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HOW COMMITTED ARE BANK LINES OF CREDIT?
EXPERIENCES IN THE SUBPRIME MORTGAGE CRISIS

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Abstract

Using the subprime mortgage crisis as a shock, this paper shows that commercial borrowers served by more distressed banks (as measured by recent bank stock returns or the nonperforming loan ratio) took down fewer funds from precommitted, formal lines of credit. The credit constraints affected mainly smaller, riskier (by internal loan ratings), and shorter-relationship borrowers, and depended also on the lenders' size, liquidity condition, capitalization position, and core deposit funding. The evidence suggests that credit lines provided only contingent and partial insurance during the crisis since bank conditions appeared to influence credit line utilization in the short term. It provides a new explanation as to why credit lines are not perfect substitutes for cash holdings for some (e.g. small) firms. Finally, loan level analyses show that more distressed banks charged higher credit spreads on newly negotiated loans but not on funds disbursed from precommitted, formal credit lines. Our analyses are based on commercial loan flow data from the confidential Survey of Terms of Business Lending (STBL).

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Below a CFO explained why her company drew down $2 billion from its credit line in September and October 2008, "to enhance [its] cash position."

David M. Katz (CFO Magazine, Dec 16, 2008)**:** Are you using the cash you've drawn from those credit lines? What's the virtue in drawing down lines of credit and paying interest on debt you are using?

Holly Koeppel (CFO of AEP, one of the nation's biggest generators of electricity):

That's that negative carry. It's nice to have money in the bank …

Katz: But these were existing lines that you could have drawn down at any time. Was there some underlying worry about whether banks could deliver when you needed it?

Koeppel: At the time of the first draw, no. After Lehman, I was not worried about our principal banking relationships, but I certainly felt more comfortable knowing that I had the money in the bank and we were very, very liquid. We've had very strong support from our bank group. We're very grateful for their relationship and support. But I sleep better knowing that we have enough money in the bank.

I. Introduction

Why does a CFO need to worry about her company's access to a legally binding bank line of credit? Maybe bank lines of credit are not as committed as they seem, and maybe there are times when a borrower needs to worry about a lender's credit rating. Koeppel was not alone. Mark Shamber (CFO of United Natural Foods, which has a $400 million credit facility with banks) reportedly "now carefully tracks the financial reports of the publicly traded members of his bank group."

A formal credit line (sometimes known as a revolving credit facility or a loan commitment) is a legally binding commitment for which a bank has charged a fee, which allows the borrower to take down funds at a certain spread over a base rate. Bank lines of credit and cash holdings are the two most popular liquidity management tools used by corporations (Lins, Servaes, and Tufano, 2007). Sufi (2007) finds that 85% of firms in his sample obtained a line of credit between 1996 and 2003, and the line of credit represents an average of 16% of book assets. In Lins et al.'s (2007) international sample, the median line of credit is equal to 15% of book assets, whereas cash holdings comprise only 9% (among which only 40% are not tied up for day-to-day operations).

The theoretic literature considers lines of credit as committed liquidity insurance (Boot, Thakor, and Udell, 1987; Berkovitch and Greenbaum, 1991; Duan and Yoon,

1993; Holmstrom and Tirole, 1998; Morgan, 1994; Shockley, 1995; and Thakor, 2005). The literature also shows that depository banks have a natural advantage in providing liquidity under lines of credits (Kashyap, Stein, and Rajan, 2002; Gatev and Strahan, 2006, 2008; Nini, 2008; Gatev, Schuermann, and Strahan, 2009).

However, the empirical literature on corporate cash holdings finds that firms, and in particular smaller firms, rely a lot on cash for liquidity management (Almeida, Campello, and Weisbach, 2004; Faulkender and Wang 2006; Opler et al. 1999; Duchin, Ozbas, Sensoy, 2008), suggesting that lines of credit do not provide sufficient liquidity insurance for all firms. Sufi (2007) finds that banks provide credit lines that are contingent on maintenance of cash flow and that lines of credit are therefore a poor liquidity substitute for firms that have low existing or expected cash flows.

In this paper we provide an additional explanation as to why bank lines of credit are contingent but not committed sources of liquidity insurance for certain types of firms. Specifically, we show that provision of credit in committed lines of credit is sensitive also to the banks' own financial conditions.

At first sight, precommitted credit lines provide committed insurance for borrowers because both credit limits and terms are set ex-ante and they are legally binding promises. However, we believe that banks can exploit at least two sources of bargaining power to influence credit line takedown volumes.

The first source of power comes from financial covenants. Credit line facilities typically come with financial covenants (Bradley and Roberts, 2003; Chava and Roberts 2007) to mitigate agency problems (Aghion and Bolton, 1992; Berlin and Mester, 1992; Dewatripont and Tirole, 1994). When a firm breaches a financial covenant, it triggers a "technical default." Chava and Roberts (2007) find that about 15% of borrowers are in violation at any point in time and more than a third of borrowers are in violation at some point during their ten-year sample period. However, creditors typically renegotiate the contract, and covenant breaches rarely lead to default or acceleration of the loan (Gopalakrishnan and Parkash, 1995). Arguably, financial covenant violations may become even more common during an economic downturn when many borrowers' sales and cash flows are negatively affected (but they are not necessarily distressed).

The second source of power comes from a "borrowing base" requirement. More than 80% of precommitted credit lines in our sample are secured, but not by real estate collateral. They are most likely credit facilities with a "borrowing base," which is a lending formula that limits borrowings to a certain percentage of collateral, the most common being receivables and inventory. Banks reserve the right to regularly check the collateral, but they also have discretion over the frequency and rigor of auditing. Anecdotal reports in the media (CFO Magazine, May 19, 2009) suggest that, during the crisis, in particular when banks experienced their own capital and liquidity problems and were pressured by regulators, audits of borrowers' working capital became more frequent, which often led to the reduction of loan capacity because many borrowers were sitting on inventories that had depreciated greatly in value.

Therefore, we hypothesize that a bank retains significant influence over credit line utilization because it has discretion over whether to waive the borrowers' current or future compliance with financial covenants or the borrowing base requirement, and therefore credit lines provide only partial and contingent insurance for borrowers. A bank may not invoke the discretion when it is in good financial health. When needed, however, a bank can directly influence credit line takedown volumes by reducing credit availability to borrowers who are not in compliance with covenants or whose collateral (inventory and receivables) has declined in value. A threat of doing so (e.g., auditing collateral) can also persuade less urgent borrowers from withdrawing funds when the bank is in distress.

We use the subprime mortgage crisis (prior to the direct injection of TARP money into bank equity) as a shock to conduct our tests, during which banks experienced severe deteriorations in financial health but the level of distress varied a lot across lenders and over time. We then study how the financial distress that originated in the residential real estate sector affected the new supply of loans to commercial and industrial borrowers (excluding any real estate loans).

Our analyses are based on the confidential Survey of Terms of Business Lending (STBL) data collected by the Federal Reserve, which contain rich information (loan risk ratings, commitment status, etc.) on new commercial loans made by surveyed banks during the first business week of every February, May, August, and November. The data allow us to measure new loan flows, which most other data sets do not.

During the crisis, banks in distress, in order to preserve their own liquidity and capital, if they have the discretion, may have incentives not to honor all liquidity demand from borrowers (Boot, Greenbaum and Thakor, 1993). In a panel of 120 banks over 7 quarters, we empirically show that in more distressed banks (as measured by recent stock returns or the nonperforming loan ratio), pre-committed credit lines reported smaller takedown volumes. Further, we find that the impacts were concentrated on risky borrowers, smaller borrowers, and borrowers with shorter relationships with the banks. We also find that smaller, less liquid, less capitalized, and less retail-deposit-funded banks responded more strongly to their own conditions. The results on the importance of deposit funding are consistent with Ivashina and Scharfstein (2008). However, we also study smaller loans not available in the Dealscan database used in their study. Distinguishing between large and small borrowers provides important, new insights.

Analyzing loan-level data, we also find that in response to the deterioration in their own financial health, banks raised interest rates on new term loans, loans from informal credit lines, and new formal credit lines, but not in precommitted formal credit lines, in which we observe declines in quantities instead.

We are not the first to show that the loan volume from precommitted credit lines is surprisingly influenced also by supply-side factors. Berger and Udell's (1992) study focuses on two "credit crunch" episodes (1978:2-1980:1, 1981:1-1981:4) and they also show that when credit markets are tight, loans disbursed from committed lines are rationed when the commitments should have contractually protected borrowers from rationing. Loan commitments may not be as committed as they seem.

The evidence is inconsistent with the notion that formal credit lines provided committed insurance for borrowers, because takedown volumes in truly committed facilities should be affected only by borrowers' conditions (such as cash flow as documented by Campello, Giambona, Graham, and Harvey, 2009) and not the lenders' conditions. The results provide a new explanation as to why bank credit lines are not perfect substitutes for cash, because access to credit lines is contingent on bank performance in addition to the borrower's own creditworthiness.

Our data and analyses have several key limitations. We do not have information on the identity of the borrowers and therefore are unable to control for industry and

accounting performance of the borrowers. We can only make inference about the size of the borrowers through the size of the credit line facility and about the riskiness of the borrowers through internal risk ratings of loans. Finally, while databases like Dealscan observe facilities' initiations but not takedowns, we in contrast observe takedowns but do not have information on credit facilities that were not drawn upon during the survey weeks. To sum up, we do not know whether borrower demand may have driven the results. Similar to Kashyap and Stein (2000), we draw our conclusion based on the assumption that loan demand does not systematically correlate with variations in lender financial conditions, in particular when those variations originate from exposures in the residential mortgage sector, which are not directly related to the loan demand of commercial borrowers.

Our paper is related to several literatures. First, the literature on how bank performance affects credit supply, including Kang and Stulz (2000), Ongena, Smith, and Michalsen (2003), Khwaja and Mian (2008), Paravisini (2007), and Berger and Bouwman (2008, 2009), Schnabl (2009), Puri, Rocholl, and Steffen (2009). More broadly, the literature on how stock market returns affect real investment, including Blanchard, Rhee, and Summers (1993), Baker, Stein, Wurgler (2003), Chen, Goldstein, and Jiang (2006).

Second, the literature on why credit lines are not perfect substitutes for cash, including Sufi (2007). Ivashina and Scharfstein (2008), for example, find that many firms drew down their credit lines and kept the proceeds in low-yielding cash, leading to a "negative carry."[1] The borrowers' actions can be explained if they worry about their banks' potential future distress, in light of our findings that credit lines from distressed banks are not as reliable a source of liquidity. Campello et al. (2009), using survey data, find that more credit-constrained firms are more likely to preemptively draw on their lines of credits. Their actions are again understandable because those types of borrowers are most likely to be rationed when their lenders are having their own problems.

Finally, our results are important because research has shown that access to bank credit affects corporate financing and real investment policies (Roberts and Sufi, 2008a;

[1] A typical explanation in a company's 10-Q goes like this: "the Company had no immediate needs for additional liquidity; in light of the then current financial market conditions, the Company drew on the facility to provide it with greater financial flexibility."

Lemmon and Roberts, 2007; Chava and Roberts, 2007; Chava and Purnanandam, 2008; Almeida, Campello, and Hackbarth, 2009; Almeida, Campello, Laranjeira, and Weisbenner, 2009; Gao and Yun, 2009).

The rest of the paper is organized as follows. In Section II, we use the Survey of Terms of Business Lending to describe the commercial loan market in the US. In Section III, we present our main regression specifications and analyze takedown volumes of formal credit lines by borrower type and bank type. We also analyze loan pricing using individual loan-level data. In Section IV we conclude.

II. Empirical Design

A. Survey of Terms of Business Lending

Our primary data source is the confidential Survey of Terms of Business Lending (STBL) conducted by the Federal Reserve. The micro-data have been used in many other papers, including Berger and Udell (1992, 2004), Lang and Nakamura (1995), Berger, Saunders, Scalise, and Udell (1998), Berlin and Mester (1999), Berger, Espinoza-Vega, Frame, and Miller (2005), Erel (2007) and Vickery (2008). The Federal Reserve's statistical release E.2., made public with a one-month lag, provides aggregate numbers from the STBL. The micro-data remain confidential information.

The surveys take a snapshot of one week of new loan flows every 13 weeks. If the survey weeks are representative, our data should include about 7.7% of all new loan flows from a bank. The data cover all commercial and industrial (C&I) loans (new loans, takedowns under revolving credit agreements, and renewals) made by a surveyed bank to US addresses with a face value of at least $3,000, disbursed by surveyed banks during the first business week of every February, May, August, and November.

These loans are arguably not directly affected by the problems in the subprime mortgage sector, because the surveys exclude construction and land development loans secured by real estate and loans to financial institutions. Existing loans on which the rates are repriced when no additional funds are disbursed are also excluded. The surveys cover both large syndicated loans studied extensively by many previous papers (typically based on the Dealscan database) and smaller and bilateral loans. The largest loan made during

our sample period was *about* $600 million and the largest commitment was *about* $60 billion.[2]

One of the strengths of the data set is that it covers the new flow of loans. Publicly available data typically report end-of-period outstanding loan volumes and unused commitments. However, both an increase in takedowns and the termination of existing lines can reduce unused commitment numbers, and outstanding loan volume numbers can be affected by new loans, takedowns from existing revolvers, or retirement of existing loans. With end-of-period measures, it is impossible to pin down the timing and causes of the end-of-period changes. The STBL data also include rich information on loan characteristics such as a loan's risk rating and commitment status (formal or informal).

One of the weaknesses is that we do not know much about the borrowers, except some proxies for borrower size, risk, and bank-firm relationship length. Most important, although we know the amount of undrawn credits one month prior to the drawdown, we do not have information on individual credit lines that were not drawn upon during the survey weeks. In our econometric analyses, this shortcoming necessitates aggregating individual loan disbursements to the bank level and estimating models with bank fixed effects, assuming that the composition of existing credit lines does not change much within a short period of time for a bank.

We focus on banks belonging to publicly traded bank holding companies, because their stock returns provide a real-time summary measure of individual bank performance, and such returns are more difficult to manipulate than accounting numbers. Since it is relatively easy to issue public equities in the US, only very small banks are excluded because of this restriction. The smallest publicly traded bank in our sample manages only about $120 million in total assets.

In order to estimate a fixed-effect panel regression model, we require that banks in our sample must have participated in the STBL at least twice. The survey collects data from about 250 domestic commercial banks each time, and our final sample includes

[2] For confidentiality reasons, the two numbers reported here are not exactly the same as the real amounts. Also note that the two numbers may reflect only one bank's allocated portion if the facilities are syndicated. According to a special survey on 50 banks representative of US banking sector size distribution, syndicate loans account for less than 5% of C&I loans for one-fourth of the respondents, between 5% and 20% for one-half, and between 20% and 50% for one-fifth.

about 120 banks belonging to publicly traded bank holding companies.[3] Seven surveys were conducted during the sample period. About 73% of the observations in our panel data set were from banks that didn't miss a single survey during the sample period, and 90% of the observations were from banks that participated in at least four surveys. Therefore, our panel sample is relatively balanced.

B. Overview of the commercial loan market in the US

Table I (Panel A) presents some summary statistics of banks in our sample. A median bank in our sample has $556 million of commercial loans on its books and commits to another $435 million of undrawn commercial credits. The median bank originates about $7.8 million of new commercial loans every week. The sample includes the largest banks in the nation as well. The 95th percentile bank in our sample has about $30 billion of commercial loans, another $54 billion in commitments, and disburses $1.8 billion of new commercial loans every week.

Table I (Panel B) describes the composition of new commercial loans. Consistent with previous studies (Shockley and Thakor 1997; Morgan 1998), in an average bank only 23% of new commercial loans are spot loans, i.e., term loans that are not associated with a credit line of some sort. In our sample 46% of banks make no spot loans at all.

In this study, we focus on *formal* credit lines that are committed at least one week before the takedown. A formal commitment is defined by the STBL as a commitment for which a bank has charged a fee or other consideration or otherwise has a legally binding commitment, which allows the borrower to take down funds at a certain spread over a base rate. Two other types of credit facilities are not the focus of this paper:

(1) Informal credit lines: an informal arrangement under which the bank agrees to lend within a set credit limit and to quote a rate on demand for a takedown amount and maturity requested by the borrower. These arrangements are sometimes called "confirmed credit lines" and may not be legally binding. Lines backing up commercial paper issuances usually fall into this category (Calomiris, 1989).

[3] The matching of banks with CRSP identifiers is based on the New York Fed's list compiled by Adam Ashcraft, whose primary sources are SNL publications. We double-checked and updated a number of matches, mainly caused by the changes in holding company structure since the construction of the New York Fed's list, and several smaller publicly traded bank holding companies that might not be mentioned in SNL publications.

(2) New formal credit lines: formal credit lines that are initiated during the same or previous week of the loan takedown. These are effectively new loans with terms reflecting current updated bank conditions.

Loans disbursed from the above two categories are not really *precommitted*. This paper instead focuses on precommitted, formal lines of credit, which, if they are really precommitted insurance, should not be affected by the financial conditions of the banks themselves.

C. The subprime mortgage crisis

The shock used in this study is the subprime mortgage crisis starting in the summer of 2007, the only one fully blown *national* banking crisis in decades, during which the viability of large and small banks nationwide was in doubt. In the LTCM crisis, in comparison, according to Kho, Lee, and Stulz (2000) based on bank stock returns, only four banks were affected.

Our data sample covers the period from May 2007 to November 2008. The summer of 2007 is considered the beginning of the subprime mortgage crisis. Ivashina and Scharfstein (2008) show that new lending to large corporate borrowers peaked in the period March-May 2007. The crisis was originated from the residential mortgage sector, and its impacts were isolated in the banking sector until the last quarter of 2008. Until then, in sharp contrast to the nosedive of financial stocks, the return on nonfinancial stocks had remained in the positive territory. Throughout the sample period, the share of commercial and industrial loans in nonperforming loan portfolios was never above 12%, and the share was actually declining over time as the problems in residential real estate loans deteriorated.

We end the sample period in November also because of the TARP Capital Purchase Program that started to inject equity directly into banks around that time. Nineteen of the top 20 banks in our sample received TARP money. By bank size, about 80% of large banks and 50% of small banks in our sample eventually received TARP money. After TARP, it became difficult to evaluate banks' own independent strength.

Bank stock returns provide real-time summary indicators of short-term distress, more reliable than book equity valued or credit losses self-reported by banks. Table II

provides some statistics of bank stock returns during the crisis. Recent stock returns are measured at several alternative time horizons, namely, 1 week, 2 weeks, 4 weeks, and 13 weeks (i.e., a quarter) prior to the weeks during which the STBL is conducted. The correlation table in Panel A shows that stock returns measured at different time horizons are highly correlated with each other.

Information in Panel B shows that average bank stock returns were particularly negative over the four-week periods leading up to the first business weeks of August 2007, November 2007, and November 2008, respectively, which were coincident with the two notable flare-ups in financial market stress during the subprime mortgage crisis.

Bank stock returns were more volatile during the banking crisis than in normal times and so were the differences across individual banks. During the banking crisis, the differences between 1st and 3rd quartile banks in terms of stock return performance were on average 15 percentage points, while the difference was only five percentage points for the May 2007 survey, which immediately preceded the start of the banking crisis.

The changing differences in financial distress across banks and over time presumably caused by banks' exposure to the residential real estate sector provide us with useful variations to study how banks' own financial conditions affect the supply of credit to commercial borrowers, in a sample period when the nonfinancial sector was not yet directly affected by the financial crisis.

III. Empirical Analyses

A. Regression model specification

The panel regression model with both bank and time fixed effects is specified as follows. The models are estimated on a panel of 120 banks and 7 time periods. Residuals are allowed to cluster by bank.

$$Ln(\text{Takedown}_{i,t}+1) = \beta_1 * \text{Stock Return}_{i,t} + \beta_2 * NPL_{i,t} + \beta_3 * Ln(\text{Undrawn}_{i,t}+1) + \text{B} * \text{Bank Controls}_{i,t} + \text{Bank Fixed Effect}_i + \text{Time Fixed Effect}_t + \text{constant}$$

"Takedown" is the total weekly dollar volume of loan disbursements under precommitted lines of credit from bank i at time t. The volume is aggregated from individual loan level data. In some large banks that submit less than five days of data during the survey week, the loan volumes are "blown up" to five days proportionately.

By taking the log of the dependent variable, the coefficients can be conveniently interpreted as the percentage decline of takedown volume for every percentage point decline in stock prices or every 0.01 increase in the nonperforming loan ratio (NPL).

We model the level instead of the change rate of the takedown volume. The takedown volume is a flow variable in itself, and a panel model with bank fixed effects effectively analyzes the flow's first-order difference. Taking further difference of it would measure instead the *third-order* change rate of credit supply. In some regression specifications, we also aggregate takedown volumes by several loan categories of interest (e.g., large facilities, relationship borrowers, risky borrowers) to tap into loan-level information available to us.

We use banks stocks returns and the nonperforming loan ratio to measure banks' financial health. The bank stock return is a summary indicator of short-term distress.[4] Since banks do not depend much on frequent equity issuance for funding, lower stock returns do not necessarily reflect financial constraints as a result of lower valuation (Baker, Stein, Wurgler, 2003), but the market's aggregated information about the banks' conditions (Blanchard, Rhee, and Summers, 1993; Chen, Goldstein, Jiang, 2006; Hertzel et al., 2008). Stock returns are measured as the log return of bank stock price (adjusting for splits and dividends) relative to four weeks ago. We also use 1 week, 2 weeks, and 13 weeks (i.e., a quarter) as alternative horizons.

A second measure of bank financial distress is the ratio of nonperforming loans to total loans, which reflects bank asset quality and is more difficult to manipulate than other accounting indicators because of its objective definition (e.g., loans overdue for more than 90 days are considered nonperforming). The data are obtained from regulatory reports filed based on financial information at the end of every March, June, September, and December, about one month prior to the STBL, which takes place in the first week of February, May, August, and November. Throughout the sample period, the share of commercial and industrial loans in nonperforming loan portfolios was never above 12%, and was actually declining over time as the problems in residential real estate loans

[4] The Interagency Guidance on Funding and Liquidity Risk Management, issued jointly by five U.S. bank regulators, defines stress events as "deterioration in asset quality, changes in agency credit ratings, Prompt Corrective Action (PCA) and CAMELS ratings downgrades, widening of credit default spreads, operating losses, declining financial institution equity prices, negative press coverage, or other events that may call into question an institution's ability to meet its obligations."

deteriorated. This mitigates the endogeneity concern that the nonperforming loan ratio may reflect the deterioration of borrowers' conditions.

Unfortunately, credit default swap (CDS) prices cannot be used as an alternative measure because they are available for very few US commercial banks. Unlike the active CDS markets for European banks, market quotes are currently available for only four US commercial banks, two investment banks, and two credit card banks in the US.[5] For the four commercial banks, CDS returns are negatively correlated with equity returns, both across banks and over time. Even during the abnormal period of October 2008 when CDS prices and bank stock prices moved unusually in the same direction (i.e., down), the two variables were negatively correlated *across* banks.

The limitation of our data set is that we do not have information on credit lines that are not drawn upon. In addition to aggregating loan volume to the bank level, we take two steps to address the heterogeneity of takedown volume across banks.

First, as banks enter the survey multiple times, we are able to estimate a bank fixed-effect panel regression model. Data limitations prevent us from directly observing the takedown habit and patterns of credit line customers unless they draw on the credit lines. For example, if a bank's customers use the lines mostly for short-term working capital management and repay loans frequently, then the bank's gross loan *flow* will inevitably be higher than in other banks with similar amounts of undrawn credit available. Bank fixed effects address this problem if we can assume that a bank's credit line customer composition does not change rapidly within a short period of time, and therefore its aggregate takedown volume should have a strong bank-specific component.

Second, we control for "Undrawn," the bank's undrawn portions of legally binding loan commitments, because obviously takedown volume is affected by the amount of commitments available. Specifically, following Kashyap, Rajan and Stein (2002) we use data item RCFD3818 from the regulatory Call Report of Income and Condition. The data reflect information about one month prior to the survey week. The variable is included on the right-hand side of the equation for two reasons. First, it is a noisy variable, although it is the best available. The variable includes mostly commercial and industrial loan commitments, but it also includes small amounts of commitments to

[5] Based on information from the Bloomberg terminal as of June 2009. Datastream has similar coverage.

purchase securities or other assets. Not all takedowns from those facilities are covered by the STBL. For example, loans to financial institutions are not covered by the STBL. Second, reported one month ago, it is a noisy measure of undrawn credit immediately prior to the survey week. Finally, the variable also doubles as a control for bank size, since the two are highly correlated.

Finally, we also control for some bank financial characteristics. In a panel regression model with bank fixed effects, the coefficients on them will capture the effects of time series fluctuations in these bank characteristics. The control variables include equity to asset ratio, core deposit ratio, liquid asset ratio, and return on assets.

These financial ratios are based on information from consolidated financial reports (Y-9C) filed by the bank holding companies.[6] We believe that it is the consolidated bank holding company's financial health that matters the most. As in the Call Report, the information from the Y-9C is about 1 month old by time the lending decisions are made.

B. Regression estimation results

B.1. Credit line takedowns are sensitive to bank distress

In Table III, we estimate our main regression specification with four alternative measures of stock returns, i.e., stock returns relative to four weeks, one week, two weeks, and one quarter (13 weeks) ago. The regressions include time fixed-effects dummy variables, therefore automatically adjusting the bank stock returns for general stock market conditions.

[6] The formula for the financial ratios are as follows:
Equity to Total Asset Ratio = bhck3210/bhck2170
Core Deposit to Total Asset Ratio = (bhcb2210+bhcb3187+bhcb2389+bhcb6648+bhod3189+bhod3187+bhod2389+bhod6648+bhfn6636)/bhck2170
Nonperforming Loan to Total Loan Ratio = (bhck5526-bhck3507+bhck1616+bhck5525-bhck3506)/bhck2122
Liquid Asset to Total Asset Ratio = (bhck0010+bhdmb987+bhckb989+bhck1754+bhck1773)/bhck2170
Return on Asset Ratio = bhck4340/bhck3368

The results in Column (1) suggest that a 1% decline in stock price in the past four weeks is related to a 2.68% lower takedown volume in credit lines. A 0.01 increase in the nonperforming loan ratio is related to a 45% lower takedown volume.

The results suggest that a bank's credit line takedown volume is 15×2.67= 40% lower when its stock return in the past four weeks is 15% lower (which is the 1st to 3rd quartile difference in bank stock returns). Similarly, the takedown volume is 0.012 ×45.48= 63.7% lower when its nonperforming loan ratio increases by 0.012 (which is the 1st to 3rd quartile difference in the nonperforming loan ratio).

In Column (2), we also control for stock returns over the four-week period *after* the survey week, to address the possibility that banks may have private information that the stock market learns only later. We find that the takedown volume is 1.1% lower for every 1% drop in stock return over the next four weeks. However, the influence of future returns is not statistical significant. After controlling for future stock returns, every 1% lower stock return in the past four weeks still leads to 2.18% lower takedown volumes.

In Columns (3), (4), and (5), stock returns are measured relative to one week, two weeks, and thirteen weeks (one quarter) prior to the loan takedowns. The effects of bank stock returns on takedown volumes seem to be stronger for more recent returns. For every 1% decline in stock price, the impact on loan volume is 3.5% after one week, 2% after two weeks, 2.7% after four weeks, and 0.9% (and not statistically significant) after thirteen weeks. The results suggest that bank stock returns have a short-term impact on loan volumes, and the impact diminishes to zero within a quarter. Therefore, our *flow* data on new loans have a unique advantage over typical quarterly end-of-period stock measures of loans outstanding used in other studies, because with the latter measure it is not possible to pin down the timing and the causes of the change in the numbers for end-of-quarter loans outstanding.

Finally, the coefficient on the variable for undrawn loan commitments one month ago is close to 0.9, suggesting that a 1% decline in undrawn commitments translates into almost a 0.9% decline in takedown volume one month after.

B.2. Takedowns by risky, nonrelationship, and smaller borrowers

So far we have treated takedowns by all borrowers equally. In the next step, we distinguish takedowns by borrowers of different characteristics. The results are reported in Table IV.

First, we distinguish between high-risk and low-risk borrowers. The data set contains loan risk ratings provided by the banks. We define high-risk loans as those internally rated as four or five (in a 1-5 scale), or nonrated (in banks that do have a rating system), *at the time of loan disbursement*.

A rating of four is defined as "acceptable risk." Loans in this category have a limited chance of resulting in a loss. A rating of five is defined as "special mention or classified asset" – loans in this category would generally fall into the examination categories: "special mention," "substandard," "doubtful," or "loss." They would primarily be workout loans. Nonrated loans are typically smaller, more risky loans and carry an average interest rate just below those loans rated four. We exclude a small number of banks that do not have a risk-rating system at all. A caveat is that as ratings are inevitably subjective (English and Nelson, 1998), they may be more informative in comparing borrowers within the same bank.

In Column (1), the dependent variable is the total volume of takedowns by lower risk borrowers, while in Column (2) it's the total volume of takedowns by higher risk borrowers. We find that it is mostly high-risk borrowers that are affected by their banks' financial conditions. We find that in response to a 1% lower bank stock return, the loan volume for higher risk borrowers is 2.3% lower, whereas that for lower risk borrowers is only 0.9% lower (and not statistically significant). This is consistent with Ivashina and Scharfstein's (2008) findings that non-investment-grade loans fell more than investment grade loans during the subprime mortgage crisis and with Lang and Nakamura's (1995) findings that banks lend more to less risky borrowers during economic downturns.

Second, we distinguish between borrowers of longer and shorter relationship with the bank. We define relationship borrowers as those who draw down on lines committed more than 365 days ago. The measure is imperfect because some borrowers may have multiple facilities with the banks and we do not observe those that are not drawn upon during the survey weeks. However, we are sure that borrowers classified by us as

relationship borrowers clearly have relationships of more than one year with their banks. Berger and Udell (1995) consider a formal line of credit as a formalization of bank-borrower relationships and find that borrowers with longer banking relationships enjoy better terms in their lines of credit.

In Columns (3) and (4), the dependent variable is the total volume of takedowns by relationship and nonrelationship borrowers, respectively. We find that in response to a 1% lower bank stock return, the loan volume for borrowers with shorter relationships is 2.3% lower, whereas that for borrowers with relationships of more than one year is 0.2% higher (not statistically significant).

Third, we distinguish between large and small borrowers. We do not have a direct measure of borrower size. Following the previous literature (Erel 2007; Vickery 2008) that uses the same data, we use the commitment size of the credit lines as proxies for borrower size. Both Melnik and Plaut (1986) and Ham and Melnik (1987) find that the size of the credit line commitment is positively related to firm size. In Column (5), the dependent variable is the total loan takedown volume by borrowers with a credit line of at least $10 million with the bank, while Column (6) is for borrowers with a smaller line.

In Columns (7) and (8), we use an alternative measure of borrower size based on loan size. The dependent variable in Column (7) is the total volume of loan takedowns of at least $0.5 million, while Column (8) is for smaller loan takedowns. Note that the small borrowers in our sample, based on either definition, are unlikely to be present in Ivashina and Scharfstein's (2008) sample of large syndicated borrowers from the LPC Dealscan database.

Results in Columns (5)–(8) show that smaller borrowers are significantly affected by their banks' financial conditions, whereas the amount of funds disbursed from large credit line facilities actually *increases* slightly in response to heightened bank distress, that is, a 0.6% increase (but not statistically significant) for large facilities vs. a 2.2% decrease for small facilities in response to a 1% lower stock return. The results are consistent with those of Ivashina and Scharfstein (2008), who find that borrowers (typically very large ones) in their sample were able to draw on credit lines at the height of the financial turmoil.

There are two possible explanations for this discrimination. First, large borrowers are considered more important customers for the banks because they have more outside options and thus better bargaining positions. Second, larger credit lines are more likely to be part of a syndicated deal, and therefore, individual banks may not have strong control over the borrower's takedown decisions.

The results also shed some light on the reverse causality concern. Dahiya, Saunders, and Srinivasan (2003) find that there is a significant wealth effect for the shareholders of the lead bank when an isolated large borrower of the bank experiences distress. However, it is less likely that the financial distress of some small borrowers may drive the bank's stock market performance.

To sum up, in this section we find that the results previously documented in Section B.1 are stronger for credit lines to risky borrowers, nonrelationship borrowers, and smaller borrowers. In all regressions, the sensitivity of takedown volume to nonperforming loan ratio (an alternative measure of bank performance) is also stronger for these borrower categories.

B.3. How may banks influence takedown volumes of precommitted lines of credit?

At first sight, precommitted credit lines should provide insurance for borrowers because both credit limits and terms are set ex-ante. Takedown volumes under precommitted credit lines are supposed to be determined purely by the demand from borrowers. Why do we find that they are also affected by the banks' own financial conditions? A very intuitive answer, along the lines of Sufi (2007), is that these credit lines may not be as "committed" as on paper. Banks may retain some implicit influence over borrowers' takedown decisions, and the influence may come from some important discretion enjoyed by the banks.

First, banks have discretion over whether to waive the borrower's current or future compliance with covenants, as well as the renewal of credit facilities.

Credit lines typically come with financial covenants (Bradley and Roberts, 2003; Chava and Roberts 2007). However, when a firm breaches a financial covenant that leads

to a "technical default," the creditor typically renegotiates the contract and it rarely leads to default or acceleration of the loan (Gopalakrishnan and Parkash, 1995).[7]

Such technical defaults are very frequent even during normal times and outside of financial distress (Gopalakrishnan and Parkash, 1995; Dichev and Skinner, 2002), because covenants are intentionally set very tight; i.e., the distance between the covenants' threshold and the actual accounting measure is very small (Kahan and Tuckman, 1995; Garleanu and Zwiebel, 2009). Chava and Roberts (2007), for example, show that about 15% of borrowers are in violation at any point in time, and more than a third of borrowers are in violation at some point during their ten-year sample period.

Arguably, such violations are expected to be more likely during an economic downturn when many borrowers' cash flows are negatively affected by the economy. Therefore, banks were in a much stronger bargaining position during the crisis and could pressure borrowers who may worry about future unfavorable treatment even when they are currently in full compliance with all covenants.

Second, banks also have discretion over the intensity of collateral auditing. In addition to a maximum credit limit, many credit lines also specify a "borrowing base," which is a lending formula that limits borrowings to a certain percentage of collateral, the most common being receivables and inventory. Firms are not allowed to borrow more than their "borrowing base." Banks reserve the right to regularly check the collateral, but they also have discretion over the frequency and rigor of auditing. More than 80% of precommitted credit lines in our sample are secured, but not by real estate collateral. They are most likely credit facilities with "borrowing base" restrictions.

Anecdotal evidence (CFO Magazine, May 19, 2009) suggests that during the good times, banks may not regularly conduct the audits of inventories or accounts receivable and simply trust that what borrowers claim in their weekly or monthly updates is accurate. They are more likely to waive the right of inspection to win over a borrower. In contrast, during the crisis, in particular when they experienced their own capital and liquidity problems and were pressured by bank examiners from regulatory agencies,

[7] Roberts and Sufi (2008b) show that renegotiations of loan facility terms occur in 90% of firms over the life of the facilities. They argue that covenants are included not to avoid renegotiations but to shape ex-post bargaining power during negotiations. The banks may waive the borrower's noncompliance with covenants if the borrowers reduce capital expenditures (Chava and Roberts, 2007). Banks may also alter the terms and reduce allowable borrowings (Beneish and Press, 1993; Chen and Wei, 1993) after technical violations.

banks stepped up their auditing intensity significantly and started to exclude from eligible collateral "unsellable T-shirts for 7-foot-tall women." The audits very often led to a reduction of the borrowing base, because many firms were sitting on products that they had overpaid for before the crisis and receivables from troubled clients such as the big three automakers.

After the audits, a bank may immediately require the borrower to post more collateral or lower the loan balance to the new borrowing base. Therefore, collateral audits provide another tool for the banks to control takedown volumes when they want to. Anecdotal evidence also suggests that during the crisis, many collateral auditors were asked by banks to look at companies that previously weren't inspected, and audits became much more frequent (sometimes semi-quarterly) when a borrower was on the brink of breaking loan covenants or when a credit line was up for renewal.

To sum up, although both credit limits and terms are set ex-ante, banks retain significant influence over borrowers' takedown decisions because banks have discretion over whether to waive the borrower's future covenant violations, to renew contracts, and to audit collaterals. Borrowers choose to cooperate if they value future relations with the banks. Roberts and Sufi (2008a) find that borrowers rarely switch lenders even after banks have imposed unfavorable terms after covenant violations.

B.4. Takedown volumes in different types of banks

Gatev and Strahan (2006) find that banks with a strong core deposit base are in a stronger position to provide liquidity during financial market turmoil. Gatev and Strahan (2008) in particular show that in loan syndications, banks (vs. nonbank investors) are more likely to participate in loan deals that involve a credit line and thus contingent liquidity needs. Ivashina and Scharfstein (2008) find that banks with better access to deposit funding were less likely to curtail lending during the subprime mortgage crisis. Further, Berger and Bouwman (2008, 2009) document that better capitalized banks create more liquidity during banking crises than poorly capitalized banks.

In Table V, we estimate the same regressions for different types of banks. We sort the banks into many half groups based on measures of various bank characteristics. Banks are divided into two groups based on the ratio of core deposits to total assets

(median=0.5892), the ratio of liquid assets to total assets (median=0.1922), the ratio of equity to total assets (median=0.0948), or total assets (median= $7.128 billion). A bank's type is decided by its average financial ratios or size over the whole sample period.

We choose to estimate the regression models separately for a subgroup of banks, because the alternative methods, interaction terms, create severe multicollinearity problems for us. For example, the correlation is as high as 0.687 between the 4-week stock return and the interaction term: (4-week stock return)* (high liquidity ratio dummy). Our approach sacrifices some estimation power. When drawing conclusions from the results below, we focus more on the economic significance of the differences, which help us make statements on the distributional effects (e.g., in which types of banks are the effects concentrated?). However, we cannot say much about the statistical significance of the differences across two types of banks.

Results in Columns (1) and (2) show that among banks funded less by core retail deposits, takedown volumes are 3.2% lower in response to a 1% stock price decline. By contrast, the drop in volume is only 1.6% among banks funded more by core retail deposits.[8]

For a 1% drop in bank stock price, the takedown volume is 3.3% lower among low-liquidity banks, vs. 1.9% lower among high-liquidity banks (Columns 3 and 4). The volume is 3.8% lower among low capital banks, vs. 0.8% among high capital banks (Columns 5 and 6). The volume is 4.5% lower among small banks, vs. 0.4% lower among large banks (Columns 7 and 8).

The results provide suggestive evidence that banks hold liquid assets to address liquidity needs arising from loan demand (Kashyap et al. 2002). The results are consistent with Kashyap and Stein's (2000) results that small and illiquid banks adjust their loan supply more actively in response to adverse conditions (in their case policy-induced monetary policy tightening).

[8] We likely underestimate the importance of core retail deposits. First, unlike in Gatev and Strahan (2006) and Ivashina and Scharfstein (2008), we do not have investment banks (such as Goldman Sachs, Lehman Brothers, Merrill Lynch) or finance companies (CIT group and GE Capital) in our sample. In Ivashina and Scharfstein's (2008) sample, the 25th percentile bank has no deposits at all. By contrast, in our commercial bank sample the difference in core deposit ratio between 25th and 75th percentile banks is just above 10%. Second, the FDIC's decision to raise guarantee limits for deposits probably reduced the disadvantage of those banks with lower core deposits.

It is interesting to note that takedown volume is more sensitive to the nonperforming loan ratio among more highly capitalized banks (Columns 5 and 6) and more deposit-funded banks (Columns 1 and 2). It is possible that when a bank is highly capitalized with equities or when a bank is funded by relatively stable deposits, it is more concerned with rising credit problems on its loan books (as measured by the nonperforming loan ratio) because the bank's high franchise value may discourage risk-taking.

To sum up, the subprime mortgage crisis has distributional effects on lenders and borrowers. The heterogeneity of credit supply across banks during the crisis resulted not only from differences in bank distress but also from the interaction of bank distress with bank balance-sheet structures (e.g., funding structures, liquidity conditions, size). The aggregate loan volumes in the banking sector may still go up, but they will mostly come from large and more liquid banks with fewer exposures and fewer losses from the real estate sector. Small and risky borrowers that are served by small and illiquid banks with few retail deposits will likely be disproportionately affected.

B.5. Loans without prior commitments

This study focuses on formal credit lines that are committed at least one week before the takedowns. Three other loan categories are not the focus of this paper because their credit terms can be adjusted in response to recent changes in bank financial conditions: (1) Spot loans: term loans not made under any credit line facilities; (2) Informal credit lines: the terms of which are determined at the time of loan disbursement; (3) New formal credit lines: loans disbursed from formal credit lines that are initiated during the same or previous week.[9]

How do banks adjust loan quantity and prices in these categories? To help understand why banks ration credit in formal credit lines, in this section we study the

[9] Note that the takedown volume under newly initiated credit lines may not be a good proxy for the origination volume of new formal credit lines, because the data allow us to observe only those lines that are drawn upon during the survey weeks. The variable is more a measure of the origination volume of formal credit lines that tend to be tapped into almost immediately after initiations, which can be very different from other credit lines. For example, we notice that the commitment sizes tend to be smaller but the loan takedowns tend to be larger. These loans are more likely to charge fixed interest rates.

changes in quantities, and in the next section, the changes in pricing terms of newly negotiated commercial loans, in response to changes in banks' own financial conditions.

In Columns (1) – (3) of Table VI, the dependent variables are, respectively, the total volume of new spot loans, takedowns under *informal* credit lines, and takedowns under new formal credit lines. What these three loan categories share in common is that they are not bounded by terms set in the past before the changes in bank conditions. For spot loans, we control for the amount of C&I loans outstanding one month before. For the latter two categories, we control for the amount of undrawn credits.

We find that loan volume in none of the three categories responds significantly to the banks' own financial conditions, measured by banks' stock returns or nonperforming loan ratios. In other words, more distressed banks do not reduce loan volume in these categories more than less distressed banks. However, in the next sub-section, we will show that distressed banks raise interest rates instead, in these loan categories.

In Column (4) we use the total volume of all new commercial loans as the dependent variable, which include all categories, both spot loans and credit line takedowns, formal and informal credit lines, old and new credit lines. We find that the total volume of new commercial loans is not sensitive to the banks' own financial conditions. To sum up, the evidence above suggests that banks respond to deterioration in their own financial conditions mainly by rationing precommitted, formal credit lines. Research based on publicly available data that do not observe loan flows and do not distinguish between term loans and takedowns from credit lines would most likely not be able to uncover what we find in this paper.

B.6. Distressed banks raise credit spreads on new loans but not in precommitted formal credit lines

Since we also have access to loan-level data, in this section we analyze credit spreads of new loans. In response to changes in their own financial conditions, banks can adjust the credit terms of new loans, including new spot loans, informal credit lines (because their terms are negotiated at the time of loan disbursement), and newly negotiated formal credit lines. However, they cannot do much about the interest rates on precommitted revolving credit facilities.

Credit spreads on individual loans are described by the following empirical model:

$$Spread = \beta_1 * \text{Stock Return}_{i,t} + \beta_2 * NPL_{i,t} + \Lambda * \text{Loan Controls}$$
$$+ \text{B} * \text{Bank Controls}_{i,t} + \text{Time Fixed Effect}_i + \text{constant}$$

Following Erel (2007), who uses the same data set, credit spreads (in %) are measured as effective (compounded) annual nominal interest rates over yields on Treasury securities of similar repricing intervals. The spreads do not include fees, which may differ across large and small facilities. But we will control for loan and facility size.

Loan controls include the log of loan size, log of loan commitment size, dummy variables for secured (collateralized) loans, for loans with maturity greater than one year (including loans without a stated maturity), for loans without a stated maturity, and for fixed-rate loans. Loan risks are controlled for with dummy variables for nonrated loans (in banks that do rate loans), dummy variables for loans with an internal risk rating of 2 through 5, respectively, and a dummy variable for loans that are not rated because the banks do not rate loans. Loans with a risk rating of 1 are used as the benchmark and a dummy variable for them is not included in the regressions. Table VII summarizes the characteristics of individual loans in our sample. Relative to credit facilities in the Dealscan database, facilities in our sample are smaller and are much more likely to be secured (collateralized) partly because typically only very large and creditworthy borrowers can obtain credit without collateral.

Bank performance is measured using bank stock returns relative to one month ago and the nonperforming loan ratio one month ago. We further control for bank characteristics using financial ratios such as the equity ratio, core deposit ratio, liquidity ratio, and return on assets. We also control for bank size using the log of total commercial loans outstanding. Time fixed effects are included, and all standard errors are adjusted for the clustering of residual by banks.

In Table VII, we estimate the credit spread model separately for four different types of loans. Specifically, Column (1) is for loans disbursed from precommitted formal credit lines, Column (2) is for loans disbursed from credit lines initiated in the same or previous week, Column (3) is for loans disbursed from informal credit lines, and Column (4) is for new term loans not affiliated with any credit lines. Arguably, banks can directly

adjust loan terms in the latter three categories, in response to recent changes in their own financial conditions.

As expected, we find that the credit spreads increase about 17 bps on loans disbursed from informal credit lines or recently negotiated formal credit lines, for every 0.01 increase in a bank's nonperforming loan (NPL) ratio one month ago. Credit spreads increase about 14 bps for new term loans, for every 0.01 increase in NPL ratio.[10] We do not find past stock returns to have significantly affected credit spreads.

By contrast, credit spreads on loans disbursed from precommitted formal credit lines do not respond significantly either to poor stock price performance or to deteriorations in NPL ratios. This is expected because credit spread in a loan commitment is set ex-ante. Even if we allow the commitment contract to be renegotiated, we can think of two possibilities that explain the results. First, instead of raising credit spreads by 17 bps on loans disbursed from precommitted formal credit lines as they would have done in informal credit lines (as shown above), the banks somehow exert influence on borrowers to reduce takedown volume by 45% (as shown in Section B.1), leading to lower loan quantity. Second, the banks may have renegotiated many existing contracts to raise interest rates significantly, but as a result, those borrowers were less likely to take out funds and therefore did not enter the STBL sample.

IV. Conclusions

Using the subprime mortgage crisis as a shock, this paper shows that more distressed banks (as measured by recent stock returns or the nonperforming loan ratio) disbursed fewer funds to commercial and industrial borrowers under precommitted credit lines. Risky borrowers (by internal loan ratings), smaller borrowers, and borrowers with shorter relationships were more affected. The evidence suggests that credit lines provide contingent, partial, instead of committed insurance for borrowers and provides a new explanation why credit lines are not perfect substitutes for corporate cash holdings, at least not for smaller, riskier firms with relatively short relationships with their lenders. Our explanation for the sensitivity of credit line utilizations to banks' own financial

[10] Note that our data allow the analyses of interest rates only, while Campello et al. (2009) also document the increase in commitment fees for newly negotiated lines.

conditions is that banks may have significant influence on borrowers' takedown decisions, resulting from their discretion over the borrowers' compliance with financial covenants.

One of our data's main weaknesses is that we do not have information on credit facilities that were not drawn upon during the survey weeks. By contrast, databases such as Dealscan observe facilities' initiations but not future takedowns. Future research that tracks takedown volumes over time by hand-collected information from borrowers' SEC regulatory filings may be able to shed more light on the detailed mechanism through which banks influence borrowers' takedown decisions in precommitted credit lines, in particular, with information on the borrowers' financial conditions (e.g., distance to covenant violations) during the lenders distressed periods, and the borrowers' future access to credit and renegotiation outcomes with the same lenders.

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Table I (Panel A): Summary of bank characteristics

This table describes banks in our sample. The summary statistics are based on a panel of 120 banks and 682 observations. C&I loans are commercial and industrial loans outstanding on a bank's book. C&I commitments are undrawn portions of formal commitments to make C&I loans. Weekly C&I loans are the weekly volume of new C&I loan flow during a survey week. Commitment to total exposures ratio is calculated as C&I commitment / (C&I commitment + C&I loan)

	Mean	S. Dev.	25th	Median	75th	95th
C&I loan ($000)	5,380,946	14,400,000	172,473	556,495	1,677,809	30,100,000
C&I commitment ($000)	13,500,000	53,600,000	120,633	434,598	1,600,456	54,400,000
Weekly C&I loan ($000)	237,620	699,926	2,079	7,796	48,350	1,829,082
Commitment/ Exposures	0.478	0.143	0.402	0.465	0.540	0.745
Deposit ratio	0.705	0.086	0.654	0.717	0.764	0.819
Core deposit ratio	0.583	0.090	0.536	0.590	0.643	0.712
Equity ratio	0.094	0.019	0.082	0.095	0.106	0.127
Liquidity ratio	0.223	0.103	0.154	0.195	0.263	0.477
NPL ratio	0.013	0.013	0.006	0.009	0.015	0.036
quarterly ROA	0.005	0.006	0.003	0.005	0.007	0.013
quarterly ROE	0.048	0.069	0.028	0.048	0.079	0.129

Table I (Panel B): Composition of new commercial loans

This table describes the composition of new commercial loans in STBL data. The ratios are the shares of a certain type of loans in a bank's new commercial loan flow. The summary statistics are based on a panel of 120 banks and 682 observations. Risky loans are loans with an internal risk rating of 4 or 5, or non-rated. Formal credit lines are loans disbursed from legally-binding commitments. Relationship loans are loans disbursed from formal credit lines initiated or renewed more than one year ago. Large facility loans are loans from formal credit lines with commitment size of greater than $10 million. Spot loans are term loans not associated with a credit line facility. Informal credit lines are lines of credit that are not legally binding, and the terms of which are negotiated at the time of disbursement.

%	Mean	S.Dev.	Non-Zero observations (%)	25th	Median	75th
Risky loan	38.5	35.9	83.4	2.6	30.3	73.7
Formal credit lines	42.2	40.5	60.7	0.0	39.3	83.3
- risky	15.2	23.8	50.9	0.0	0.1	24.9
- relationship	15.0	21.5	50.4	0.0	0.2	26.5
- large facility	16.6	26.2	41.1	0.0	0.0	26.8
- large loan	20.1	28.5	42.1	0.0	0.0	37.8
Spot loans	22.7	35.2	53.8	0.0	1.1	33.7
Informal credit lines	14.5	32.9	26.2	0.0	0.0	0.0
New credit lines	20.5	30.5	70.8	0.0	6.5	25.4

Table II: Bank stock performance during the subprime mortgage crisis

Panel A: Correlation between past stock returns at different time interval

This table describes the piecewise correlation between stock returns measured at different time intervals.

Correlation table	4 weeks return	1 weeks return	2 weeks return	13 weeks return
4 weeks return	1			
1 weeks return	0.4058	1		
2 weeks return	0.7536	0.5372	1	
13 weeks return	0.3430	0.1854	0.2526	1

Panel B: Summary statistics of bank stock returns

This table provides summary statistics of bank stock returns. Stock returns are log change in stock prices relative to one week, two weeks, four weeks, and 13 weeks ago. For stock return relative to four weeks ago, summary statistics are presented also by different time periods.

Log stock return (%) relative to	Mean	S.Dev.	25th	Median	75th
1 week ago	2.56	8.22	-2.41	1.20	7.42
2 weeks ago	1.48	11.04	-5.04	0.02	7.68
4 weeks ago	-1.83	14.82	-11.86	-1.29	6.71
- May 2007	0.14	4.61	-2.82	0.22	3.27
- Aug 2007	-12.65	10.03	-18.03	-13.00	-8.31
- Nov 2007	-12.08	10.14	-18.76	-14.11	-5.57
- Feb 2008	9.80	8.75	2.96	10.83	16.54
- May 2008	-0.40	10.84	-3.73	0.89	6.37
- Aug 2008	12.74	14.39	5.19	13.82	23.52
- Nov 2008	-9.94	16.69	-16.19	-9.31	0.74
13 weeks ago	-7.86	17.63	-15.43	-5.58	1.99

Table III: More distressed banks experience lower takedown volumes in their *pre-committed* credit lines

The panel regression model with bank fixed-effect is specified as follows:

$$Ln(\text{Takedown}_{i,t}+1) = \beta_1 * \text{Stock Return}_{i,t} + \beta_2 * NPL_{i,t} + \beta_3 * Ln(\text{Undrawn}_{i,t}+1)$$
$$+ \text{B} * \text{Bank Controls}_{i,t} + \text{Bank Fixed Effect}_i + \text{Time Fixed Effect}_t + \text{constant}$$

The dependent variable is the log of weekly takedown volume under precommitted formal credit lines. Bank stock returns are measured relative to one week, two weeks, four weeks, and thirteen weeks ago. A second measure of bank distress is the bank's nonperforming loan ratio. Also controlled for are, unused portion of loan commitments, equity ratio, core deposit ratio, liquid asset ratio, and return on asset, all measured at about one month prior to the loan disbursement. The model is estimated with bank fixed effects and time fixed effects. Robust standard errors adjusted for clustering of residuals by banks are in parentheses, and ***, **, * indicates statistical significant at the 1%, 5%, and 10% level, respectively.

	(1) 4-week return	(2) 4-week return	(3) 1-week return	(4) 2-week return	(5) 13-week return
Stock Return (4 weeks)	**0.0267***** **(0.00887)**	**0.0218**** **(0.00834)**			
Stock Return (1 week)			**0.0349**** **(0.0143)**		
Stock Return (2 weeks)				**0.0199**** **(0.00997)**	
Stock Return (13 weeks)					**0.00886** **(0.00938)**
Stock Return (4 weeks ahead)		0.0108 (0.00825)			
NPL Ratio	**-45.48*** **(24.10)**	**-46.46*** **(23.83)**	**-54.60**** **(27.55)**	**-50.99*** **(26.61)**	**-50.16*** **(27.38)**
Ln (undrawn)	0.893 (0.612)	0.872 (0.613)	0.889 (0.630)	0.880 (0.613)	0.864 (0.601)
Equity Ratio	1.742 (9.218)	0.850 (9.159)	-1.666 (9.910)	3.815 (9.173)	0.133 (9.379)
Core Deposit Ratio	7.867 (5.784)	7.684 (5.862)	7.846 (5.824)	7.774 (5.742)	7.094 (5.799)
Liquid Asset Ratio	7.386 (5.778)	3.850 (4.857)	6.549 (5.728)	7.110 (5.729)	6.673 (5.710)
Return on Asset	-42.04 (33.46)	-47.30 (33.67)	-39.29 (33.59)	-42.08 (33.54)	-44.16 (31.28)
Aug 2007	0.763** (0.362)	0.685* (0.359)	0.544* (0.324)	0.577* (0.345)	0.510 (0.349)
Nov 2007	0.866** (0.422)	0.745* (0.432)	0.779* (0.416)	0.600 (0.395)	0.559 (0.380)
Feb 2008	0.434 (0.419)	0.737* (0.379)	0.434 (0.429)	0.409 (0.396)	0.732* (0.432)
May 2008	0.789* (0.411)	0.901** (0.436)	0.832* (0.427)	0.813* (0.421)	0.813* (0.425)
Aug 2008	0.341 (0.416)	0.336 (0.400)	0.645 (0.441)	0.639 (0.437)	0.865* (0.452)
Nov 2008	1.133** (0.450)	1.167** (0.458)	0.575 (0.451)	0.991** (0.454)	0.895* (0.463)
Constant	-14.28 (15.44)	-12.83 (15.38)	-13.64 (15.75)	-14.08 (15.41)	-12.85 (15.25)
Observations	682	680	682	682	682
# Banks	120	120	120	120	120
R-squared	0.057	0.058	0.047	0.046	0.044

Table IV: Takedown volumes by loan categories

The panel regression model with bank fixed-effect is specified as follows:

$$Ln(\text{Takedown}_{i,t}+1) = \beta_1 * \text{Stock Return}_{i,t} + \beta_2 * NPL_{i,t} + \beta_3 * Ln(\text{Undrawn}_{i,t}+1)$$
$$+ \text{B} * \text{Bank Controls}_{i,t} + \text{Bank Fixed Effect}_i + \text{Time Fixed Effect}_t + \text{constant}$$

The dependent variable is the log of weekly takedown volume under precommitted credit lines, by different loan categories, including, lower risk loans (based on internal credit rating) vs. higher risk loans, long relationship borrowers (greater than 1 year) vs. short relationship borrowers, large commitment size (greater than $10 million) vs. small lines, and large loans (greater than $0.5 million) vs. small loans. Bank stock returns are measured relative to four weeks ago. A second measure of bank distress is the bank's nonperforming loan ratio about one month ago. Also controlled for are, unused portion of loan commitments, equity ratio, core deposit ratio, liquid asset ratio, and return on asset, all measured at about one month prior to the loan disbursement. The model is estimated with bank fixed effects and time fixed effects. Robust standard errors adjusted for clustering of residuals by banks are in parentheses, and ***, **, * indicates statistical significant at 1%, 5%, and 10% level, respectively.

	(1) Low risk	(2) High risk	(3) Long relation	(4) Short relation	(5) Large line	(6) Small line	(7) Large loan	(8) Small loan
Stock Return	0.00880	**0.0228****	-0.00237	**0.0231****	-0.00643	**0.0221****	0.00486	**0.0271*****
	(0.0101)	**(0.0106)**	(0.0104)	**(0.00886)**	(0.00891)	**(0.00931)**	(0.0125)	**(0.00891)**
NPL Ratio	-20.20	**-51.40***	-23.33**	**-49.44****	-1.429	**-49.69****	-4.756	**-45.96***
	(13.68)	**(27.49)**	(11.34)	**(23.80)**	(10.99)	**(25.04)**	(12.16)	**(24.26)**
Ln (undrawn)	0.821	1.312	0.909	0.640	-0.0639	0.266	0.904	0.626
	(0.566)	(1.265)	(0.678)	(0.565)	(1.275)	(0.452)	(0.912)	(0.497)
Equity Ratio	9.008	17.66	-10.21	7.164	41.44**	-10.48	19.29	-3.759
	(14.22)	(21.42)	(15.32)	(9.224)	(19.80)	(12.90)	(20.64)	(9.318)
Core Deposit Ratio	4.218	3.220	5.593	7.175	0.865	8.717	11.49	6.485
	(6.007)	(7.158)	(6.267)	(6.153)	(5.125)	(6.787)	(7.072)	(5.285)
Liquid Asset Ratio	7.460	-2.392	-0.632	5.209	-0.580	8.807	2.906	4.668
	(5.755)	(9.089)	(4.419)	(5.912)	(5.383)	(6.359)	(7.606)	(4.533)
Return on Asset	-45.27	-70.34	-40.52	-43.06	3.407	-40.16	0.954	-48.05
	(44.87)	(50.99)	(37.06)	(33.09)	(26.45)	(33.88)	(24.20)	(31.86)
Aug 2007	0.927**	0.321	0.581	0.660*	0.102	0.666*	0.986**	0.599
	(0.410)	(0.394)	(0.374)	(0.373)	(0.311)	(0.363)	(0.432)	(0.370)
Nov 2007	0.467	0.467	0.230	0.865*	0.143	0.691*	0.721	0.821**
	(0.445)	(0.479)	(0.452)	(0.458)	(0.445)	(0.417)	(0.586)	(0.403)
Feb 2008	0.432	0.541	0.666	0.425	0.769	0.411	0.521	0.351
	(0.437)	(0.597)	(0.505)	(0.417)	(0.551)	(0.402)	(0.617)	(0.410)
May 2008	0.475	0.289	0.877**	0.865*	0.956*	0.654*	1.181**	0.587
	(0.383)	(0.420)	(0.427)	(0.445)	(0.505)	(0.389)	(0.514)	(0.403)
Aug 2008	0.397	0.660	1.257***	0.399	0.961**	0.418	1.039**	0.109
	(0.422)	(0.621)	(0.475)	(0.423)	(0.480)	(0.440)	(0.522)	(0.416)
Nov 2008	0.780**	1.005	1.279**	1.056**	0.351	1.127**	1.205*	0.918**
	(0.388)	(0.681)	(0.532)	(0.464)	(0.531)	(0.467)	(0.696)	(0.445)
Constant	-12.78	-20.85	-12.80	-9.140	3.514	-1.690	-20.95	-7.482
	(14.38)	(27.95)	(16.29)	(14.41)	(27.87)	(12.48)	(21.44)	(12.74)
Observations	654	654	682	682	682	682	682	682
# Banks	117	117	120	120	120	120	120	120
R-squared	0.023	0.050	0.038	0.055	0.024	0.051	0.021	0.059

Table V: Takedown volumes in different types of banks

The panel regression model with bank fixed-effect is specified as follows:

$$Ln(\text{Takedown}_{i,t}+1) = \beta_1 * \text{Stock Return}_{i,t} + \beta_2 * NPL_{i,t} + \beta_3 * Ln(\text{Undrawn}_{i,t}+1)$$
$$+ \text{B} * \text{Bank Controls}_{i,t} + \text{Bank Fixed Effect}_i + \text{Time Fixed Effect}_t + \text{constant}$$

The dependent variable is the log of weekly takedown volume under precommitted credit lines. The regression are estimated separately for different types of banks: higher core deposit ratio (than 0.59) banks vs. lower ratio banks, higher liquidity ratio (than 0.195) banks vs. lower ratio banks, higher equity ratio (than 0.095) banks vs. lower ratio banks, and higher total asset (than $8.155 billion) banks vs. smaller total asset banks. A bank's type is decided by the average value of over the whole sample period. Bank stock returns are measured relative to four weeks ago. A second measure of bank distress is the bank's nonperforming loan ratio. Also controlled for are, unused portion of loan commitments, equity ratio, core deposit ratio, liquid asset ratio, and return on asset, all measured at about one month prior to the loan disbursement. The model is estimated with bank fixed effects and time fixed effects. Robust standard errors adjusted for clustering of residuals by banks are in parentheses, and ***, **, * indicates statistical significant at the 1%, 5%, and 10% level, respectively

	(1) High core deposit	(2) Low core deposit	(3) High Liquidity	(4) Low Liquidity	(5) High capital	(6) Low capital	(7) Large bank	(8) Small bank
Stock Return	0.0155	**0.0316****	0.0187*	**0.0333****	0.00818	**0.0382*****	0.00477	**0.0446*****
	(0.0105)	**(0.0126)**	(0.00964)	**(0.0138)**	(0.00911)	**(0.0139)**	(0.00783)	**(0.0142)**
NPL Ratio	-55.74**	**0.778**	9.784	**-79.21*****	-77.95***	**-18.99**	-4.257	**-50.84***
	(27.70)	**(22.54)**	(9.522)	**(19.58)**	(21.87)	**(21.43)**	(22.33)	**(28.02)**
Ln (undrawn)	1.126	0.958	0.539	1.685	0.680	1.195	0.803	0.524
	(1.137)	(0.700)	(0.412)	(1.936)	(0.672)	(1.277)	(0.778)	(0.759)
Equity Ratio	-26.11	8.703	14.16	6.636	1.262	-8.136	4.720	-1.022
	(20.46)	(14.72)	(13.28)	(12.34)	(10.86)	(21.10)	(11.34)	(23.38)
Core Deposit Ratio	3.370	10.21	3.925	12.31	17.42**	2.951	12.33	1.482
	(6.569)	(8.134)	(5.580)	(10.72)	(8.463)	(7.283)	(9.507)	(6.009)
Liquid Asset Ratio	-6.688	21.93**	13.28*	0.609	-2.445	17.44*	2.475	11.10
	(6.503)	(10.01)	(7.650)	(9.956)	(5.250)	(10.38)	(5.115)	(11.83)
Return on Asset	-4.967	-51.05	-22.48	-49.94	15.42	-68.16	-7.292	-65.85
	(45.83)	(42.89)	(36.92)	(37.49)	(29.49)	(50.40)	(24.36)	(58.53)
Aug 2007	0.205	1.039**	0.935*	0.571	0.315	0.924	0.361	0.899
	(0.511)	(0.454)	(0.483)	(0.536)	(0.393)	(0.568)	(0.388)	(0.615)
Nov 2007	0.157	1.127*	1.140**	0.473	0.440	1.041*	0.267	1.206*
	(0.609)	(0.566)	(0.550)	(0.565)	(0.488)	(0.604)	(0.485)	(0.662)
Feb 2008	0.446	0.0291	0.257	0.475	0.545	0.235	0.446	-0.00327
	(0.686)	(0.504)	(0.614)	(0.627)	(0.481)	(0.631)	(0.546)	(0.643)
May 2008	0.499	0.711	0.713	0.758	1.458***	0.132	0.691	0.544
	(0.539)	(0.571)	(0.475)	(0.533)	(0.538)	(0.580)	(0.562)	(0.575)
Aug 2008	0.0533	0.0839	0.260	0.341	1.117**	-0.459	0.258	-0.00974
	(0.694)	(0.399)	(0.443)	(0.548)	(0.495)	(0.582)	(0.494)	(0.580)
Nov 2008	0.910	0.550	0.704	1.558***	1.732***	0.462	0.591	0.960*
	(0.650)	(0.517)	(0.427)	(0.568)	(0.478)	(0.559)	(0.540)	(0.551)
Constant	-11.33	-19.96	-9.170	-31.14	-12.84	-20.33	-12.79	-5.718
	(23.16)	(19.45)	(10.08)	(45.98)	(18.12)	(28.44)	(21.71)	(17.42)
Observations	332	350	354	328	350	332	362	320
# Banks	60	60	60	60	60	60	60	60
R-squared	0.096	0.074	0.042	0.127	0.103	0.082	0.032	0.113

Table VI: Bank financial conditions do not affect the quantity of newly negotiated loans (spot loans, informal credit lines, recently negotiated facilities)

The panel regression model with bank fixed-effect is specified as follows:

$$Ln(\text{Takedown}_{i,t}+1) = \beta_1 * \text{Stock Return}_{i,t} + \beta_2 * NPL_{i,t} + \beta_3 * Ln(\text{Undrawn}_{i,t}+1)$$
$$+ \text{B} * \text{Bank Controls}_{i,t} + \text{Bank Fixed Effect}_i + \text{Time Fixed Effect}_t + \text{constant}$$

Dependent variables are logs of weekly new loan volumes, by different loan types, including spot loans, loans disbursed from informal credit lines, loans disbursed from formal credit lines initiated or renewed in the same or previous week, and total loan volumes summing all of the above categories as well as loans disbursed from formal credit lines. Bank stock returns are measured relative to four weeks ago. A second measure of bank distress is the bank's nonperforming loan ratio. Also controlled for are, unused portion of loan commitments, equity ratio, core deposit ratio, liquid asset ratio, and return on asset, all measured at about one month prior to the loan disbursement. The model is estimated with bank fixed effects and time fixed effects. Robust standard errors adjusted for clustering of residuals by banks are in parentheses, and ***, **, * indicates statistical significant at the 1%, 5%, and 10% level, respectively

	(1) Spot loans	(2) Informal credit lines	(3) New credit lines	(4) Total loans
Stock Return	**0.0128**	**-0.00471**	**-0.00567**	**0.00302**
	(0.00860)	**(0.00881)**	**(0.0135)**	**(0.00294)**
NPL Ratio	**19.10**	**-8.910**	**-25.79**	**-10.84**
	(11.94)	**(18.87)**	**(17.28)**	**(6.970)**
Ln (total loans)	1.011			
	(1.091)			
Ln (undrawn)		-0.256	0.800	0.240
		(0.365)	(0.613)	(0.207)
Equity Ratio	-11.16	11.55	25.65	4.977
	(25.18)	(16.16)	(26.94)	(5.363)
Core Deposit Ratio	4.779	-2.413	1.637	0.886
	(10.17)	(6.488)	(7.270)	(1.372)
Liquid Asset Ratio	-9.151	1.626	2.759	0.744
	(9.058)	(6.319)	(6.205)	(2.044)
Return on Asset	-34.28*	-0.719	-22.90	-3.582
	(20.34)	(66.27)	(42.90)	(6.311)
Aug 2007	0.221	-0.694	-0.278	0.268**
	(0.383)	(0.525)	(0.575)	(0.105)
Nov 2007	-0.194	-0.411	-0.190	0.121
	(0.479)	(0.712)	(0.660)	(0.100)
Feb 2008	-0.330	0.0552	0.0954	0.0669
	(0.417)	(0.730)	(0.630)	(0.136)
May 2008	-0.412	0.405	0.290	0.323***
	(0.568)	(0.523)	(0.561)	(0.118)
Aug 2008	-1.126*	-0.771*	0.870	0.0852
	(0.590)	(0.421)	(0.686)	(0.155)
Nov 2008	-1.457**	-0.127	0.530	0.325*
	(0.631)	(0.621)	(0.645)	(0.174)
Constant	-4.904	9.270	-9.633	10.23**
	(17.68)	(8.581)	(13.39)	(4.222)
Observations	682	682	682	682
# Banks	120	120	120	120
R-squared	0.024	0.022	0.015	0.042

Table VII: Information on individual loans

Panel A: Interest rate and loan size

The loan level data are from the Survey of Terms of Business Lending (STBL). Nominal interest rate is the compounded annual (360 days) interest rate charged on a loan. Credit spread is the nominal interest rate over the yield on treasury securities of similar repricing intervals. Loan size is the value of the loan disbursement. Commitment is the size of the credit limit on a credit line facility.

	N	Mean	S.Dev.	25th	Median	75th	95th
Precommitted Formal Lines							
Nominal interest rate	177,017	6.24	1.78	4.92	6.00	7.58	9.25
Credit spread	177,017	3.73	1.14	3.01	3.75	4.34	5.66
Loan size ($000)	177,017	353	3,122	16	43	148	1,014
Commitment ($000)	177,017	8,551	235,719	500	2,000	7,000	30,000
New Formal Lines							
Nominal interest rate	12,340	6.67	1.78	5.25	6.50	8.00	9.50
Credit spread	12,340	4.09	1.28	3.33	3.95	4.83	6.25
Loan size ($000)	12,340	724	3,485	22	61	225	2,964
Commitment ($000)	12,340	5,448	113,925	96	500	3,000	20,000
Informal Lines							
Nominal interest rate	11,006	6.54	1.73	5.00	6.50	8.00	9.25
Credit spread	11,006	3.88	1.12	3.31	3.87	4.47	5.57
Loan size ($000)	11,006	146	697	13	30	91	450
Commitment ($000)	11,006	3,460	7,822	400	1,400	4,000	14,286
Spot Loans							
Nominal interest rate	12,491	7.10	1.89	6.00	7.00	8.25	10.25
Credit spread	12,491	4.19	1.60	3.28	4.04	5.18	6.58
Loan size ($000)	12,491	974	6,893	12	30	122	2,500

Panel B: Loan characteristics by categories

Share of total	Precommitted Formal Credit Lines	New Formal Credit Lines	Informal Credit Lines	Spot Loans
Secured Loans	0.82	0.77	0.90	0.79
Fixed Rate Loans	0.06	0.18	0.11	0.35
Maturity > 1 year	0.48	0.53	0.64	0.76
No stated maturity	0.22	0.15	0.45	0.33
Non-rated loans	0.02	0.03	0.03	0.13
Rating=1	0.01	0.02	0.02	0.02
Rating=2	0.06	0.07	0.06	0.15
Rating=3	0.33	0.37	0.29	0.42
Rating=4	0.24	0.26	0.21	0.17
Rating=5	0.06	0.07	0.10	0.02
Rating Missing	0.28	0.19	0.30	0.08
N	177,017	12,340	11,006	12,491

Table VIII: Loan level regressions: Bank financial conditions affect credit spreads on newly negotiated loans (spot loans, loans from informal credit lines, loans from newly initiated credit lines), but not loans disbursed from precommitted formal credit lines

The regression is specified as follows:

$$Spread = \beta_1 * \text{Stock Return}_{i,t} + \beta_2 * NPL_{i,t} + \Lambda * \text{Loan Controls}$$

$$+ \text{B} * \text{Bank Controls}_{i,t} + \text{Time Fixed Effect}_i + \text{constant}$$

Credit spread (%) is measured as effective nominal interest rates over yields on treasury securities of similar repricing intervals. Loan controls include log of loan size, log of loan commitment size, dummy variables for secured loans, for loans with maturity greater than one year, for loan without a stated maturity, and for fixed rate loans. Loan risks are controlled for with dummy variables for non-rated loans (in banks that do rate loans), dummy variables for loans with an internal risk rating of 2 through 5, respectively, and a dummy variable for loans that are not rated because the banks do not rate loans. Loans with a risk rating of 1 are used as the benchmark and a dummy variable for them is not included. Bank performance is measured using four-week bank stock return, and non-performing loan ratio one month ago. We further control for bank characteristics using financial ratios such as equity ratio, core deposit ratio, liquidity ratio, and return on assets. We also control for log of total commercial loans outstanding. Time fixed effects are included and all standard errors are adjusted for the clustering of residual by banks. ***, **, * indicates statistical significant at the 1%, 5%, and 10% level, respectively

	(1) Formal lines	(2) New formal lines	(3) Informal lines	(4) Spot loans
Stock Return	0.00100	0.00213	0.00267	0.00371
	(0.00258)	(0.00352)	(0.00416)	(0.00673)
NPL Ratio	**-0.377**	**17.11****	**17.07*****	**13.96****
	(5.961)	**(8.505)**	**(6.322)**	**(6.057)**
Ln (Loan)	0.0252	-0.000834	-0.0809***	-0.360***
	(0.0252)	(0.0250)	(0.0149)	(0.0318)
Ln (Commitment)	-0.323***	-0.242***	-0.268***	
	(0.0317)	(0.0299)	(0.0394)	
Secured	-0.0236	-0.0487	0.133	-0.292
	(0.0863)	(0.0728)	(0.0834)	(0.242)
Maturity> 1 yr	0.0944	0.0613	-0.0477	0.414***
	(0.0967)	(0.100)	(0.0619)	(0.135)
No stated maturity	-0.242	-0.0178	-0.476***	-0.243
	(0.165)	(0.179)	(0.107)	(0.196)
Fixed rate	-0.601***	-0.780***	-0.760***	-0.526***
	(0.131)	(0.102)	(0.120)	(0.120)
Non-rated	0.594***	0.641***	-0.316	0.554**
	(0.207)	(0.212)	(0.199)	(0.226)
Rating=2	0.163	0.294	0.318**	0.267*
	(0.216)	(0.201)	(0.124)	(0.150)
Rating=3	0.472**	0.670***	0.149	0.683***
	(0.221)	(0.155)	(0.121)	(0.117)
Rating=4	0.462**	0.713***	0.351**	0.595***
	(0.211)	(0.159)	(0.168)	(0.183)
Rating=5	0.919***	1.109***	0.402	1.079***
	(0.233)	(0.180)	(0.256)	(0.139)
No rating system	0.305	0.643***	0.445	0.439*
	(0.188)	(0.179)	(0.307)	(0.236)
Equity Ratio	-3.283	1.911	5.092**	-3.130
	(2.495)	(3.270)	(1.908)	(3.629)

Core Deposit Ratio	1.181	-0.160	-4.761***	0.825
	(0.743)	(0.524)	(1.225)	(1.053)
Liquid Asset Ratio	-0.714	-0.253	-0.366	-1.602***
	(0.600)	(0.718)	(1.274)	(0.601)
Return on Asset	-5.352	8.243	-0.397	2.004
	(3.229)	(5.703)	(6.571)	(7.644)
Ln (total loan)	-0.0689*	-0.0675*	-0.149***	-0.0506
	(0.0389)	(0.0343)	(0.0460)	(0.0402)
Aug 2007	-0.109**	-0.158**	0.166	0.00379
	(0.0419)	(0.0761)	(0.127)	(0.151)
Nov 2007	0.235***	0.147*	0.297**	0.453***
	(0.0456)	(0.0831)	(0.120)	(0.0935)
Feb 2008	0.243***	0.0742	-0.100	0.443***
	(0.0716)	(0.129)	(0.214)	(0.146)
May 2008	-0.0335	-0.163	-0.508**	0.248
	(0.0896)	(0.119)	(0.242)	(0.177)
Aug 2008	-0.201*	-0.406***	-0.722***	0.00888
	(0.119)	(0.149)	(0.205)	(0.264)
Nov 2008	0.537***	0.260	0.0317	0.707***
	(0.150)	(0.206)	(0.165)	(0.223)
Constant	8.631***	7.522***	12.85***	8.170***
	(0.950)	(0.685)	(1.210)	(1.348)
Observations	177,017	12,340	11,006	12,491
R-squared	0.332	0.273	0.424	0.310