHI in 2007 at MSA level.

Panel A: change of number of banks

	Number of MSAs
Positive change	230
No change	28
Negative change	101
Total MSAs	359

Panel B: change of deposit-based HHI

	Number of MSAs
Positive change	170
Negative change	189
Total MSAs	359

Panel C: change of lending-based HHI

	Number of MSAs
Positive change	31
Negative change	33
Total MSAs	64

Table 1.3: Summary Statistics
Panel A, B, C and D are summary statistics of loan characteristics, package characteristics, firm characteristics and deposit Herfindahl Index. Bank loan data come from DealScan. All-in-drawn spread is the loan spread on top of LIBOR. Data of firm characteristics come from Compustat. Deposit Herfindahl Index (HHI) is constructed by the deposit shares in each Metropolitan Statistical Area from FDIC Summary of Deposit Database. Metropolitan Statistical Area is defined as of 2000 Census. Relationship Banking is defined as whether one of the lead arranger has prior lending relationship with the borrower in the past five years.

Panel A: Loan characteristics

	count	mean	sd	min	p50	max
Loan Spread	9840	163.5	138.9	8	125	1500
Loan Size	9840	561.1	1059.3	0.259	300	30000
Loan Maturity	9840	46.32	26.18	1	58	252
Performance Pricing	9840	0.522	0.500	0	1	1
Secured Loan Dummy	9840	0.424	0.494	0	0	1
Missing Security Information	9840	0.346	0.476	0	0	1
Loan Purpose: Merger	9840	0.160	0.366	0	0	1
Loan Purpose: Debt Repay	9840	0.154	0.361	0	0	1
Term Loan Indicator	9840	0.257	0.437	0	0	1
Relationship Banking	8554	0.727	0.445	0	1	1
Observations	9840					

Panel B: Package Information

	count	mean	sd	min	p50	max
Loan Strictness	2537	0.199	0.198	0	0.141	0.838
Number of All Covenants	4789	4.954	2.783	0	4	14
Number of General Covenants	4700	2.920	1.940	0	2	7
Number of Financial Covenants	4249	2.354	1.152	1	2	7
Number of Lenders	8752	9.532	9.481	1	7	290
Number of Lead Arrangers	8274	1.360	0.627	1	1	20
Relationship Banking	7365	0.752	0.432	0	1	1
Observations	8754					

Panel C: Firm characteristics

	count	mean	sd	min	p50	max
Total assets	5737	7379.7	14407.8	24.59	2535.6	242223
Leverage	5737	0.357	0.198	0	0.333	1.745
Z Score	5737	1.523	1.162	-9.252	1.447	5.446
Return on Assets	5737	0.138	0.0758	-0.799	0.129	0.802
Market-to-Book	5737	1.723	1.032	0.430	1.424	23.08
Investment Grade	5737	0.541	0.498	0	1	1
Observations	5737					

Panel D: Local bank competition measurement

	count	mean	sd	min	p50	max
Deposit Herfindal Index MSA	1390	0.140	0.0695	0.0379	0.129	0.821
Observations	1390					

Table 1.4: Local bank competition and loan spread

The table represents regression of loan spread on firm characteristics, loan characteristics, rating dummies, year, industry and geographical fixed effects. The dependent variable is all-in-drawn loan spread. Deposit Herfindahl Index is deposit concentration at MSA level. The details of variable definitions and measurements of all other variables are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Standard errors are clustered at package level as well. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1) Loan Spread
Deposit Herfindal Index MSA	92.60**
	(2.45)
Log Total assets	6.744***
	(4.40)
Leverage	14.82*
	(1.73)
Z Score	0.800
	(0.43)
Return on Assets	-22.70
	(-0.99)
Market-to-Book	-4.680***
	(-3.46)
Log Loan Size	-11.72***
	(-8.64)
Log Loan Maturity	0.498
	(0.28)
Performance Pricing	-31.96***
	(-12.98)
Secured Loan Dummy	48.06***
	(12.32)
Missing Security Information	-8.795***
	(-3.44)
Loan Purpose: Merger	20.45***
	(6.18)
Loan Purpose: Debt Repay	-1.478
	(-0.43)
Term Loan Indicator	47.90***
	(17.43)
Constant	330.5***
	(11.11)
Rating FE	Yes
Industry FE	Yes
Year FE	Yes
MSA FE	Yes
Observations	9802
Adjusted R^2	0.649

Table 1.5: Local bank competition and loan covenants

This table includes regressions of number of all covenants, number of general covenants, number of financial covenants, and loan strictness. Covenant control includes debt to total net worth, current ratio, fixed charge ratio, log total net worth. The details of variable definitions and measurements are reported in the appendix. All regressions are OLS. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Number of All Covenants	(2) Number of Financial Covenants	(3) Number of General Covenants	(4) Loan Strictness
Deposit Herfindal Index MSA	3.346***	0.826	2.875***	0.211*
	(2.82)	(1.33)	(3.46)	(1.66)
Log Total assets	-0.449***	-0.166***	-0.243***	-0.0169*
	(-6.22)	(-4.76)	(-4.54)	(-1.72)
Leverage	0.803**	0.604***	0.402	0.315***
	(2.23)	(3.41)	(1.61)	(7.14)
Z Score	0.0430	0.0531**	0.0196	-0.0121*
	(0.77)	(2.18)	(0.45)	(-1.69)
Return on Assets	-0.169	-0.229	0.0107	-0.211**
	(-0.23)	(-0.56)	(0.02)	(-2.28)
Market-to-Book	-0.106*	-0.0409	-0.0911**	-0.0174***
	(-1.70)	(-1.21)	(-2.42)	(-3.06)
Log Loan Size	0.381***	-0.0512**	0.377***	0.00365
	(7.62)	(-2.03)	(10.48)	(0.55)
Log Loan Maturity	0.115**	0.100***	0.0298	0.00340
	(2.00)	(3.69)	(0.72)	(0.44)
Performance Pricing	0.686***	0.255***	-0.0887	0.0533***
	(6.45)	(4.89)	(-1.16)	(3.95)
Secured Loan Dummy	1.429***	0.331***	1.107***	0.0341**
	(12.48)	(6.46)	(13.31)	(2.57)
Missing Security Information	-0.0337	0.0341	0.0979	0.0120
	(-0.38)	(0.82)	(1.56)	(1.02)
Loan Purpose: Merger	1.248***	0.232***	0.966***	0.0626***
	(10.18)	(4.30)	(10.37)	(4.13)
Loan Purpose: Debt Repay	0.614***	0.165***	0.249***	0.0385***
	(5.54)	(3.00)	(3.18)	(2.89)
Constant	5.448***	3.073***	2.848***	0.407***
	(6.62)	(6.83)	(4.42)	(3.02)
Covenant Control	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	3528	3130	3465	1825
Adjusted R^2	0.468	0.435	0.423	0.336

Table 1.6: Local bank competition, relationship banking and loan spread

The table represents regression of loan spread on firm characteristics, loan characteristics, rating dummies, year, industry and geographical fixed effects. The dependent variable is all-in-drawn loan spread. Deposit Herfindahl Index is deposit concentration at MSA level. Relationship Banking is defined as whether one of the lead arranger has prior lending relationship with the borrower in the past five years. The details of variable definitions and measurements of all other variables are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Standard errors are clustered at package level as well. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1) Loan Spread
Deposit Herfindal Index MSA	77.71*
	(1.95)
Relationship Banking	-7.506***
	(-2.70)
Log Total assets	6.666***
	(4.06)
Leverage	11.33
	(1.31)
Z Score	-0.307
	(-0.17)
Return on Assets	-30.40
	(-1.27)
Market-to-Book	-2.985**
	(-2.28)
Log Loan Size	-11.54***
	(-8.20)
Log Loan Maturity	0.152
	(0.08)
Performance Pricing	-31.13***
	(-11.89)
Secured Loan Dummy	46.58***
	(11.10)
Missing Security Information	-11.09***
	(-4.16)
Loan Purpose: Merger	17.97***
	(5.11)
Loan Purpose: Debt Repay	-0.183
	(-0.05)
Term Loan Indicator	46.95***
	(15.97)
Constant	335.3***
	(10.77)
Rating FE	Yes
Industry FE	Yes
Year FE	Yes
MSA FE	Yes
Observations	8522
Adjusted R^2	0.668

Table 1.7: Local bank competition, relationship banking and loan covenants

This table includes regressions of number of all covenants, number of general covenants, number of financial covenants, and loan strictness. Relationship Banking is defined as whether one of the lead arranger has prior lending relationship with the borrower in the past five years. Covenant control includes debt to total net worth, current ratio, fixed charge ratio, log total net worth. The details of variable definitions and measurements are reported in the appendix. All regressions are OLS. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Number of All Covenants	(2) Number of Financial Covenants	(3) Number of General Covenants	(4) Loan Strictness
Deposit Herfindal Index MSA	3.060**	0.760	2.799***	0.0915
	(2.41)	(1.12)	(3.22)	(0.62)
Relationship Banking	0.127	0.109**	-0.0290	0.00756
	(1.35)	(2.40)	(-0.42)	(0.67)
Log Total assets	-0.420***	-0.157***	-0.244***	-0.0146
	(-5.44)	(-4.43)	(-4.22)	(-1.39)
Leverage	0.828**	0.587***	0.506*	0.313***
	(2.21)	(3.18)	(1.91)	(6.73)
Z Score	0.0639	0.0480*	0.0494	-0.0133*
	(1.13)	(1.93)	(1.10)	(-1.82)
Return on Assets	-0.375	-0.282	-0.247	-0.175*
	(-0.45)	(-0.65)	(-0.42)	(-1.84)
Market-to-Book	-0.144**	-0.0426	-0.110***	-0.0149**
	(-2.09)	(-1.10)	(-2.67)	(-2.31)
Log Loan Size	0.378***	-0.0487*	0.391***	0.00893
	(7.15)	(-1.81)	(10.01)	(1.17)
Log Loan Maturity	0.0910	0.0782***	0.00354	0.000223
	(1.54)	(2.81)	(0.08)	(0.03)
Performance Pricing	0.542***	0.194***	-0.151*	0.0564***
	(4.71)	(3.50)	(-1.80)	(3.88)
Secured Loan Dummy	1.345***	0.297***	1.060***	0.0276*
	(11.56)	(5.60)	(12.24)	(1.94)
Missing Security Information	-0.0283	0.0243	0.0922	0.0105
	(-0.31)	(0.56)	(1.39)	(0.84)
Loan Purpose: Merger	1.185***	0.219***	0.937***	0.0573***
	(9.14)	(3.73)	(9.36)	(3.35)
Loan Purpose: Debt Repay	0.583***	0.182***	0.224***	0.0343**
	(4.90)	(3.13)	(2.65)	(2.38)
Constant	5.555***	3.421***	3.061***	0.394***
	(5.36)	(6.37)	(4.52)	(2.67)
Covenant Control	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	3151	2824	3099	1664
Adjusted R^2	0.480	0.442	0.436	0.332

Table 1.8: Local bank competition, external financing and loan spread

This table tests the effect of local bank competition on loan spread of investment grade borrowers and non-investment grade borrowers. Credit rating information is from S&P long-term debt rating. The details of variable definitions and measurements are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating below B. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Loan Spread
HHI * Investment Grade	48.41 (1.09)
HHI * Non Investment Grade	108.6*** (2.61)
Log Total assets	6.760*** (4.41)
Leverage	14.96* (1.74)
Z Score	0.814 (0.44)
Return on Assets	-22.57 (-0.98)
Market-to-Book	-4.693*** (-3.48)
Log Loan Size	-11.76*** (-8.67)
Log Loan Maturity	0.502 (0.28)
Performance Pricing	-31.95*** (-12.99)
Secured Loan Dummy	47.92*** (12.32)
Missing Security Information	-8.980*** (-3.51)
Loan Purpose: Merger	20.45*** (6.19)
Loan Purpose: Debt Repay	-1.418 (-0.41)
Term Loan Indicator	47.86*** (17.45)
Constant	335.2*** (11.19)
Rating FE	Yes
Industry FE	Yes
Year FE	Yes
MSA FE	Yes
Observations	9802
Adjusted R^2	0.649

Table 1.9: Local bank competition, external financing and loan covenants

This table tests the effect of local bank competition on loan covenants of investment grade borrowers and non-investment grade borrowers. Credit rating information is from S&P long-term debt rating. Covenant control includes debt to total net worth, current ratio, fixed charge ratio, log total net worth. The details of variable definitions and measurements are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating below B. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Number of All Covenants	(2) Number of Financial Covenants	(3) Number of General Covenants	(4) Loan Strictness
HHI * Non Investment Grade	4.884***	1.107	3.843***	0.280**
	(3.44)	(1.55)	(3.86)	(2.22)
HHI * Investment Grade	0.555	0.293	1.220	-0.0386
	(0.43)	(0.45)	(1.38)	(-0.23)
Log Total assets	-0.452***	-0.166***	-0.245***	-0.0162*
	(-6.27)	(-4.78)	(-4.58)	(-1.66)
Leverage	0.830**	0.608***	0.420*	0.315***
	(2.31)	(3.44)	(1.68)	(7.14)
Z Score	0.0434	0.0529**	0.0203	-0.0121*
	(0.77)	(2.17)	(0.46)	(-1.68)
Return on Assets	-0.192	-0.235	-0.00397	-0.210**
	(-0.26)	(-0.57)	(-0.01)	(-2.27)
Market-to-Book	-0.107*	-0.0409	-0.0918**	-0.0174***
	(-1.72)	(-1.21)	(-2.43)	(-3.06)
Log Loan Size	0.374***	-0.0525**	0.373***	0.00306
	(7.50)	(-2.08)	(10.35)	(0.46)
Log Loan Maturity	0.118**	0.101***	0.0316	0.00365
	(2.06)	(3.73)	(0.76)	(0.48)
Performance Pricing	0.679***	0.254***	-0.0925	0.0530***
	(6.38)	(4.87)	(-1.21)	(3.92)
Secured Loan Dummy	1.436***	0.332***	1.112***	0.0345***
	(12.55)	(6.48)	(13.37)	(2.61)
Missing Security Information	-0.0325	0.0343	0.0995	0.0129
	(-0.37)	(0.82)	(1.59)	(1.09)
Loan Purpose: Merger	1.261***	0.235***	0.974***	0.0639***
	(10.28)	(4.34)	(10.46)	(4.22)
Loan Purpose: Debt Repay	0.624***	0.167***	0.256***	0.0400***
	(5.65)	(3.05)	(3.28)	(3.00)
Constant	5.733***	3.120***	3.009***	0.424***
	(6.97)	(6.93)	(4.68)	(3.19)
Covenant Control	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	3528	3130	3465	1825
Adjusted R^2	0.470	0.435	0.424	0.337

Table 1.10: Local bank competition and lender structure

This table tests the effect of local bank competition on lender structure. Credit rating information is from S&P long-term debt rating. The details of variable definitions and measurements are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Number of Lenders	(2) Number of Lenders	(3) Number of Lead Arrangers	(4) Number of Lead Arrangers
Deposit Herfindal Index MSA	-2.598		0.443	
	(-0.98)		(1.40)	
HHI * Non Investment Grade		-2.336		0.407
		(-0.77)		(1.14)
HHI * Investment Grade		-3.070		0.507
		(-0.95)		(1.60)
Log Total assets	0.422***	0.422***	0.0421***	0.0420***
	(3.83)	(3.84)	(5.39)	(5.39)
Leverage	-0.198	-0.198	0.155***	0.155***
	(-0.26)	(-0.26)	(3.07)	(3.08)
Z Score	0.0673	0.0674	0.000475	0.000488
	(0.59)	(0.59)	(0.05)	(0.05)
Return on Assets	-2.389	-2.388	-0.101	-0.102
	(-1.53)	(-1.53)	(-0.93)	(-0.94)
Market-to-Book	0.0602	0.0600	-0.00295	-0.00293
	(0.68)	(0.67)	(-0.37)	(-0.37)
Log Loan Size	3.514***	3.514***	0.106***	0.107***
	(32.17)	(32.23)	(9.08)	(9.13)
Log Loan Maturity	0.0624	0.0626	0.0318***	0.0318***
	(0.55)	(0.55)	(2.97)	(2.97)
Performance Pricing	4.128***	4.128***	0.0233	0.0233
	(18.26)	(18.26)	(1.41)	(1.41)
Secured Loan Dummy	-0.537	-0.540	-0.0196	-0.0194
	(-1.59)	(-1.59)	(-0.98)	(-0.97)
Missing Security Information	-1.426***	-1.427***	-0.0139	-0.0137
	(-5.57)	(-5.57)	(-0.58)	(-0.57)
Loan Purpose: Merger	-0.674**	-0.673**	0.0190	0.0188
	(-2.04)	(-2.03)	(0.81)	(0.80)
Loan Purpose: Debt Repay	-0.384	-0.383	0.00446	0.00429
	(-1.45)	(-1.44)	(0.26)	(0.25)
Constant	-13.99***	-13.94***	2.105***	2.101***
	(-6.56)	(-6.42)	(4.03)	(4.01)
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	7961	7961	7523	7523
Adjusted R^2	0.342	0.342	0.258	0.258

Table 1.11: Local bank competition and logarithm of loan spread

This table tests the effect of local bank competition on logarithm of loan spread. Credit rating information is from S&P long-term debt rating. The details of variable definitions and measurements are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Standard errors are clustered at package level. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Log Loan Spread
Deposit Herfindal Index MSA	0.672***
	(3.06)
Log Total assets	0.0145*
	(1.75)
Leverage	0.0968**
	(2.40)
Z Score	-0.00550
	(-0.60)
Return on Assets	-0.237**
	(-1.96)
Market-to-Book	-0.0288***
	(-3.08)
Log Loan Size	-0.0882***
	(-10.53)
Log Loan Maturity	0.0166*
	(1.76)
Performance Pricing	-0.0811***
	(-5.95)
Secured Loan Dummy	0.411***
	(16.98)
Missing Security Information	0.0400**
	(2.31)
Loan Purpose: Merger	0.187***
	(9.07)
Loan Purpose: Debt Repay	-0.0100
	(-0.56)
Term Loan Indicator	0.253***
	(19.39)
Constant	5.723***
	(39.12)
Rating FE	Yes
Industry FE	Yes
Year FE	Yes
MSA FE	Yes
Observations	9802
Adjusted R^2	0.788

Table 1.12: Local bank competition, loan spread and firm fixed effects

This table tests the effect of local bank competition on loan spread by controlling firm fixed effects. Credit rating information is from S&P long-term debt rating. The details of variable definitions and measurements are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Heteroskedasticity-robust t-statistics are reported in parentheses. Standard errors are clustered at package level. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Loan Spread
Deposit Herfindal Index MSA	77.02*
	(1.89)
Log Total assets	9.810***
	(2.98)
Leverage	-11.28
	(-0.99)
Z Score	3.389
	(1.05)
Return on Assets	-94.77***
	(-3.14)
Market-to-Book	-1.955
	(-1.19)
Log Loan Size	-11.88***
	(-8.42)
Log Loan Maturity	2.739*
	(1.67)
Performance Pricing	-30.47***
	(-11.58)
Secured Loan Dummy	39.97***
	(9.46)
Missing Security Information	-5.710**
	(-2.13)
Loan Purpose: Merger	23.19***
	(7.05)
Loan Purpose: Debt Repay	1.059
	(0.29)
Term Loan Indicator	43.46***
	(16.14)
Constant	295.9***
	(8.32)
Rating FE	Yes
Firm FE	Yes
Year FE	Yes
Observations	9840
Adjusted R^2	0.713

Table 1.13: Local bank competition, loan covenants and poisson regression

This table tests the effect of local bank competition on loan covenants under poisson regression. Credit rating information is from S&P long-term debt rating. Covenant control includes debt to total net worth, current ratio, fixed charge ratio, log total net worth. The details of variable definitions and measurements are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Number of All Covenants	(2) Number of Financial Covenants	(3) Number of General Covenants
main			
Deposit Herfindal Index MSA	0.736***	0.381	1.009***
	(3.12)	(1.44)	(3.72)
Log Total assets	-0.0969***	-0.0738***	-0.0926***
	(-6.40)	(-5.13)	(-4.98)
Leverage	0.144**	0.222***	0.139*
	(2.18)	(3.28)	(1.78)
Z Score	0.00306	0.0205**	-0.0000439
	(0.29)	(2.20)	(-0.00)
Return on Assets	-0.0988	-0.110	-0.0781
	(-0.69)	(-0.69)	(-0.46)
Market-to-Book	-0.0195	-0.0174	-0.0304**
	(-1.43)	(-1.21)	(-2.17)
Log Loan Size	0.0845***	-0.0227**	0.145***
	(7.93)	(-2.16)	(11.24)
Log Loan Maturity	0.0190	0.0481***	-0.00503
	(1.42)	(3.79)	(-0.31)
Performance Pricing	0.140***	0.106***	-0.0389
	(6.20)	(4.78)	(-1.53)
Secured Loan Dummy	0.291***	0.143***	0.410***
	(12.35)	(6.81)	(13.58)
Missing Security Information	-0.00906	0.0237	0.0484
	(-0.39)	(1.19)	(1.62)
Loan Purpose: Merger	0.230***	0.0941***	0.294***
	(10.48)	(4.44)	(10.75)
Loan Purpose: Debt Repay	0.128***	0.0634***	0.101***
	(6.03)	(3.07)	(3.81)
Constant	1.668***	1.284***	1.434***
	(7.43)	(5.58)	(5.99)
Covenant Control	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes
Observations	3528	3130	3465
Adjusted R^2			

Table 1.14: Local bank competition, loan spread and local supply

The table represents regression of loan spread on deposit Herfindahl Index, total deposit at MSA, firm characteristics, loan characteristics, rating dummies, year, industry and geographical fixed effects. The dependent variable is all-in-drawn loan spread. Deposit Herfindahl Index is deposit concentration at MSA level. The details of variable definitions and measurements of all other variables are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Standard errors are clustered at package level as well. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1) Loan Spread
Deposit Herfindal Index MSA	149.3***
	(2.99)
Total Deposit MSA	-16.80
	(-1.45)
Log Total assets	6.765***
	(4.42)
Leverage	14.58*
	(1.70)
Z Score	0.831
	(0.45)
Return on Assets	-23.01
	(-1.00)
Market-to-Book	-4.617***
	(-3.42)
Log Loan Size	-11.75***
	(-8.68)
Log Loan Maturity	0.550
	(0.31)
Performance Pricing	-31.95***
	(-12.98)
Secured Loan Dummy	48.19***
	(12.34)
Missing Security Information	-8.776***
	(-3.43)
Loan Purpose: Merger	20.49***
	(6.20)
Loan Purpose: Debt Repay	-1.504
	(-0.44)
Term Loan Indicator	47.83***
	(17.40)
Constant	597.2***
	(3.13)
Rating FE	Yes
Industry FE	Yes
Year FE	Yes
MSA FE	Yes
Observations	9802
Adjusted R^2	0.649

Table 1.15: Local bank competition, loan covenants and local supply

This table includes regressions of number of all covenants, number of general covenants, number of financial covenants, and loan strictness. Total deposit at MSA is measured by aggregated deposits at each MSA. Covenant control includes debt to total net worth, current ratio, fixed charge ratio, log total net worth. The details of variable definitions and measurements are reported in the appendix. All regressions are OLS. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Number of All Covenants	(2) Number of Financial Covenants	(3) Number of General Covenants	(4) Loan Strictness
Deposit Herfindal Index MSA	4.669***	1.621**	3.202***	0.117
	(3.00)	(2.21)	(2.83)	(0.66)
Total Deposit MSA	-0.400	-0.244*	-0.102	0.0311
	(-1.28)	(-1.65)	(-0.44)	(0.81)
Log Total assets	-0.454***	-0.169***	-0.245***	-0.0167*
	(-6.26)	(-4.82)	(-4.56)	(-1.70)
Leverage	0.808**	0.610***	0.402	0.315***
	(2.24)	(3.44)	(1.61)	(7.16)
Z Score	0.0418	0.0525**	0.0192	-0.0120*
	(0.75)	(2.15)	(0.44)	(-1.67)
Return on Assets	-0.187	-0.241	0.00590	-0.208**
	(-0.25)	(-0.59)	(0.01)	(-2.25)
Market-to-Book	-0.104*	-0.0395	-0.0908**	-0.0175***
	(-1.67)	(-1.17)	(-2.40)	(-3.07)
Log Loan Size	0.382***	-0.0505**	0.378***	0.00362
	(7.64)	(-2.00)	(10.48)	(0.54)
Log Loan Maturity	0.114**	0.0999***	0.0295	0.00342
	(1.99)	(3.69)	(0.71)	(0.45)
Performance Pricing	0.687***	0.256***	-0.0886	0.0533***
	(6.45)	(4.91)	(-1.15)	(3.95)
Secured Loan Dummy	1.430***	0.332***	1.108***	0.0342**
	(12.51)	(6.50)	(13.32)	(2.58)
Missing Security Information	-0.0385	0.0313	0.0967	0.0124
	(-0.43)	(0.75)	(1.54)	(1.05)
Loan Purpose: Merger	1.244***	0.230***	0.964***	0.0627***
	(10.13)	(4.26)	(10.36)	(4.14)
Loan Purpose: Debt Repay	0.611***	0.163***	0.248***	0.0389***
	(5.51)	(2.95)	(3.17)	(2.92)
Constant	11.85**	6.808***	4.482	-0.0922
	(2.35)	(2.94)	(1.20)	(-0.15)
Covenant Control	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	3528	3130	3465	1825
Adjusted R^2	0.468	0.435	0.423	0.335

Chapter 2

Creditor Control Rights, Corporate Governance and Bond Performance

2.1 Introduction

This chapter tests the hypothesis that bondholders benefit from a bank's influence over firm corporate governance when a loan covenant is violated. Traditionally, corporate creditors are considered as passive bystanders until firms are in default. In fact, a bank influences a firm well before bankruptcy. When a firm breaches a financial covenant, technical default triggers and control rights shift to the creditor. Banks can use the threat of accelerating an existing bank loan to choose the desired course of action. As Shleifer and Vishny (1997) argue, "Significant creditors, such as banks, are also large and potentially active investors. ... Their power comes in part because of a variety of control rights they receive when firms default or violate debt covenants. ... As a result of having a whole range of controls, large creditors combine substantial cash flow rights with the ability to interfere in the major decisions of the firm.". As defined in Nini et al. (2011), the "mixed region" of corporate governance is when firm performance deteriorates but before payment defaults. In "mixed region," actions of both creditors and stockholders are important to firm corporate governance.

The chapter focuses on loan covenant violation for two reasons. First, creditors receive control rights when a loan covenant is violated. Via control rights, creditors influence managerial decisions, providing a suitable setting for bank influence studies. Second, contrary to default payment, loan covenant violation is common. As described in Nini et al. (2011), between 10 and 20 percent of public firms violate covenants each year, making empirical analysis of bank influence possible.

The bank has influence over a firm's decision in two ways: contractual control and non-contractual control. Contractual control comes directly from loan agreements. Creditors can choose immediate repayment of principal and terminate lending commitments after covenant violation, providing creditors a strong bargaining power in negotiations following a violation. After covenant violation, creditors may renegotiate with the violator about price and non-price loan terms. Through the process of renegotiation, creditors influence the firm to choose the desired course of action. Creditors can also use non-contractual control. For example, creditors advise on how to manage performance problems that caused covenant violation or demands better reporting and liquidity management. As Triantis and Daniels (1995) write, the voice of creditors ranges from advice and exhortation to exclusive control over the firm's decisions.

Prior literature show that bank influences over covenant violators to cut investment, to reduce net debt issuance and even to fire underperforming CEOs (Chava and Roberts (2008), Roberts and Sufi (2009), Nini et al. (2011), Ozelge and Saunders (2011)). Unlike public bonds, bank debt is tightly held, even for large syndicated loans. Therefore, renegotiation costs are lower for banks than for bondholders, making bank influence possible after covenant violation. When a firm violates loan covenant, banks possess the power over the corporation and has a chance to influence firm corporate governance. Therefore, passive public bondholders may benefit from active bank influence, though financial covenant violation itself is a negative news.

To better understand bank's influence over firm corporate governance, consider the case of Magellan Health Services, Inc. (Figure 2.1), once the nation's largest managed behavioral health company. On November 1, 2002, Magellan Health Services obtained from bank lenders a interim waiver of its financial covenants through December 31, 2002. Without the reprieve, bank

lenders could have demanded an accelerated repayment schedule, potentially pushing the firm into bankruptcy. On the same day, Daniel S. Messina, CEO of the company, was forced to resign the position. According to the news from the Washington Post on November 2, 2002,"Daniel S. Messina's decision to step down came as Magellan's banks granted a temporary reprieve, assuring that the company won't go into technical default on its $300 million in bank debt at least until December 31 (2002)." From historical bond trading prices, the last average net trading price on September 12, 2002, before the news announcement was 84.3% of face value, while the first average net trading price on December 31, 2002, after the news announcement was 97.8%. The price increases about 16% around this event. Interestingly, Moody's bond rating dropped from B3 to Caa2 during the period.

I find that average abnormal bond return is 2.31% surrounding loan covenant violation and cumulative abnormal bond return is 9.1% 12 months after a covenant violation and 16.26% 24 months after a covenant violation. The finding of bond performance improvement is consistent with the evidence of operating performance and stock returns improvements (e.g. Nini et al. (2011)). Bank influences firm corporate governance and future firm performance.

I use outstanding loan balance as a proxy of bank's incentive to influence. A higher outstanding loan balance, a bigger loss bank may have if it doesn't involve in managerial decisions. Outstanding loan balance is also significantly correlated with future loan amendment probability. I find cross-section abnormal bond returns is positively related to bank's incentive to influence after controlling firm and bond characteristics. I also find a positive relation between bank's incentive to influence and stock performance. The evidence shows that both stockholders and bondholders enjoy the benefits from subsequent corporate governance improvement. I reinvestigate the relation between bank's incentive to influence and forced CEO turnover, a potential channel bank disciplines the poorly performing CEO. I find that probability of forced CEO turnover is positively related to bank influence incentive, while I don't find a significant relation between overall CEO turnover and bank influence incentive, which shows that large creditors influence board's decision on firing a poor CEO. Moreover, long-term abnormal bond return is positively related to forced

CEO turnover. Finally, firms with positive change of bank directors have higher abnormal bond return than those with negative change of bank directors.

The chapter contributes to bank's influence over firm corporate governance literature. Bank monitoring reduces agency cost between creditor and manager. Then, passive bondholders will benefit from bank monitoring. The cross benefit from bank monitoring to bondholders is addressed by Datta et al. (1999). By investigating the bond yield of bond IPO firms with and without bank loans, Datta et al. (1999) find that bond yield is lower for firms with bank monitoring. Ivashina et al. (2008) investigate the role of banks as governance agents in the takeover market. When a firm has bank debt outstanding, it has a greater likelihood of becoming a takeover target. Ozelge and Saunders (2011) show banks exercise governance role through the replacement of underperforming CEOs in borrowing firm. The effect of lending banks in forcing CEO turnover is explained in large part by covenant violations. Nini et al. (2011) find that violations are followed by conservative investment and financing activities and forced CEO turnover. They also show that firm operating and stock performance improve following loan covenant violation. This chapter focuses on bank corporate governance and its effect on bond performance after loan covenant violation. Both short-term and long-term abnormal bond returns increase. In addition, cross-section abnormal bond return and stock return is positively related to bank influence incentive. The evidence shows that bank influence after covenant violation creates value for both shareholders and bondholders. The chapter also contributes to studies on corporate governance mechanism and bond price. These mechanisms include top management incentives, blockholder monitoring, anti-takeover law and provisions, and bank monitoring. Ortiz-Molina (2006) show bondholders require high bond yield by anticipating the future risk choices contained in managerial incentive structures. For corporate control market, leverage increasing takeovers expropriate target firm bondholders' wealth. Therefore, empirical findings show that bond yield is low for firms with anti-takeover provisions, such as classified board (Chen (2011)), or firms in anti-takeover hostile states (Qiu and Yu (2009), Francis et al. (2010)), or firms locating in good creditor protection law states, such as payout restriction law (Mansi et al. (2009)). Cremers et al. (2007) show the impact of interaction of shareholder con-

trol and takeover vulnerability on bondholders. Blockholders align shareholders and management but might facilitate takeover. Datta et al. (1999) show that the cross monitoring role of bank debt lowers the bond yield spread for public bond offers by 68 basis points on average. Complementary to Datta et al. (1999), this chapter shows that bank debt is another important corporate governance mechanism that affects bond price. I provide two governance channels for bank influence. One is forced CEO turnover, the other is bank directors on board. I show that forced CEO turnover is positively related to bank influence incentive. Further, forced CEO turnover is positively associated with high long-term bond performance. Additionally, firms with increasing bank directors have higher abnormal bond returns than those with decreasing bankers on board subsequently.

In Section 2.2, I discuss the data, variables and summary statistics. In Section 2.3, I show the empirical findings, including event studies, cross-section effect of bank influence on bond performance, the relation between bank influence and CEO turnover. I also discuss the alternative explanation and robustness of the main results. Section 2.4 provides concluding remarks.

2.2 Data, Variables and Summary Statistics

2.2.1 Sample

I obtain the loan violation data from Amir Sufi's website. The data are described in the appendix of Nini et al. (2011).[1] Construction of the covenant violation data begins with data for all nonfinancial U.S. firms in Compustat with book assets greater than $10 million in 2000 dollars. Nini et al. (2011) use a text-search algorithm that first locates word "covenant" in firm EDGAR filings, then conditional on finding the word "covenant," they search five terms: "waiv," "viol," "in default," "modif" and "not in compliance." Based on a test dataset, they find 94 out of 105 violations can be identified based on the algorithm.

Bond characteristics and bond price data are collected from Mergent FISD and NAIC Databases,

[1]Data can be found at http://faculty.chicagobooth.edu/amir.sufi/data.htm. I thank Professor Sufi for sharing the data. The data doesn't include violations of non-financial covenants, such as limits on capital expenditure or acquisitions. For details, please refer to the data appendix in Nini et al. (2011).

respectively. NAIC bond data include all purchases and sales of public fixed income securities by insurance companies that are required to report all their bond trades to National Association of Insurance Commissioners (NAIC). The data cover only the insurance companies bond transactions. However, insurance companies hold about one third of all public corporate bond issues and account for a quarter of all high yield bond transactions (Campbell and Taksler (2003) and Hong and Warga (2000)). Therefore, prior to implementation of TRACE, NAIC Dataset is a reasonable data source for bond studies.

Bank loan data come from LPC Dealscan database. Dealscan contains detailed loan information, such as loan start date and end date, maturity, loan size, and loan type. I construct loan balance based on the loan origination data and ending date, loan type and loan size. Dealscan data come from both firm filings and bank reports and it has a reasonable coverage of historical bank loans. According to Carey and Nini (2007), Dealscan has information on 50-70% of all U.S. commercial loan volume into the early 1990s, with coverage increasing to 80-90% from 1992-2002. I am able to match Compustat and Dealscan using the Compustat-Dealscan link made publicly available by Michael Roberts and Wharton Research and Data Services (Chava and Roberts (2008)).

Since loan covenant violation data are collected from 10-K and 10-Q, the covenant violation announcement coincides with the earnings announcement. According to Datta and Dhillion (1993) and Easton et al. (2009), bond markets react to earnings announcements. Thus, I calculate earnings surprise from I/B/E/S and control earnings surprise when analyzing bond returns.

To control institutional investor monitoring, I merge the data with institutional holding from Thomson Financial. All accounting information comes from Compustat quarterly data and all stock return information comes from the CRSP tapes. In cross-section regressions, I drop observations with missing accounting information. CEO turnover date, director and CEO information, insider ownership are collected directly from SEC proxy filings. News surrounding CEO turnover date are collected from Factiva.

2.2.2 Variables

Abnormal Bond Return

Following Bessembinder et al. (2009), I use daily volume-weighted bond price and accrued interests to calculate bond return.

$$\text{Bond Return} = \frac{P_{t+1} - P_t + \text{Accrued Interests}}{P_t} \tag{2.1}$$

For short-term bond return, I use the last trading price before a violation announcement and first trading price after a violation announcement to calculate the price changes. I require that the last trading price before announcement is within a three-month pre-announcement window and the first trading price after announcement is within a three-month post-announcement window. Since bond trading is less active than equity trading, the average time lag between the two trading prices is 52 days. For long-term bond return, I use the last trading price close to a 12-month end to calculate a 12-month bond return and last trading price close to a 24-month end to calculate a 24-month bond return. Figure 2.2 shows the timeline how I calculate the short-term and long-term abnormal bond returns.

Then, I estimate abnormal bond returns by subtracting bond raw return by a matched portfolio return, which is proxied by the Lehman Brothers Corporate Index return. The Lehman Brothers Corporate Indices are renamed to Barclays Capital Bond Indices after Lehman Brothers went bankrupt in 2008. Based on the report on Barclays Capital Indices [2], bonds in the index are priced on the bid side. Coupons are adjusted in the index as well. By matching the credit ratings and maturity of bond indices, I control default risk and time-to-maturity, two primary bond risk factors. This approach to calculate abnormal bond return is similar to the approach in Cai et al. (2007), Bessembinder et al. (2009) and Kedia and Zhou (2009).

[2]The Benchmark in Fixed Income: Barclays Capital Indeces, December 2008.

Bank's Incentive to Influence

One-third of firms renegotiate with banks on existing bank loans. In the appendix, I show that renegotiated loans are smaller, have a higher loan spread and a shorter maturity. For non-price terms, they are less likely to have performance pricing provision, are more likely to have sweep provisions, and have a smaller lending group in general. By nature, a valid proxy of bank influence incentive should have some predictive power of future loan amendment probabilities, though banks can influence firms via both contractual control and non-contractual control.

A good proxy for a bank's incentive to influence is the outstanding loan balance. First, a higher outstanding loan balance in a firm, a higher effort bank would like to improve firm governance so as to avoid a loss. Outstanding loan balance is a very natural variable to measure bank influence incentive. Second, outstanding loan balance is significantly correlated to future loan amendment probability, a potential channel for creditors to influence firm decisions. Table 2.1 shows that outstanding loan balance is positively associated with future loan amendment probability [3], supporting outstanding loan balance is a valid proxy for bank's incentive to influence firm decisions. [4] The bank loan balance is calculated via the loan information from the Dealscan database. For term loans, I use linear interpolation to get the loan balance over time. For lines of credit, I assume 50% utilization of the credit line. For example, a firm borrows a $5 million 5-year term loan and $2 million 3-year lines of credit in 2000. The principle of term loan reduces 20% every year. Thus, the term loan balance in 2002 is $3 million. I assume 50% utilization of lines of credit. Therefore, the lines of credit balance in 2002 is $1 million. The total outstanding loan balance for the firm is $4 million in 2002. [5]

[3] Amended loans are required to be loans within 6 months after a covenant violation

[4] Another proxy I use is the loan percentage, which is the loan balance scaled by firm total assets or by firm total liability. Additional analysis is attached in the appendix.

[5] The main results of the chapter are robust to different assumptions on unitization of lines of credit and interpolation of term loan principle. Please refer to section 2.3.5 for details.

Forced CEO Turnover

I collect CEO turnover information from SEC proxy filings, such as CEO age, CEO name, and turnover date. Following Parrino (1997), I classify turnover into forced and voluntary. All departures for which the press reports the CEO as fired, forced out, or retires or resigns due to policy differences or pressure are classified as forced. All other departures for CEOs above and including age 60 are classified as voluntary. Departures for CEOs below age 60 are investigated further. If the press did not report their departures as death, poor health, or the acceptance of another position, or report CEO's retiring within six months before the succession, I classify the turnover as forced. All other remaining turnover are consider as voluntary.

Because I keep tracing each firm 2 years following violation announcement, it is possible that some firms get merged or bankrupt subsequently. For CEO turnover due to takeover and bankruptcy, I follow the method adopted by Lehn and Zhao (2006). If the target CEO does not get a new position in the merged company, I consider the turnover as forced. If a firm doesn't emerge from bankruptcy or a firm emerges from bankruptcy but the CEO is replaced, I consider the CEO turnover as forced. The sample has 22 firms bankrupt and 24 firms merged within 2 years following covenant violation.

In addition, I consider all CEO turnover in firms exit due to mergers and acquisitions as voluntary turnover. Because most of the time, it is unlikely that creditors influence the CEO to leave in a merged firm. I provide an additional test of CEO turnover in this case.

2.2.3 Summary Statistics

The final sample contains 471 bonds and 297 firms in the event window, which is about 1.6 bonds per firm. Table 2.2 shows the bond, firm and board characteristics. Event and 24-month raw bond returns are 0.29% and 18.99%, respectively. Adjusted by matched bond index returns, the event and 24-month abnormal bond returns are 1.71% and 17.36%, respectively. The average bond maturity is 100 months, which is about 8 years. The average offering amount is $363 million.

The average leverage ratio is 50%, market to book is 1.26, and ROA is 8.6%. [6] Firm characteristics are poorer in the sample than those in the entire Compustat dataset, since my sample only includes firms with loan covenant violations. Standardized earnings surprise is -1.3%, which shows the unexpected news are negative in general for violators. The average holding of blockholder is 24.84%, and there are 2.7 blockholders on average for a firm.

Average insider ownership is 12.8%, which is the aggregate ownership of executives and directors on board from proxy filings. The average board size is 9.2. I categorize the directors into insiders, grey directors and outsiders. The number of outsiders on board is 6.3 on average. Percentage of outsiders is a measurement of board independence. On average, 15.5% of firms have at least one bank director on board. 62.7% of firms have CEOs with the chairman title. The average age for a CEO is 54 years old.

Overall CEO turnover 2 years following covenant violation is 45.5%, while the forced CEO turnover is 28.6%. I also report the annual turnover ratios. The forced CEO turnover is 11.4%, 9.8%, 7.4% for event year, first year and second year after announcement, respectively.

Table 2.3 reports bond rating and bond provisions. The sample contains 125 investment grade bonds and 352 junk bonds. Bonds with callable provisions are 417, with credit enhancement are 100, and with putable provision are 22. Bonds which were placed under rule 144a are 48. I control these bond characteristics in multivariate analysis.

2.3 Empirical Findings

2.3.1 Event Study

Table 2.4 reports the abnormal bond returns in short-term and long-term windows. Covenant violation by itself is negative news in the market. But combined the positive effect of bank influence to improve future firm performance, bond market reaction to covenant violation might be positive. I show the time series average abnormal bond return from one year before covenant vio-

[6] I roll the quarterly Compustat data to get annual ROA.

lation to two years after covenant violation in figure 2.3. Abnormal bond return is value-weighted across all bonds in the sample. Zero in time line is the year when a firm violates a loan covenant. The graph shows abnormal bond returns increase dramatically after loan covenant violations.

In Table 2.4, abnormal bond return around the announcement of covenant violation is about 1.71%, and 12-month and 24-month average abnormal bond returns following the announcement are 9.1% and 17.36%, respectively. [7] Both mean and median are significantly different from zero. I also measure value-weighted firm level abnormal bond return. Firm level abnormal bond returns are different from zero statistically. Because the gap between two trading prices in short term is 52 days on average, the bond event window is longer than a typical stock event window. I also calculate bond CAR from daily bond quote data. Due to data coverage difference, I find 96 bonds with covenant violations from the daily quote data. Three-day bond CAR[0,2] is 0.376%, and bond CAR[-1,1] is 0.569%. Both bond CARs are significant statistically. Three-day event window in Table 2.5 shows the abnormal bond return is positive and significant statistically. Bond investors consider bank influence a positive signal for future firm performance.

2.3.2 Bank's Incentive to Influence and Bond Performance

I test the cross-section variation of bond performance and its relation to bank's incentive to influence, measured by outstanding loan balances. Since the announcement of covenant violations coincides with earnings announcements, I use standardized earnings surprise to control the unexpected surprise in the capital market. Table 2.6 reports the regression results of a bank's incentive to influence the event and 24-month abnormal bond returns. The number of bonds in cross-section regression is slightly smaller than the number in event studies, because I drop the observations with missing firm characteristics. Cross sectionally, a higher bank influence incentive correlates with higher short-term and long-term abnormal bond returns.

In order to disentangle bank influence effects from shareholders' monitoring effects, I control

[7] Number of bonds in short-term event window is smaller than 12-month window, because trading prices observed 3 months after a violation are discarded.

blockholder ownership and number of blockholders for each firm. The coefficients of bank's incentive to influence are robust in both event and long-term analysis after controlling the monitoring effect of institutional investors. From specification (3) and specification (6), one standard deviation increase in loan balance (1.3) corresponds to a 1.78% increase in short-term abnormal bond returns (1.3*1.37%) and to a 6.94% increase in long-term abnormal bond returns (1.3*5.34%). The results show that bonds react more positively for firms with higher outstanding loan balance. In the short term, bondholders expect that bank with high influence incentive is likely to influence firm corporate governance subsequently and thus reacts positively. In the long term, firms with high bank influence incentive improve corporate governance more than firms with low bank influence incentive. Thus, long-term abnormal bond return is positively related to a bank's incentive to influence.

2.3.3 Bank's Incentive to Influence, Forced CEO Turnover and Bankers on Board

This section provides some evidence to show how bank influences firm corporate governance and the cross-section implication of bank influence over bond returns. Table 2.7 shows that the probability of forced CEO turnover is positively related to bank influence incentive. For an average outstanding loan balance, one percentage increase in average loan balance is related to a 7.26% increase in forced CEO turnover probability in specification (1). Prior literature shows institutional investors influence board decisions on CEO turnover. Besides controlling firm and board characteristics, I include the equity governance variables, such as blockholder ownership and number of blockholders, to separate the bank influence effects from shareholder monitoring effects on CEO turnover. From specification (2) and (4), we know that bank corporate governance is significantly related to forced CEO turnover, but not to overall CEO turnover, which includes voluntary departures. The results show that creditors are influential to board decisions on forced CEO turnovers.

I find similar CEO turnover results when I consider CEO turnover in firms with mergers and ac-

quisitions as voluntary leave. Table 2.8 shows the results. Bank influence variable is significant for forced CEO turnover in all specifications, but insignificant for overall CEO turnover regressions.

Next, I show that long-term abnormal bond return is positively related to forced CEO turnover, while the relation between long-term abnormal bond return and overall CEO turnover is weak and not statistically significant. I include the forced and overall CEO turnover dummies in the long-term abnormal bond return regression. As shown in Table 2.9, forced CEO turnover is positively related to abnormal bond return, while the overall CEO turnover, including voluntary CEO departure, is not significantly related to long-term abnormal bond returns. The evidence shows that bonds react positively for those firms disciplining poor CEOs.

Another channel for bank corporate governance is bankers on board. The sample has 15% firms with bank directors. One third of bankers have a direct lending relationship with the violator [8]. Bank directors either provide advisory to the company or monitor a CEO's decisions. I keep tracing SEC proxy filings two years following covenant violation and check the changes of bank directors on board. I find that firms with decreasing bank directors experience 9.86% long-term abnormal bond return in Table 2.10, while firms with increasing bank directors have a long-term abnormal bond return 22.95% [9]. The difference is statistically significant.

2.3.4 Discussion and Alternative Explanation

The event studies show that short-term abnormal bond return is positive, while existing evidence shows that short-term abnormal stock return is negative (such as Nini et al. (2011) and Beneish and Press (1995)). Nini et al. (2011) argue that the negative abnormal stock return suggests that investors do not immediately incorporate the future performance improvements into stock price. Due to limits of arbitrage, sell-side pressure from investors who have to reduce holdings following a violation may swamp any positions from buyers who would put upward pressure on prices. The short-term negative equity reaction to covenant violation concentrates several days

[8] I identify the lending relationship by matching Dealscan bank names and company names of bank directors.

[9] Part of the reason for a decrease in the number of bank directors is that the director retires from a commercial bank.

around the announcement date. Nini et al. (2011) mention that the negative short-term abnormal stock return could be driven by prior returns before covenant violation. Nini et al. (2011) use monthly regression to estimate the one-month abnormal stock return. From the sample, I find the announcement date has a median 16 days to month end. Using monthly returns to estimate the first month abnormal stock return might capture both pre-announcement and post-announcement abnormal returns on average, making the one-month abnormal return negative. I recalculate the one-month abnormal stock return 22 trading days after the announcement date by daily stock returns. As shown in 2.11, the CAR(0,21) is positive on average in one month, while CAR(-10,11) is negative on average. Therefore, one-month stock returns after covenant violation is positive on average. The negative cumulative stock returns reverse within a month. Long-term cumulative abnormal stock returns are positive and significant, which is consistent to the findings in Nini et al. (2011).[10]

An alternative explanation for the coexistence of negative stock returns and positive bond returns is creditors transfer wealth from shareholders. If wealth transfer story is true, we would expect that banks with higher incentives to influence transfer more wealth from shareholders. Therefore, higher bank influence incentive predicts more negative stock returns. I calculate both event and long-term cumulative abnormal stock returns and investigate the cross-section relation between bank influence incentive and cumulative abnormal stock returns. In Table 2.12, I show that cumulative abnormal stock returns is positively related to bank influence incentive, which contradicts the wealth transfer story. The results show that firms with high bank influence incentive have less negative stock returns in the short-term and have more positive returns in the long-term. The positive relation between bank influence and cumulative abnormal returns of both stocks and bonds suggests that following bank influence creates value for both bondholders and shareholders.

[10]Stock return is delisting return adjusted.

2.3.5 Robustness Check

The key variable I use in the chapter is the outstanding loan balance, which is calculated under specific assumptions of term loan interpolation and lines of credit utilization. In the sensitivity analysis, I use different assumptions on how firms utilize revolver and term loans, e.g. 30% utilization of revolver, 70% utilization of revolver, and zero payment of term loan principal till maturity date. I use different combinations of previous assumptions and find that the main results are robust to different assumptions of utilization and repayment of bank loans.

The other concern when calculating outstanding loan balance is refinanced or renegotiated loans. Refinanced or renegotiated loans are replaced for previous loans. Including all loans may overestimate loan balance when some of the loans are replaced in this way. To alleviate the concern of double counting, I recalculate the loan balance using the past three-year bank loans only. For a short period of time, the bank loan is less likely to be refinanced. The coefficient of the new variable is similar to the one in the main result.

I also test the effect of bank influence incentive on firm-level abnormal bond returns. For each firm, I calculate value-weighted abnormal bond returns and run similar regressions in Table 2.6. Since the analysis is under firm level, I only control firm characteristics in each regression. Coefficient of bank influence incentive in firm-level analysis is similar to the one in bond-level analysis.

Besides outstanding loan balance, bankruptcy risk is another factor which can influence bank decisions. At the time of covenant violation, if bankruptcy risk is high, the expected loss increases. Banks have a large incentive to influence firm operations. To test whether bankruptcy risk is another proxy for bank influence incentive, I estimate the default probability under the Merton Model (Bharath and Shumway (2008)). The default probability or the expected value of loan balance under the default probability is not significantly correlated to the cross-section abnormal bond returns. The result is not a surprise. First, covenant violation is different from bankruptcy. Loan covenant violation triggers technical default and the violator is not close to the boundary of real default for most of the cases. Since the default risk is low, I do not find a significant

contribution of default probability on cross-section abnormal bond returns. Second, the default probability under the Merton Model doesn't include the bank's ex post efforts. A bank's ex post influence on a firm's decision affect the firm's operating efficiency and corporate governance, thus lowering the subsequent default risk.

Credit rating changes might affect the long-term abnormal bond return results. A two-year window is long enough for credit rating changes. Therefore, the positive long-term abnormal bond return following covenant violation might be driven by positive credit rating changes, but not the bank's incentive to influence. First, bank influence improves firm performance. Based on firm performance, the credit rating agency adjust the subsequent credit rating. Thus, credit rating improvement is a result of bank influence. Second, I test credit rating changes and bank influence incentives in long-term abnormal bond return regression in Table 2.13. Subsequent credit rating changes are not significantly related to long-term abnormal bond return, while outstanding loan balance is positively and significantly associated with long-term abnormal bond returns after controlling for credit rating changes. The effect of credit rating changes might be absorbed by bank influence effects or credit rating changes might not reflect the future bank influence over firm decisions.

In CEO turnover regression, I use accounting-based measurement to control past firm performance. In the robustness test, I use the past 12-month stock returns as a new proxy for firm performance. The coefficient of bank influence incentive on CEO turnover is robust to the new proxy.

2.4 Conclusion

The chapter shows the corporate governance role of bank debt and the positive effect of bank influence over bondholder value. I provide evidence that both short-term and long-term abnormal bond returns are improved significantly. I also show that the cross-section abnormal bond returns are positively related to the bank's incentive to influence. In addition, Bank influence incentive is

associated with forced CEO turnover which is correlated with better long-term bond performance. Firms with positive change of bank directors following a violation have better bond performance than firms with negative change of bank directors. Finally, I reinvestigate the results of abnormal stock returns after covenant violation and show that short-term and long-term abnormal stock returns are positively related to a bank's incentive to influence. The results indicate that banks influence firm corporate governance, which benefits both shareholders and bondholders.

Bank debt governance in this chapter is related to prior literature such as Nini et al. (2011), Ozelge and Saunders (2011), and Datta et al. (1999). The first outcome is that I provide the evidence of bond performance improvement after bank influence. The second coutcome is that I find that bond and stock returns are positively related to bank influence incentive from short-term and long-term evidence. Finally, I provide two governance channels, forced CEO turnover and bank directors, to address how banks improve corporate governance.

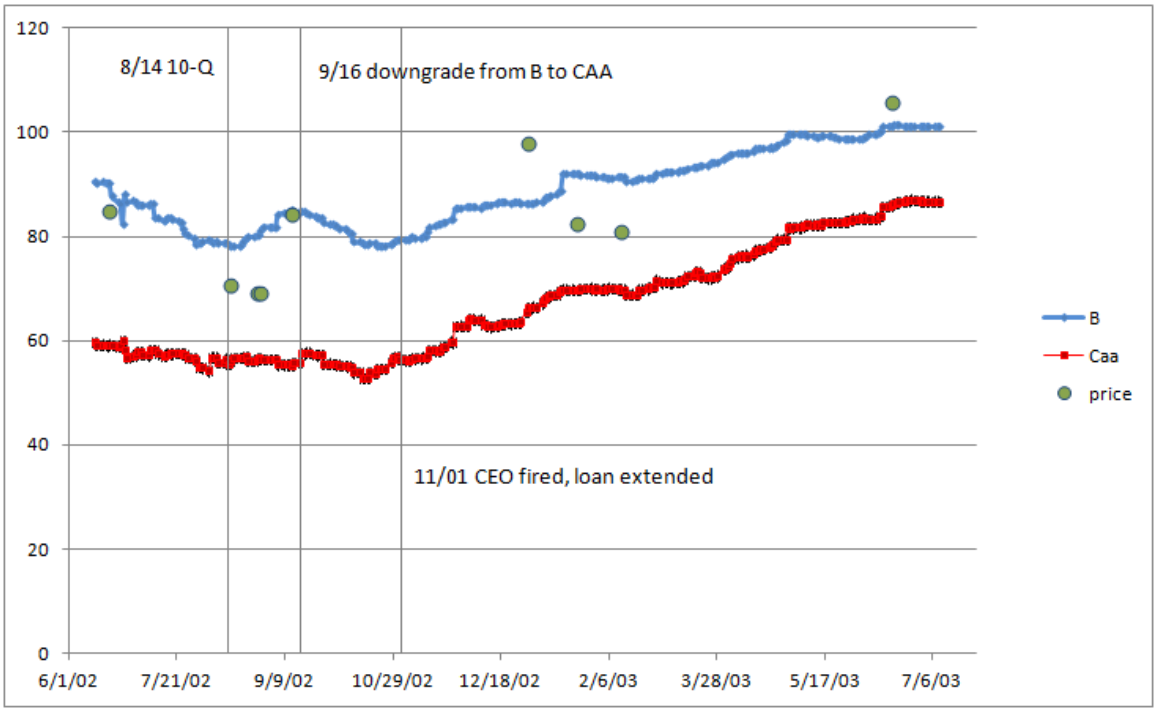

Figure 2.1: Magellan Health Service, Inc. bond trading prices
The 10-Q filing was released on August 14, 2002. Bond rating was downgraded from B to Caa on September 16, 2002. Banks of Magellan Health Service, Inc. gave a interim waiver of its financial covenants on November 1, 2002. CEO was forced to leave in the same day.

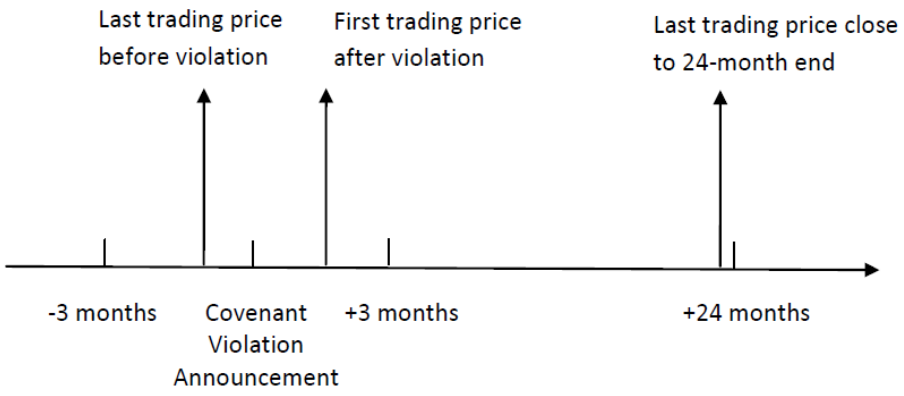

Figure 2.2: Time line for calculating bond returns
p_{t-1} is the last trading price before covenant violation, p_t is the first trading price after covenant violation, and p_{t+1} is the trading price closest to the second year end

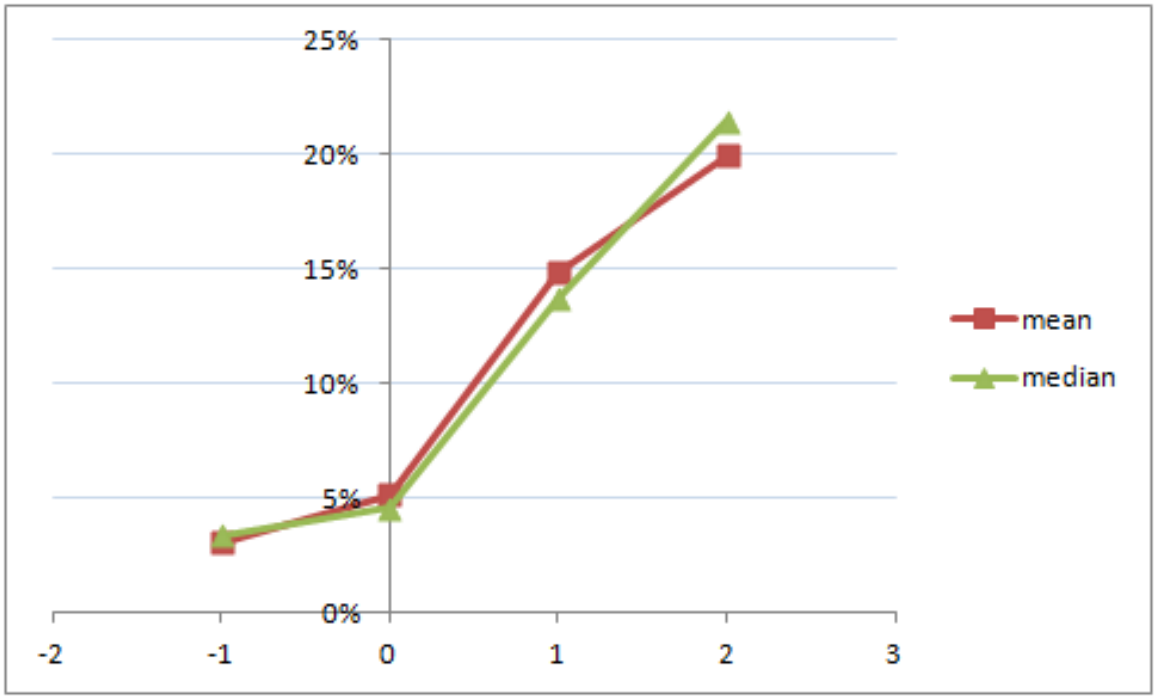

Figure 2.3: Cumulative abnormal bond returns
Cumulative bond returns start from one year before covenant violation to two years after covenant violation. Time 0 is covenant violation event time.

Table 2.1: Outstanding loan balance and loan amendment probability

The table presents the probit regression of loan amendment probability on outstanding loan balance. Loan amendment is identified as a loan is amended within 6 months after covenant violation. Loan variable is the natural logarithm of outstanding loan balance. Definitions of other variables are available in Appendix. Z-statistics are heteroskedasticity-robust. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1) amendment	(2) amendment
loan	0.316***	0.350***
	(2.79)	(2.83)
logat	-0.309***	-0.328***
	(-2.89)	(-2.66)
lev	-0.458	-0.569
	(-1.21)	(-1.52)
mb	0.167	0.219
	(0.90)	(1.16)
roa	-0.956	-1.257
	(-0.87)	(-1.11)
chairman		0.222
		(0.93)
insider ownership		0.191
		(1.52)
board size		-0.366
		(-0.76)
outside		0.775
		(0.75)
CEO age		0.986
		(1.25)
d_bank		0.314
		(1.00)
_cons	-0.552	-4.810
	(-0.72)	(-1.48)
N	249	247
pseudo R-sq	0.041	0.069

Table 2.2: Summary Statistics
Panel A and B report bond characteristics, firm characteristics and board characteristics. Panel C reports two-year time series CEO overall turnover and forced turnover. Bond data come from Mergent Fixed Income Security Database, firm data come from Compustat, board and CEO turnover data are hand collected from proxy filings in EDGAR. I use the definition of forced CEO turnover from Parrino (1997).

Panel A: Bond Characteristics

Variable	N	Mean	Median	Std Dev	p25	p75
Abnormal return(event)	471	0.0171	0.0122	0.127	-0.0176	0.0488
Raw return(event)	471	0.0029	0.0081	0.127	-0.0188	0.0309
Index return(event)	471	-0.0142	-0.0035	0.0942	-0.0328	0.0151
Abnormal return(24 months)	456	0.1736	0.1809	0.3551	0.0701	0.3267
Raw return(24 months)	456	0.1899	0.1493	0.3637	0.0741	0.2744
Index return(24 months)	456	0.025	-0.0308	0.449	-0.1226	0.0862
Maturity (months)	471	102.03	79	86.33	52	111
offering amount(mm)	471	360.22	275	313.26	200	400

Panel B: Firm and board characteristics

Variable	N	Mean	Median	Std Dev	p25	p75
Firm characteristics:						
Leverage	282	0.499	0.479	0.225	0.343	0.619
Loan percentage	282	0.356	0.245	0.311	0.125	0.547
Outstanding loan balance (mm)	282	1015	458	1563	239	1083
Loan balance (log)	282	6.20	6.13	1.303	5.479	6.988
Assets (mm)	282	5481	1961	9217	832	5024
Return on assets	250	0.086	0.092	0.089	0.056	0.132
Market to book	281	1.26	1.12	0.59	0.95	1.36
Standardized earnings surprise	197	-0.0134	0	0.0569	-0.004	0.0031
Stock return (past 12 months)	258	0.063	-0.051	0.8856	-0.484	0.365
Blockholder	238	0.2484	0.206	0.302	0.125	0.308
Number of blockholder	238	2.71	2	1.71	1	3
Board characteristics:						
Board size	295	9.23	9	2.17	8	11
Outside	294	6.29	6	2.42	5	8
Banker on board	297	0.155	0	0.362	0	0
CEO/chairman	295	0.627	1	0.484	0	1
CEO age	295	54	54	7.49	49	59
Insider ownership	295	0.128	0.061	0.156	0.0282	0.1603

Panel C: CEO Turnover

Variable	N	Mean	Std Dev	Min	Max
turnover	297	0.455	0.499	0	1
year0	297	0.168	0.375	0	1
year1	297	0.162	0.369	0	1
year2	297	0.121	0.327	0	1
forced	297	0.286	0.453	0	1
year0	297	0.114	0.319	0	1
year1	297	0.098	0.297	0	1
year2	297	0.074	0.262	0	1

Table 2.3: Distribution of Bond Rating and Bond Provisions
Panel A reports the distribution of bonds with different payment priorities. Panel B reports the sample distribution of crediting ratings. Panel C reports distribution of bonds with different provisions. Data come from Mergent Fixed Income Security Database.

Panel A: Payment Hierarchy

Priority of claims	N
Secured	37
senior	333
Subordinate	1
Sub subordinate	97
Non	3
Total	471

Panel B: Credit Rating

Rating	N
AAA	1
AA	4
A	40
BAA	83
BA	107
B	153
CAA	51
CA,C,D	21
NR	11
Total	471

Panel C: Bond Provisions

Bond provisions	N
Credit enhancement	91
Rule 144A	55
Putable provision	11
callable provision	405

Table 2.4: Event study

The table presents abnormal bond returns surrounding violation announcement, 12 months and 24 months following covenant violation. Event abnormal return measures buy-and-hold abnormal bond return around violation announcement, while long-term abnormal return measures 12-month and 24-month buy-and-hold abnormal bond returns after violation. Firm level bond abnormal return is value-weighted abnormal bond returns for each firm.

	Mean	Z-statistics	Wilcoxon z stat	positive	Obs
Abnormal return(event)	0.0171	2.92	4.92	60.50%	471
Abnormal return(event, firm)	0.0228	2.72	3.77	61.40%	254
Abnormal return (12 months)	0.0910	7.40	11.50	79.62%	530
Abnormal return (12 months, firm)	0.1190	1.92	6.58	75.10%	257
Abnormal return(24 months)	0.1736	10.44	13.532	86.40%	456
Abnormal return(24 months, firm)	0.1383	5.34	8.26	82.50%	223

Table 2.5: Three-day Cumulative Abnormal Bond Return

This table uses Datastream bond quote data to construct daily bond returns. Bond return calculation follows equation 2.1. I subtract raw bond returns by matched bond index return to get the abnormal bond returns.

	CAR	t stat	Obs.
[-1,1]	0.596%	2.26	96
[0,2]	0.376%	1.70	96

Table 2.6: Bank influence incentive and bond performance

The table represents the regression results on the effect of bank influence on abnormal bond return. The dependent variable is event and 24-month abnormal bond return. Loan represents logarithm outstanding loan balance. The details of variable definitions and measurements of all other variables are reported in the Appendix. Coefficients of the credit ratings should be interpreted as incremental effects with respect to the Ba bonds. T-statistics are heteroskedasticity-robust and cluster by firm. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	CAR(event)	CAR(event)	CAR(event)	CAR(2 years)	CAR(2 years)	CAR(2 years)
loan	0.0110*	0.0144*	0.0137*	0.0511***	0.0393**	0.0534***
	(1.80)	(1.75)	(1.96)	(2.74)	(2.02)	(2.77)
SUE	-0.146		-0.0852	-0.123		-0.0670
	(-1.37)		(-1.43)	(-0.95)		(-0.50)
lev	-0.0452	-0.117*	-0.137***	-0.340	-0.449**	-0.324
	(-0.80)	(-1.95)	(-2.99)	(-1.19)	(-2.29)	(-1.56)
roa	-0.000544	-0.182*	-0.0579	-0.817**	-1.027***	-0.802*
	(-0.00)	(-1.84)	(-0.50)	(-2.05)	(-2.88)	(-1.79)
logat	-0.0184***	-0.0136	-0.0149*	-0.00563	-0.0490*	-0.0654**
	(-2.67)	(-1.60)	(-1.75)	(-0.42)	(-1.85)	(-2.19)
mb	-0.0285	-0.00174	-0.0282	0.0656	0.000878	0.0180
	(-1.34)	(-0.19)	(-1.64)	(1.19)	(0.01)	(0.32)
logm		-0.00717	-0.00486		0.0270	0.0273
		(-1.29)	(-0.86)		(1.28)	(1.55)
logs		-0.0157	0.000969		0.105**	0.128**
		(-0.92)	(0.07)		(2.07)	(2.52)
A and above		0.0306*	0.0238		-0.0614	-0.0505
		(1.71)	(1.29)		(-1.09)	(-0.96)
Baa		0.0120	0.0133		-0.0653	-0.0525
		(0.75)	(0.78)		(-1.42)	(-1.43)
B		0.0154	0.0159		-0.00328	-0.0836*
		(0.72)	(0.90)		(-0.06)	(-1.67)
Caa		0.0450	0.0375		0.111	0.00464
		(1.39)	(1.32)		(1.32)	(0.04)
C and below		0.186	0.256		0.185*	0.0322
		(1.08)	(1.15)		(1.81)	(0.49)
No rating		-0.0538	-0.0638*		-0.287**	-0.271*
		(-1.51)	(-1.72)		(-2.07)	(-1.68)
Secure or senior		-0.0273	-0.0591**		0.0944	0.0671
		(-0.99)	(-2.34)		(1.57)	(1.14)
enhancement		-0.0299	-0.0371**		-0.0865	-0.0521
		(-1.08)	(-2.08)		(-1.27)	(-0.84)
Rule144a		0.0140	0.00369		0.0232	0.0150
		(0.77)	(0.22)		(0.26)	(0.16)
callable		0.0249	-0.0106		-0.0564	-0.0672
		(1.10)	(-0.58)		(-0.82)	(-1.13)
putable		-0.0164	-0.0326		-0.183	-0.223*
		(-0.52)	(-0.87)		(-1.62)	(-1.95)
block			-0.00221			0.107
			(-0.03)			(0.32)
number of block			-0.00872			0.0761
			(-0.48)			(1.10)
_cons	0.174**	0.253***	0.271***	0.112	0.0754	-0.176
	(2.22)	(3.42)	(3.44)	(0.48)	(0.24)	(-0.59)
N	294	343	294	289	343	288
adj. R-sq	0.056	0.054	0.152	0.119	0.176	0.218

Table 2.7: Bank influence incentive and CEO turnover

The table shows the effect of bank influence on forced CEO turnover. Dependent variable for specification (1) and (3) is the forced CEO turnover. Dependent variable in specification (2) and (4) is the overall CEO turnover, including forced and voluntary CEO departures. Loan variable is the logarithm outstanding loan balance. The details of variable definitions and measurements of all other variables are reported in the Appendix. Heteroskedasticity-robust z-statistics for probit regression are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1)	(2)	(3)	(4)
	forced turnover	all turnover	forced turnover	all turnover
loan	0.178*	0.0792	0.228*	0.119
	(1.80)	(0.86)	(1.95)	(1.47)
lev	0.601	0.808**	0.869**	0.746*
	(1.63)	(2.26)	(2.12)	(1.89)
roa	-2.935***	-2.762**	-2.941***	-2.493**
	(-2.59)	(-2.41)	(-2.67)	(-2.14)
logat	-0.177*	-0.173*	-0.302***	-0.220**
	(-1.76)	(-1.76)	(-2.76)	(-2.22)
mb	0.131	0.0367	0.0804	0.0230
	(0.73)	(0.22)	(0.49)	(0.15)
chairman	0.0915	0.172	-0.0411	0.118
	(0.47)	(0.93)	(-0.19)	(0.58)
outside	1.075	0.0175	1.037	0.161
	(1.47)	(0.03)	(1.25)	(0.22)
d_bank	0.331	0.216	0.272	0.336
	(1.29)	(0.85)	(0.95)	(1.21)
CEO age	-1.527**	0.228	-1.624**	0.307
	(-2.23)	(0.37)	(-2.16)	(0.46)
Board size	0.0546	0.289	0.532	0.496
	(0.12)	(0.69)	(1.03)	(1.07)
Insider ownership	0.0886	-0.967	0.0574	-1.376*
	(0.13)	(-1.47)	(0.08)	(-1.89)
Block			-0.958	-2.488**
			(-0.79)	(-2.15)
Number of block			-0.0690	0.212
			(-0.25)	(0.82)
_cons	4.325	-1.330	4.528	-1.587
	(1.58)	(-0.53)	(1.52)	(-0.59)
N	247	247	209	209
pseudo R-sq	0.099	0.065	0.133	0.082

Table 2.8: Bank influence incentive and CEO turnover under non-merged cases

The table shows the effect of bank influence on forced CEO turnover. CEO turnover in firms with mergers and acquisitions are considered as voluntary leave. Dependent variable for specification (1) and (3) is the forced CEO turnover. Dependent variable in specification (2) and (4) is the overall CEO turnover, including forced and voluntary CEO departures. Loan variable is the logarithm outstanding loan balance. The details of variable definitions and measurements of all other variables are reported in the Appendix. Heteroskedasticity-robust z-statistics for probit regression are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Forced Turnover	(2) All Turnover	(3) Forced Turnover	(4) All Turnover
loan	0.149*	0.0801	0.205**	0.114
	(1.84)	(1.17)	(2.00)	(1.45)
lev	0.439	0.977***	0.696**	1.049**
	(1.42)	(2.71)	(2.19)	(2.30)
roa	-4.106***	-1.951*	-4.459***	-2.002
	(-3.17)	(-1.65)	(-3.22)	(-1.61)
logat	-0.0866	-0.124	-0.192*	-0.166*
	(-0.87)	(-1.39)	(-1.76)	(-1.67)
mb	0.188	-0.0733	0.125	-0.0307
	(0.95)	(-0.38)	(0.84)	(-0.19)
chairman	-0.0363	0.232	-0.178	0.162
	(-0.17)	(1.20)	(-0.74)	(0.76)
outside	0.644	-0.270	0.337	-0.130
	(0.82)	(-0.41)	(0.37)	(-0.17)
d_bank	0.169	0.0955	0.0450	0.133
	(0.67)	(0.39)	(0.16)	(0.51)
CEO age	-1.617**	0.00745	-1.745**	0.189
	(-2.18)	(0.01)	(-2.05)	(0.27)
Board size	0.522	0.372	1.336**	0.551
	(1.14)	(0.86)	(2.42)	(1.14)
Insider ownership	0.484	-0.856	0.760	-1.261*
	(0.67)	(-1.29)	(0.95)	(-1.69)
Block			0.280	-2.298*
			(0.23)	(-1.91)
Number of block			-0.275	0.130
			(-0.99)	(0.48)
Constant	1.492	-2.034	0.211	-3.201
	(0.45)	(-0.71)	(0.06)	(-1.05)
Observations	232	232	197	197
Pseudo R^2	0.124	0.071	0.166	0.093

Table 2.9: Bank influence, CEO turnover and long-term bond performance

The table represents the regression results on the effect of bank influence and CEO turnover on bond performance. The dependent variable is 24-month abnormal bond return. Loan is the logarithm outstanding loan balance. The details of variable definitions and measurements of all other variables are reported in the Appendix. Coefficients of the credit ratings should be interpreted as incremental effects with respect to the Ba bonds. T-statistics are heteroskedasticity-robust and cluster by firm. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1)	(2)	(3)	(4)
	CAR(2 years)	CAR(2 years)	CAR(2 years)	CAR(2 years)
loan	0.0493***	0.0436**	0.0554***	0.0493***
	(2.82)	(2.52)	(2.83)	(2.63)
forced turnover	0.217**	0.219***		
	(2.59)	(2.66)		
all turnover			0.103	0.110
			(1.39)	(1.60)
block		0.200		0.217
		(0.66)		(0.71)
number of block		0.0569		0.0546
		(0.93)		(0.85)
SUE	-0.00425	-0.00471	-0.0212	-0.0192
	(-0.03)	(-0.04)	(-0.15)	(-0.14)
lev	-0.372**	-0.319*	-0.397*	-0.345*
	(-2.05)	(-1.88)	(-1.89)	(-1.78)
ROA	-0.734*	-0.561	-0.933**	-0.759*
	(-1.98)	(-1.34)	(-2.37)	(-1.75)
logat	-0.0453*	-0.0433	-0.0653**	-0.0631**
	(-1.70)	(-1.59)	(-2.19)	(-2.09)
mb	-0.0195	-0.0108	-0.00209	0.00667
	(-0.37)	(-0.22)	(-0.04)	(0.13)
logm	0.0267	0.0266	0.0294*	0.0297*
	(1.61)	(1.58)	(1.76)	(1.75)
logs	0.111**	0.104**	0.120**	0.112**
	(2.59)	(2.46)	(2.56)	(2.41)
A and above	-0.124*	-0.122*	-0.129	-0.131
	(-1.79)	(-1.82)	(-1.33)	(-1.43)
Baa	-0.0352	-0.0428	-0.0354	-0.0437
	(-0.82)	(-1.13)	(-0.77)	(-1.09)
B	-0.0539	-0.0616	-0.0593	-0.0667
	(-0.97)	(-1.10)	(-1.07)	(-1.20)
Caa	0.0832	0.0106	0.0881	0.0149
	(0.84)	(0.11)	(0.89)	(0.15)
C and below	0.0316	-0.0115	0.0908	0.0477
	(0.41)	(-0.16)	(1.12)	(0.66)
No rating	-0.294**	-0.294**	-0.274*	-0.275*
	(-2.06)	(-2.08)	(-1.71)	(-1.72)
Secure or senior	0.0663	0.0733	0.0537	0.0601
	(1.16)	(1.27)	(0.89)	(0.99)
enhancement	-0.0126	-0.0220	-0.0444	-0.0546
	(-0.20)	(-0.36)	(-0.68)	(-0.86)
Rule144a	-0.0364	-0.0251	-0.0206	-0.0104
	(-0.49)	(-0.31)	(-0.26)	(-0.12)
callable	-0.0571	-0.0555	-0.0501	-0.0480
	(-1.14)	(-1.09)	(-0.99)	(-0.90)
putable	-0.182*	-0.207*	-0.217**	-0.244**
	(-1.74)	(-1.91)	(-2.05)	(-2.20)
_cons	-0.114	-0.203	-0.0173	-0.104
	(-0.41)	(-0.81)	(-0.05)	(-0.35)
N	288	288	288	288
adj. R-sq	0.260	0.276	0.217	0.233

Table 2.10: Changes of banker on board and abnormal bond return

The table shows the abnormal bond return for three types of firms: firms with decreasing bank directors, firms with increasing bank directors and firms with no change of bank directors.

	N	mean	median	Std
Decreasing bank directors	15	9.86%	10.67%	0.249
No change of bank directors	339	20.64%	17.88%	0.255
Increasing bank directors	18	22.95%	19.52%	0.187

Table 2.11: Stock abnormal returns

The table shows short-term and long-term abnormal stock returns. Using past one year daily stock returns, I estimate abnormal stock returns by four-factor model, including three factors from Fama and French (1993) and momentum factor. Stock return is delisting return adjusted.

Variables	CAR0	CAR(0,1)	CAR(-1,1)	CAR(-10,11)	CAR(0,21)	CAR(1 year)	CAR(2 years)
mean	-0.02%	-0.30%	-0.15%	-0.14%	0.50%	19.03%	44.20%
t-stat	-0.0551	-0.6451	-0.2861	0.1192	0.4932	3.0856	4.551
N	289	286	296	286	286	235	211

Table 2.12: Bank influence and abnormal stock returns

The table shows the relation between bank influence and cross-section abnormal stock returns. Abnormal stock returns is estimated by four-factor model, including three factors from Fama and French (1993) and momentum factor. Loan is the logarithm outstanding loan balance. The details of variable definitions and measurements of all other variables are reported in the Appendix. Heteroskedasticity-robust z-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	CAR0	CAR(0,1)	CAR(-1,1)	CAR(1 year)	CAR(2 years)
loan	0.00611***	0.00768***	0.00683**	0.0877**	0.153*
	(2.82)	(3.00)	(2.11)	(2.30)	(1.91)
mb	-0.0108*	-0.0176	-0.0200*	-0.256	-0.453*
	(-1.67)	(-1.61)	(-1.67)	(-1.48)	(-1.73)
Lev	-0.0394**	-0.0646**	-0.0404	0.377	-0.0162
	(-2.10)	(-2.30)	(-1.34)	(0.84)	(-0.02)
logat	-0.0000478	-0.000733	-0.00124	-0.0576	-0.0535
	(-0.02)	(-0.20)	(-0.31)	(-0.96)	(-0.54)
ROA	0.0864*	0.145	0.201*	-0.339	-0.538
	(1.83)	(1.25)	(1.73)	(-0.25)	(-0.25)
SUE	-0.0282	-0.0689	-0.101*	-0.960**	-0.614
	(-0.88)	(-1.50)	(-1.92)	(-2.13)	(-0.76)
Block	-0.0437	0.0186	0.0473	0.0814	-1.597
	(-0.73)	(0.25)	(0.52)	(0.08)	(-1.02)
Num of block	0.0105	-0.00595	-0.00607	-0.113	0.265
	(0.92)	(-0.43)	(-0.36)	(-0.47)	(0.64)
_cons	-0.0822*	-0.0848	-0.0914	-0.968	-1.500
	(-1.97)	(-1.48)	(-1.39)	(-1.01)	(-0.88)
N	162	162	162	137	126
adj. R-sq	0.040	0.054	0.054	0.047	0.015

Table 2.13: Bank influence, rating change and long-term bond performance

The table represents the regression results on the effect of bank influence on bond performance controlling future bond rating changes. The dependent variable is 24-month abnormal bond return. Loan is the logarithm outstanding loan balance. Rating change is a dummy variable which equals one if rate is improved, equals negative one if rate is downgraded, and equals zero if rate is constant in two years. The details of variable definitions and measurements of all other variables are reported in the Appendix. Coefficients of the credit ratings should be interpreted as incremental effects with respect to the Ba bonds. T-statistics are heteroskedasticity-robust and cluster by firm. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1) CAR(2 years)	(2) CAR(2 years)
loan	0.0364*	0.0497**
	(1.88)	(2.57)
Rate Change	0.0336	0.0277
	(1.24)	(1.09)
lev	-0.401**	-0.276
	(-2.07)	(-1.40)
roa	-1.036***	-0.821*
	(-2.88)	(-1.83)
logat	-0.0461*	-0.0618**
	(-1.80)	(-2.15)
mb	0.00881	0.0254
	(0.14)	(0.45)
logm	0.0257	0.0260
	(1.26)	(1.52)
logs	0.108**	0.129**
	(2.05)	(2.48)
A and above	-0.0603	-0.0503
	(-1.12)	(-1.00)
Baa	-0.0616	-0.0516
	(-1.38)	(-1.46)
B	-0.0132	-0.0939*
	(-0.22)	(-1.76)
Caa	0.0780	-0.0115
	(0.76)	(-0.10)
C and below	0.107	-0.0357
	(0.81)	(-0.37)
No rating	-0.440**	-0.395*
	(-1.98)	(-1.71)
Secure or senior	0.0892	0.0652
	(1.47)	(1.08)
enhancement	-0.0759	-0.0376
	(-1.08)	(-0.58)
Rule144a	0.0612	0.0539
	(0.63)	(0.54)
callable	-0.0477	-0.0625
	(-0.70)	(-1.08)
putable	-0.193*	-0.219*
	(-1.72)	(-1.88)
SUE		-0.0630
		(-0.47)
block		0.0665
		(0.19)
number of block		0.0838
		(1.18)
Constant	0.0113	-0.230
	(0.03)	(-0.80)
Observations	343	288
Adjusted R^2	0.182	0.222

Appendices

Appendix A

Definition of Varaibles

A.1 Chapter 1: Definition of Variables

Local bank competition:

Deposit Herfindahl Index: Herfindahl-Hirschman index of deposits in an MSA.

Lending Herfindahl Index: Herfindahl=Hirschman index of past three-year bank lending in an MSA.

Firm characteristics:

Log(assets): natural log of total assets.

Leverage: (long-term debt+debt in current liabilities)/total assets.

Return on Assets: EBITDA/total assets.

Market-to-book: (market value of equity+book value of debt)/total assets.

Z-score: modified Altman's (1968) z-score=(1.2 working capital+1.4 retained earnings+3.3 EBIT+0.999 Sales)/total assets. We used modified z-score, which doesn't include market-to-book ratio.

Cash flow volatility: standard deviation of quarterly cash flows from operations over the four fiscal years prior to the loan initiation year scaled by the total assets.

Rating dummy: AAA, AA, A, BBB, BB, B and Below B. Data come from Compustat rating table.

Not Rated dummy: dummy equals 1 if we can't find rating information in Compustat.

Loan characteristics:

Loan spread: loan spread is measured as all-in-drawn spread. All-in-drawn spread is defined as the basis points above LIBOR. This measure includes annual fee and utilization fee.

Log(loan maturity): natural log of the loan maturity. Maturity is measured by month.

Log(loan size): natural log of the loan facility amount. Loan amount is measured in millions of dollars. We exclude all loan measured by foreign currencies.

Security dummy: dummy variable equal one if loan is secured by collateral and zero otherwise.

Missing security: dummy variable equal one if loan does not have security information and zero otherwise.

Performance pricing dummy: a dummy variable that equals one if the loan facility use performance pricing.

Term loan dummy: dummy variable for term loan equals one.

Loan purpose dummies: dummy variables for loan purposes, such as corporate purpose, debt repayment, takeover, etc. I use corporate purpose as a benchmark.

A.2 Chapter 2: Definition of Variables

Bank influence incentive

Loan: logarithm of outstanding loan balance.

Firm characteristics

Logat: natural logarithm of total assets.

Lev: book leverage

MB: (market value of equity+book value of debt)/total assets.

ROA: past four quaters EBIT/total assets.

SUE: standardized earnings surprise.

Block: blockholder ownership.

Num of block: logarithm of number of blockholders.

chairman: CEO is also the chairman on board.

Outside: percentage of outside directors on board.

CEO age: logarithm of CEO age.

Board size: logarithm of number of directors.

d_bank: a dummy equals 1 if bank directors on board.

insider ownership: shareholding of executives and directors.

Bond characteristics

logm: logarithm of bond maturity, measured by month.

logs: logarithm of bond offering amount.

A and up: a dummy equals 1 if credit rating is equal or above A.

BAA: a dummy equals 1 if credit rating is BAA.

BA: a dummy equals 1 if credit rating is BA.

B: a dummy equals 1 if credit rating is B.

CAA: a dummy equals 1 if credit rating is CAA.

CA and down: a dummy equals 1 if credit rating is equal or below CA.

No rating: a dummy equals 1 if no credit rating is available.

Senior or secured: a dummy equals 1 if a bond is senior or senior and secured.

Credit enhancement: a dummy equals 1 if a bond has credit enhancement characteristics.

Rule144A: a dummy equals 1 if a bond is issued under rule 144A.

Callable: a dummy equals 1 if a bond has callable provision.

Putable: a dummy equals 1 if a bond has change of control provision.

Appendix B

Additional Tables for Chapter 1

B.1 Lending Herfindahl Index and Loan Contracting

Lending Herfindahl Index is constructed by previous three-year loans in each MSA. Each loan location is identified by borrower's headquarter location. Lending Herfindahl Index is a direct measure of lending competition in local markets. However, number of loans at most MSAs are very limited. Therefore, it creates noisy for bank competition measurement and restricts the sample only to MSAs where loan lending is available in that year. I find similar results as deposit Herfindahl Index on loan spread. The coefficient of lending Herfindahl Index is insignificant but has the same magnitude as the coefficient of deposit Herfindahl Index.

Table B.1: Lending Herfindahl Index and loan spread

The table represents regressions of loan spread on firm characteristics, loan characteristics, rating dummies, year, industry and geographical fixed effects. The dependent variable is all-in-drawn loan spread. Lending Herfindahl Index is lending concentration at MSA level calculated by loans made in past three years. The details of variable definitions and measurements of all other variables are reported in the appendix. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Standard errors are clustered at package level as well. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1) Loan Spread	(2) Loan Spread	(3) Loan Spread	(4) Loan Spread
Lending Herfindal Index	38.69***	43.98***		
	(2.77)	(2.71)		
HHI * Investment Grade			12.02	10.06
			(0.73)	(0.53)
HHI * Non Investment Grade			69.86***	82.01***
			(3.46)	(3.54)
Log Total assets	6.240***	6.881***	6.320***	6.973***
	(4.26)	(4.41)	(4.31)	(4.46)
Leverage	14.54*	14.03	14.32*	14.40*
	(1.85)	(1.61)	(1.82)	(1.65)
Z Score	-0.0750	-0.0837	-0.0452	-0.0587
	(-0.04)	(-0.04)	(-0.03)	(-0.03)
Return on Assets	-17.98	-17.83	-17.87	-17.96
	(-0.81)	(-0.76)	(-0.80)	(-0.77)
Market-to-Book	-4.710***	-3.967***	-4.682***	-3.914***
	(-3.57)	(-2.98)	(-3.56)	(-2.95)
Log Loan Size	-10.86***	-11.23***	-10.83***	-11.24***
	(-8.38)	(-8.04)	(-8.33)	(-8.03)
Log Loan Maturity	0.0173	0.123	-0.0697	0.0214
	(0.01)	(0.07)	(-0.04)	(0.01)
Performance Pricing	-29.27***	-31.91***	-29.15***	-31.78***
	(-12.46)	(-12.59)	(-12.45)	(-12.58)
Secured Loan Dummy	48.13***	47.69***	48.14***	47.68***
	(12.79)	(11.71)	(12.82)	(11.74)
Missing Security Information	-5.949**	-9.008***	-5.770**	-8.918***
	(-2.53)	(-3.42)	(-2.45)	(-3.38)
Loan Purpose: Merger	20.38***	21.49***	20.26***	21.37***
	(6.46)	(6.32)	(6.41)	(6.28)
Loan Purpose: Debt Repay	-1.493	-0.476	-1.427	-0.382
	(-0.45)	(-0.13)	(-0.43)	(-0.11)
Term Loan Indicator	44.00***	46.23***	43.88***	46.11***
	(16.78)	(16.50)	(16.82)	(16.55)
Constant	96.40***	325.3***	103.4***	332.7***
	(3.26)	(10.75)	(3.47)	(10.92)
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	10012	9116	10012	9116
Adjusted R^2	0.646	0.645	0.646	0.646

Table B.2: Lending Herfindahl Index and number of loan covenants

This table includes regressions of number of all covenants, number of general covenants and number of financial covenants. Lending Herfindahl Index is lending concentration at MSA level calculated by loans made in past three years. The details of variable definitions and measurements are reported in the appendix. All regressions are OLS. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) All Covenants	(2) Financial Covenants	(3) General Covenants	(4) All Covenants	(5) Financial Covenants	(6) General Covenants
Lending Herfindal Index	0.228	0.0603	0.330			
	(0.58)	(0.33)	(1.16)			
HHI * Investment Grade				0.276	-0.0191	0.381
				(0.61)	(-0.09)	(1.16)
HHI * Non Investment Grade				0.161	0.171	0.256
				(0.32)	(0.71)	(0.69)
Log Total assets	-0.444***	-0.165***	-0.239***	-0.444***	-0.165***	-0.239***
	(-6.37)	(-4.95)	(-4.69)	(-6.37)	(-4.95)	(-4.69)
Leverage	0.831***	0.617***	0.423*	0.832***	0.616***	0.424*
	(2.64)	(4.06)	(1.84)	(2.64)	(4.06)	(1.85)
Z Score	0.0398	0.0518**	0.0165	0.0400	0.0517**	0.0167
	(0.77)	(2.12)	(0.44)	(0.77)	(2.12)	(0.44)
Return on Assets	-0.164	-0.220	-0.00977	-0.162	-0.224	-0.00758
	(-0.24)	(-0.67)	(-0.02)	(-0.23)	(-0.68)	(-0.02)
Market-to-Book	-0.106**	-0.0418*	-0.0902**	-0.106**	-0.0420*	-0.0902**
	(-2.03)	(-1.65)	(-2.39)	(-2.03)	(-1.66)	(-2.39)
Log Loan Size	0.391***	-0.0495**	0.387***	0.391***	-0.0495**	0.387***
	(8.69)	(-2.23)	(11.66)	(8.68)	(-2.23)	(11.66)
Log Loan Maturity	0.114**	0.101***	0.0291	0.114**	0.100***	0.0292
	(2.02)	(3.55)	(0.70)	(2.02)	(3.53)	(0.71)
Performance Pricing	0.678***	0.253***	-0.0945	0.677***	0.253***	-0.0949
	(7.19)	(5.29)	(-1.36)	(7.18)	(5.29)	(-1.36)
Secured Loan Dummy	1.390***	0.319***	1.075***	1.390***	0.320***	1.075***
	(13.17)	(6.24)	(13.96)	(13.16)	(6.26)	(13.95)
Missing Security	-0.0485	0.0308	0.0869	-0.0492	0.0319	0.0862
	(-0.47)	(0.61)	(1.14)	(-0.47)	(0.63)	(1.13)
Constant	6.089***	3.594***	3.988***	6.077***	3.614***	3.976***
	(5.42)	(6.79)	(3.91)	(5.40)	(6.82)	(3.90)
Loan Purpose	Yes	Yes	Yes	Yes	Yes	Yes
Covenant Control	Yes	Yes	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3509	3113	3446	3509	3113	3446
Adjusted R^2	0.468	0.435	0.422	0.468	0.435	0.422

Table B.3: Lending Herfindahl Index and loan strictness

This table includes regressions of loan strictness. Lending Herfindahl Index is lending concentration at MSA level calculated by loans made in past three years. The details of variable definitions and measurements are reported in the appendix. All regressions are OLS. Coefficient of credit rating should be interpreted as the incremental effects with respect to credit rating BBB-. Industries are defined as Fama-French 48 industries. Heteroskedasticity-robust t-statistics are reported in parentheses. Significance at the 10%, 5% and 1% level is indicated by *, **, and *** respectively.

	(1) Loan Strictness	(2) Loan Strictness
Lending Herfindal Index MSA	0.0569 (1.18)	
HHI * Investment Grade		0.0398 (0.70)
HHI * Non Investment Grade		0.0814 (1.27)
Log Total assets	-0.0170* (-1.89)	-0.0169* (-1.88)
Leverage	0.318*** (7.74)	0.317*** (7.69)
Z Score	-0.0116* (-1.93)	-0.0116* (-1.93)
Return on Assets	-0.213** (-2.50)	-0.212** (-2.49)
Market-to-Book	-0.0179*** (-2.81)	-0.0180*** (-2.83)
Log Loan Size	0.00348 (0.56)	0.00351 (0.57)
Log Loan Maturity	0.00418 (0.55)	0.00409 (0.53)
Performance Pricing	0.0534*** (4.13)	0.0533*** (4.12)
Secured Loan Dummy	0.0338*** (2.68)	0.0339*** (2.70)
Missing Security Information	0.0127 (1.01)	0.0131 (1.04)
Loan Purpose: Merger	0.0636*** (4.47)	0.0635*** (4.46)
Loan Purpose: Debt Repay	0.0371*** (2.96)	0.0372*** (2.97)
Constant	0.412*** (3.40)	0.415*** (3.42)
Covenant Control	Yes	Yes
Rating FE	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
MSA FE	Yes	Yes
Observations	1812	1812
Adjusted R^2	0.335	0.335

Appendix C

Additional Tables for Chapter 2

C.1 Loans before and after Violation

The table below shows the loan characteristics before and after loan violations. Nini et al. (2011) consider loans made within 6 months after covenant violation as renegotiated loans. Loan information is from DealScan. I find 84 loans renegotiated within 6 months after covenant violation. Generally, renegotiated loans have more restrictive covenants and worse price and non-price terms. The renegotiated loan characteristics are similar to Nini et al. (2011).

Table C.1: Loan contract before and after a covenant violation

The table represents mean loan characteristics for the loans made before covenant violation and within 6 months after covenant violation. According to Nini et al. (2011), loans made within 6 months after covenant violation is considered as renegotiated loans. The loan characteristics come from DealScan. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	Before	After	Difference	Obs
Major loan terms				
maturity(months)	57.5	43.9	-13.6***	79
loan size(millions)	457.46	398.58	-58.88	84
loan spread(bps)	185.08	250.02	64.94***	84
upfront fee(bps)	50.94	61.99	11.05	9
Incidence of non price terms				
secured	0.522	0.579	0.056	84
performance pricing	0.622	0.503	-0.119*	84
number of lenders	13.61	8.4	-5.21*	15
borrowing base	0.119	0.143	0.024	84
sweep	0.81	1	0.19*	26
dividend restriction	0.82	0.87	0.05	61
Incidence of covenants				
Debt-to-EBITDA	0.6429	0.4761	-0.1667**	84
Interest Coverage	0.536	0.357	-0.179**	84
Max CAPEX	0.274	0.214	-0.06	84
Min EBITDA	0.107	0.167	0.06	84
Level of covenants				
Debt-to-EBITDA	4.8	5.55	0.75**	33
Interest Coverage	2.35	2.19	-0.16	25
Max CAPEX	104.29	93.63	-10.67	8
Min EBITDA	81.43	22.18	-59.25	4

C.2 Alternative Measurement of Bank's Incentive to Influence

An alternative measurement of bank influence incentive is the loan percentage, which is measured by outstanding loan balance scaled by total assets. Ozelge and Saunders (2011) use loan percentage to study the relation between bank loan and CEO turnover. I retest the cross-section bond returns and bank influence incentive under loan intensity measurement. The main results are robust to the new measurement of bank influence incentive.

Table C.2: Bank Influence incentive and bond performance

The table represents the regression results on the effect of bank's incentive to influence on abnormal bond return. Loan percentage is an alternative measurement of bank's incentive to influence, which is the outstanding loan balance scaled by total assets. Coefficients of the credit ratings should be interpreted as incremental effects with respect to the Ba bonds. T-statistics are heteroskedasticity-robust and cluster by firm. Significance at the 10%, 5%, and 1% level is indicated by *, **, and *** respectively.

	(1)	(2)	(3)	(4)
	BondCAR(2 years)	BondCAR(2 years)	BondCAR(2 years)	BondCAR(2 years)
loan to assets	0.110**	0.293*		
	(2.13)	(1.86)		
loan to liability			0.0744**	0.204**
			(2.19)	(2.14)
SUE	0.200	-0.0207	0.191	-0.0301
	(0.76)	(-0.14)	(0.71)	(-0.20)
tlev	-0.191***	-0.403*	-0.130***	-0.277
	(-3.29)	(-1.73)	(-3.01)	(-1.39)
roa	-0.174	-0.800*	-0.154	-0.769*
	(-1.17)	(-1.74)	(-1.07)	(-1.70)
logat	0.00153	-0.0127	-0.000563	-0.0173
	(0.24)	(-0.48)	(-0.09)	(-0.65)
mb	-0.0273	0.0183	-0.0239	0.0209
	(-1.56)	(0.30)	(-1.41)	(0.35)
logm	-0.00457	0.0276	-0.00553	0.0266
	(-0.74)	(1.59)	(-0.89)	(1.54)
logs	-0.00130	0.126**	0.000941	0.132**
	(-0.11)	(2.54)	(0.07)	(2.60)
A and above	0.0229	-0.0621	0.0252	-0.0581
	(1.40)	(-1.07)	(1.50)	(-1.00)
Baa	0.0149	-0.0644	0.0170	-0.0597
	(0.86)	(-1.65)	(0.98)	(-1.56)
B	0.0169	-0.0793	0.0149	-0.0847*
	(0.91)	(-1.59)	(0.80)	(-1.67)
Caa	0.0357	0.0274	0.0333	0.0159
	(1.21)	(0.24)	(1.15)	(0.14)
C and below	0.269*	-0.00759	0.260	0.00793
	(1.78)	(-0.11)	(1.65)	(0.12)
No rating	-0.0690*	-0.256*	-0.0683*	-0.262
	(-1.78)	(-1.66)	(-1.77)	(-1.64)
Secured or senior	-0.0443**	0.0918	-0.0472**	0.0839
	(-2.10)	(1.49)	(-2.20)	(1.42)
enhancement	-0.0376**	-0.0428	-0.0359*	-0.0444
	(-2.04)	(-0.69)	(-1.97)	(-0.71)
Rule144a	0.00296	0.0253	0.00319	0.0231
	(0.17)	(0.27)	(0.19)	(0.24)
callable	-0.00948	-0.0598	-0.00838	-0.0618
	(-0.52)	(-1.01)	(-0.46)	(-1.05)
putable	-0.0346	-0.210*	-0.0318	-0.202*
	(-0.88)	(-1.83)	(-0.83)	(-1.76)
block	0.0522	0.143	0.0417	0.137
	(0.62)	(0.40)	(0.52)	(0.40)
Number of block	-0.0158	0.0668	-0.0108	0.0724
	(-0.87)	(0.94)	(-0.61)	(1.05)
Constant	0.237***	-0.306	0.197***	-0.390
	(3.24)	(-1.03)	(2.69)	(-1.26)
Observations	294	288	294	288
Adjusted R-squared	0.141	0.221	0.133	0.216

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