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A question of liquidity: The great banking run of 2008? ¹

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Abstract

The current financial crisis has given rise to a new type of bank run, one that affects both the banks' assets and liabilities. In this paper we combine information from the commercial paper market with loan level data from the Survey of Terms of Business Loans to show that during the 2007-2008 financial crises banks suffered a run on credit lines. First, as in previous crises, we find an increase in the usage of credit lines as commercial spreads widen, especially among the lowest quality firms. Second, as the crises deepened, firms drew down their credit lines out of fear that the weakened health of their financial institution might affect the availability of the funds going forward. In particular, we show that these precautionary draw-downs are strongly correlated with the perceived default risk of their bank. Finally, we conclude that these runs on credit lines have weakened banks further, curtailing their ability to effectively fulfill their role as financial intermediaries.

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Introduction

During the 2007-2008 financial crisis we experienced a new type of bank run, one that affected both the banks' assets and liabilities. There were two important developments in the financing landscape created conditions that made this bank run possible. First, financial intermediaries have come to depend on multiple sources of short-term funding, no longer relying exclusively on deposits. While this development has reduced banks reliance on a single source of funding, it has left them vulnerable to shortages in any one of their funding sources. In the recent crisis, banks' access to short-term liquidity was severely constrained when investors lost faith in financial institutions and caused the collapse of the financial commercial paper market (henceforth financial paper⁴). The second development, which has been taking place over the past 30 years, is financial disintermediation. As a result of disintermediation, a number of firms now turn to markets, instead of banks, to meet their short-term liquidity needs. Those firms which derived funding from the commercial paper market also experienced a liquidity shock when these funds dried up, leading them to lines of credit secured with banks prior to the onset of the crisis. An uptick in the usage of credit facilities in challenging credit environments is expected and has been observed in the past. However, during the 2007-2008 crisis, there is evidence that a number of firms drew down their credit lines out of fear that the weakened health of their financial institution might affect the availability of the funds going forward. The traditional definition of a bank run is that of depositors rushing to withdraw their deposits because they doubt a bank's survivability. The mechanism at play during the 2007-2008 crisis is very similar to that of a run on the bank by depositors in the sense that the run is motivated by fear about the institution's health rather than by the counterparty's (whether a firm, a depositor or a CP investor) need for cash. The run on the financial paper market which in turn led to a run on the credit lines by firms weakened banks even further and curtailed their ability to effectively fulfill their role as financial intermediaries.

Bank runs – a historical perspective

The notion that a systemic bank run could occur in a modern economy is usually dismissed as a thing of the past. Even though bank panics were a regular occurrence throughout the 19th century and at the beginning of the 20th, the US has not experienced one in the past 70 years. Bank panics led to large scale bank closures and were often followed by severe economic downturns. For example, during the 1837 panic out of 850 banks, 343 closed entirely and 62 failed partially⁵. The last and most well known, systemic bank run was during the Great Depression and resulted in the adoption of a number of policy changes that re-established the

⁴ In order to differentiate commercial paper issued by financial institutions from commercial paper issued by non-financial institutions we will use the term financial paper to refer to the former and commercial paper for the latter.

⁵ The Great Republic By the Master Historians Vol. III, ed H. Bancroft, 1902

public's confidence in the banking sector. Deposit insurance, which eliminates virtually all risk for average depositors, is probably the most significant tool that emerged in the aftermath of the 1930s banking crisis. Although individual bank failures are still a reality, the protection that depositors enjoy through deposit insurance programs has been successful at preventing widespread panics and the ensuing herd behavior that leads to runs on both healthy and unhealthy banks. The safeguards put in place to protect the banking system have been so successful that banks are now seen as safe havens in times of financial uncertainty. Strahan and Gatev (2006) show that banks experience funding inflows when market liquidity dries up and commercial paper spreads widen. This increase in deposits allows banks to provide additional liquidity to borrowers in times of financial distress; typically these additional funds are able to offset the increase in draw-downs on pre-existing lending commitments.

Liquidity financing in the new financial intermediation landscape

Over the past decades, financial disintermediation has diminished the prevalence of banks in favor of financial markets as a source of short term financing to large companies. Firms used to open revolver loans (also referred to as lines of credit or pre-existing commitments) at financial institutions to satisfy their liquidity needs. With the development of the commercial paper market in the 80s and especially in the 90s, firms have increasingly relied on commercial paper, generally a cheaper alternative, to meet their liquidity needs in normal times. However, this increased reliance on commercial paper has not eliminated the need for revolvers but rather changed the firms' motivation when underwriting them. Firms now choose to pay the fees that banks charge on the unused portions of the revolvers to keep the credit facility as an insurance against a market-wide decline in liquidity⁶. Banks were thought to be ideally positioned to provide liquidity insurance through revolvers because of the influx of deposits they experience as investors seek a safe haven for their wealth.

The changing definition of a bank

The deregulation of the financial intermediation industry that took place over the past 30 years and culminated in 1999 with the repeal of the Glass-Steagall Act led to the creation of universal banks engaging in diverse types of financial activities. Interestingly, a number of financial institutions, in particular investment banks, which have been very active in structured finance, typically do not have any kind of deposits. These institutions did not attract the same regulatory scrutiny as the more traditional commercial banks precisely because they did not have deposits. This is the legacy of an obsolete mindset shaped by the Great Depression and the separation of banking activities by the Glass-Steagall Act. It is very telling that most academic research on

⁶ Beyond a firms' desire to insure itself against a liquidity shortage, credit rating agencies require firms issuing commercial paper to maintain back-stop lines of credit as liquidity protection to the event that the firm cannot roll-over the commercial paper.

bank runs has focused exclusively on runs by depositors. Banks, however, have become progressively more reliant on markets as short term funding sources, such as the financial paper market, exposing them to new sources of liquidity risk. The existing safeguards, designed to avert traditional bank runs, proved to be insufficient to address the problems that emerged during the current crisis.

A new type of bank run

Even though banks did experience an influx of deposits during the 2007-2008 crisis, their weakened position was aggravated by their dependence on the financial paper market. The freezing of the commercial paper market this time around affected both financial and non-financial issuers significantly straining short term funding sources for both types of firms. As in previous illiquidity episodes, a first round of draw-downs on revolvers occurred as non-financial firms turned to banks as their “liquidity provider of last resort”. However, as firms were turning to banks for liquidity an important source of liquidity for a large number of financial institutions became unavailable. Consequently, strains in banks’ balance sheets became more apparent which in turn triggered a second wave of precautionary draw-downs by firms rushing to secure liquidity.

Information uncertainty and market disruptions

Well functioning markets rely on the quality of the available information and investors’ ability to correctly translate it into prices. When the available information is unreliable we move from a world where risk is present, but quantifiable, to one of uncertainty in the Knightian sense of the term, i.e. where probabilities cannot accurately be assigned to events. In the face of uncertainty, markets cannot operate efficiently since investors are unable to quantify their exposure to risk. As Stiglitz and Weiss (1981) have shown, an increase in opaqueness aggravates adverse selection problems which can result in credit rationing. There have been other instances of disruptions on the liquidity market in the past. The last one, prior to the current crisis, was in 2001 following the accounting scandals at Enron, WorldCom and other highly regarded firms whose performance proved to have been exaggerated through creative accounting practices. The commercial paper market disruption that resulted at that time has similarities with the current crisis, particularly in regards to the loss of confidence in asset class ratings. The rating agencies’ inability to identify the problems any sooner than the market, highlighted by the fact that Enron maintained its investment grade rating until the very end, shook investors’ confidence in the ratings. The ensuing increase in uncertainty led to a significant decline in outstanding commercial paper. There is, however, an important difference between the 2001 and the current market disruption. The decline in 2001 was mostly concentrated in the issuance of non-financial commercial paper and did not meaningfully affect

the financial paper market. Consequently, as firms turned to their revolvers to meet their liquidity needs, banks still had the ability to issue financial paper.

Commercial and financial paper market disruption in 2007-2008

During the current crisis, in contrast to past commercial paper disruptions, the main victims of the liquidity dry-up were financial firms. The uncertainty revolved around the ratings of the Asset Backed Commercial Paper (ABCP) tranches and the estimation of the expected delinquency rates in the underlying portfolios. In the summer of 2007 the ABCP market suffered a drop in volume of more than 30% (Figure 1), while at the same time the unsecured financial paper market only suffered a temporary drop and the commercial paper market was barely affected. The relatively small drop and subsequent recovery of the financial paper volume in 2007 is very interesting because it suggests that in the early stages of the crisis, investors did not consider the health of the financial system as a whole to be at risk. Only subprime related assets, such as the vast majority of securitized assets underlying ABCP, were deemed toxic. A year later, when Lehman Brothers declared bankruptcy in September 2008, it became apparent that the crisis was spreading to other financial institutions, whether exposed to subprime mortgages or not. Uncertainty in the financial markets was at its height following the collapse; accordingly investors shied away from all financial paper. During this period, from September 17 to October 22, the volume of outstanding FP dropped by 238 billion (30% of the market) while ABCP outstanding decreased by another 72 billion. The non-financial CP market and the lower rated paper in particular, also suffered this time around. In response, the Federal Reserve put in place liquidity facilities in an attempt to prop up the commercial paper market. However, these programs only accepted higher rated paper as collateral. In Figure 2 it can be observed that the spread between the financial and the commercial paper increased substantially in late 2007 and exploded in 2008 with financial paper commanding rates more than 200 basis points higher than commercial paper rates. The different reactions, in terms of volume and interest rates, in the short-term paper markets are crucial in understanding the root causes of this bank run.

In the following sections, combining commercial paper market information with loan level data from the Federal Reserve Board of Governors Survey of Terms of Business Lending⁷, we provide empirical support to the bank run thesis.

Increased usage of credit lines: Round 1

Starting in July 2007, the higher commercial paper rates triggered a first round of draw downs on revolvers. Firms took advantage of a cheaper source of financing given the lower spreads

⁷ Quarterly data from 2003-Q2 to 2008-Q4, containing 672,000 loans (new loans and loans made under an existing commitment), corresponding to 435 financial institutions. Call Report data for bank level variables has been used.

over LIBOR on their credit lines the terms of which had been set before the crisis⁸. This increase in draw downs when non-financial commercial paper spreads widen is consistent with what happened in previous illiquidity episodes (Strahan and Gatev, 2006). That is, a first order effect on the increased use of lines of credit is due to a substitution of CP financing by bank borrowing mainly because of a differential in the cost of funds. Our statistical analysis of loan data shows that for each basis point increase in the CP rates it is 3 percent more likely that a bank makes a loan under an existing commitment than a new loan. This effect is only significant for big loans (greater than \$1 million) because only the bigger companies use CP and are the ones substituting CP financing with bank financing. Our analysis also confirms that firms drawing down their credit lines benefited from significantly better loan rates than firms obtaining new loans, after controlling for borrower and lender quality⁹. Specifically, as can be seen in Figure 3, the differential spread between new loans versus loans under commitment was 85 basis points, on average, in November 2008. When markets are liquid and credit is abundant this spread is even negative (about minus 20 basis points, on average, in 2006). To put this in perspective, between 2001 and 2003 the largest spread difference recorded was of about 50 basis points. Banks find themselves obligated to honor these large commitments which were negotiated prior to the crisis when, as a result of the abundance of liquidity, credit standards were fairly lax. At the same time, deposits at commercial banks increased substantially and the financial paper market was functional, albeit with significantly higher rates than usual¹⁰. Lines of credit, at first, fulfilled their role as liquidity insurance.

Increased usage of credit lines: Round 2

As the crisis deepened, however, banks' balance sheets were further weakened by successive write downs and increasing delinquencies across all loan portfolios. As mentioned earlier, the Lehman bankruptcy sparked a collapse of the financial paper market and a spike in the rates on both the financial and commercial paper, although the increase was significantly more pronounced for FP rates. This spike in rates made draw-downs on revolvers even more attractive to firms while banks found themselves struggling to secure liquidity. This uncertainty led to a second round of draw-downs by firms, which we label "precautionary" draw-downs. Being uncertain about their financial institutions' ability to provide the funds as promised under a credit line agreement, some firms preventatively drew their lines down. This is particularly the

⁸ The empirical analysis consists on a probit regression of the probability that a loan extended by a bank is made under an existing commitment versus new loan. As explanatory variables, we include the CP spread for non-financial firms (AA Non-financial firms CP interest rate minus 3-month Treasury bill). We also include several bank level characteristics like total assets, profitability capitalization and liquidity. More importantly, we control for the level of deposits and unused commitments.

⁹ Differences in differences spreads between new loans and commitment loans. Average spreads are computed by bank, rating and loan type (new vs. commitment).

¹⁰ Federal Reserve Statistical Release. H.8. Assets and Liabilities of Commercial Banks in the United States.

case among poorly rated companies that drew down their lines out of fear that their banks might cut their credit lines. Even when there is no fear about the survivability of the financial institution, if the bank actively manages credit lines (decrease the unused amount) firms will draw down their lines in an attempt to pre-empt the bank's actions. Anecdotal evidence such as the following report on Ford's announcement to tap into its credit line, confirms the idea of precautionary draw downs.

Drawing on the credit line will give Ford access to \$10.1 billion in cash by next week, and erases any chance that the money wouldn't be available later should lending conditions tighten, Chief Financial Officer Lewis Booth said in an interview at Ford headquarters in Dearborn, Michigan. "We are not tapping the revolver to fund operations. We are not tapping the revolver to stay above minimum cash levels," Booth said. "We are doing it to ensure that it's there." The move exhausts Ford's available borrowing under the revolver, Booth said.¹¹

In order to test this hypothesis we used Credit Default Swap prices for the largest banks in our sample as a measure of how stressed the bank is perceived to be by the market. After controlling for other parameters, we found that banks with high CDS prices experienced significantly higher draw downs than banks with lower ones. In other words, when a bank was thought to be at high risk of default, firms that had credit lines with them were more likely to use them than if their credit line was with a healthier bank. This was a run on the banks by investors who ran away from the financial paper market which in turn triggered a run by borrowers of the weakest banks. This sequence of events was made possible by the combination of an increased reliance on the commercial paper market by financial institutions for their short term liquidity needs and the, often lax, underwriting of credit lines during the good years.

Flight to quality during the 2007-2008 financial crises

Our analysis also compares the quality of borrowers that use lines of credit to the quality of new borrowers during the crisis. We find that borrowers utilizing existing lines of credit crowd out the good quality borrowers. A flight to quality can clearly be observed in new loans with the share of higher quality loans (ratings 1 and 2) jumping from about 10% in early 2007 to close to 30% in late 2008, as the share of lower quality loans declined from about 30% to 25% over the same time period. The same cannot be said of the distribution of existing unsecured commitments where no clear pattern is observed and the shares seem to remain fairly stable until the 3rd quarter of 2008 when we observe a weak flight to quality. Our regression analysis controls for observable borrower and lender quality confirms these results. We show that new

¹¹ The Wall Street Journal, January 29, 2009: "Ford Posts Quarterly Loss of \$5.9 Billion"

loans are of significantly higher quality during the recession period than loans extended under existing commitment. Ivashina and Scharfstein (2008) also document an increase in the draw downs during the 2007-2008 crises, especially among lower quality firms.

Lines of credit: a desirable liquidity insurance tool or an inefficient outcome?

One could perceive the increased use of credit lines as a positive sign in that it led to a significant increase in total lending and allowed firms to obtain liquidity when more in need. We conclude that the benefits are not that clear because draw-downs have led to a significant decrease in new lending and a potential misallocation of resources, thereby hurting the overall economy. Distressed or near-distressed firms that have suffered the most from the downturn are the least likely to be able to tap into the commercial paper market or obtain new loans, at least at reasonable spreads. Indeed, the CP market for lower rated firms saw the most dramatic rate increases. Furthermore, the low quality borrowers cannot rely on the liquidity facilities of the Federal Reserve which were designed only for higher credit rated borrowers. However, lower quality firms can use the lines of credit that they negotiated prior to the crisis at significantly better terms when credit standards were lax. Banks find themselves lending to these businesses at spreads that no longer reflect the risk they are exposed to. These “forced” loans crowd-out new loans to either lower risk businesses or to equally risky businesses but with spreads that better reflect their financial health.

In light of this inefficient use of credit lines in the 2007-2008 crisis, one may call into question whether the current regulatory framework is appropriate to deal with situations of market illiquidity. In particular, regulators may need to reconsider the regulation on bank capital requirements for off-balance sheet items such as unused commitments, and more generally, strengthen prudential oversight of liquidity risk management.

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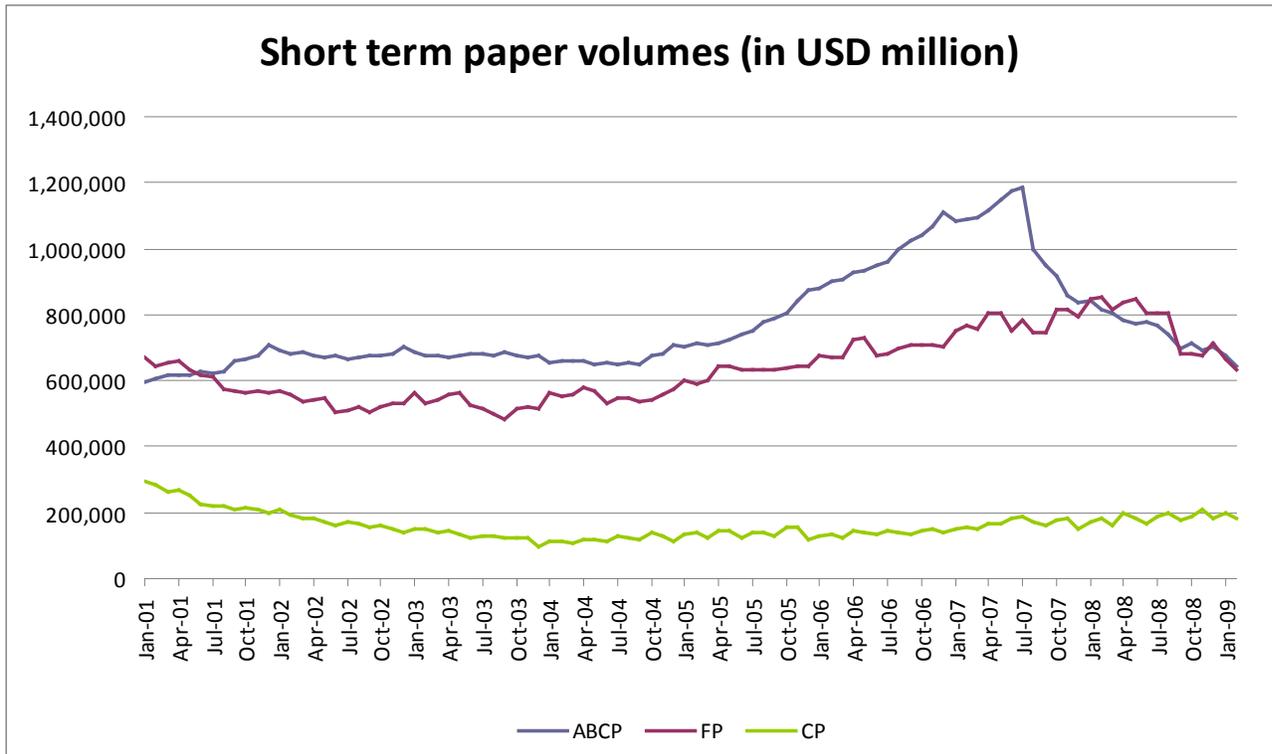
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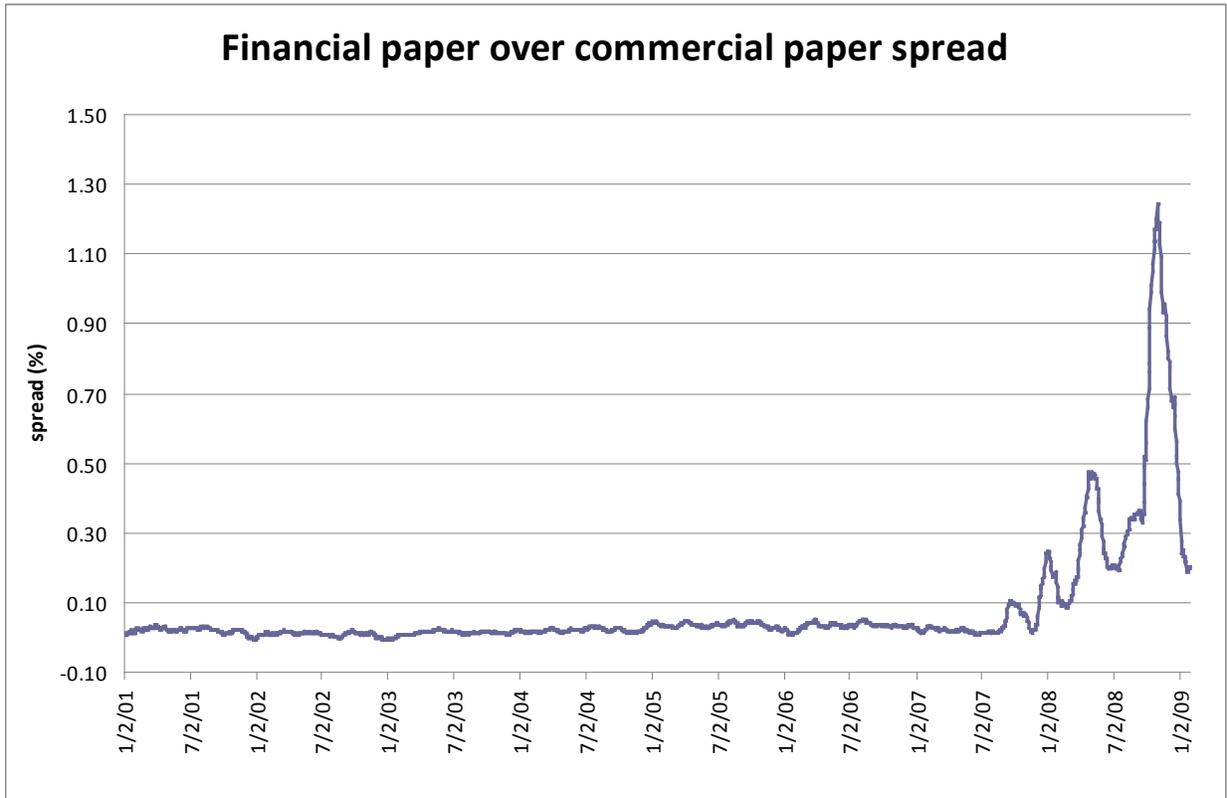
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Figure 1 – Short term paper volume.



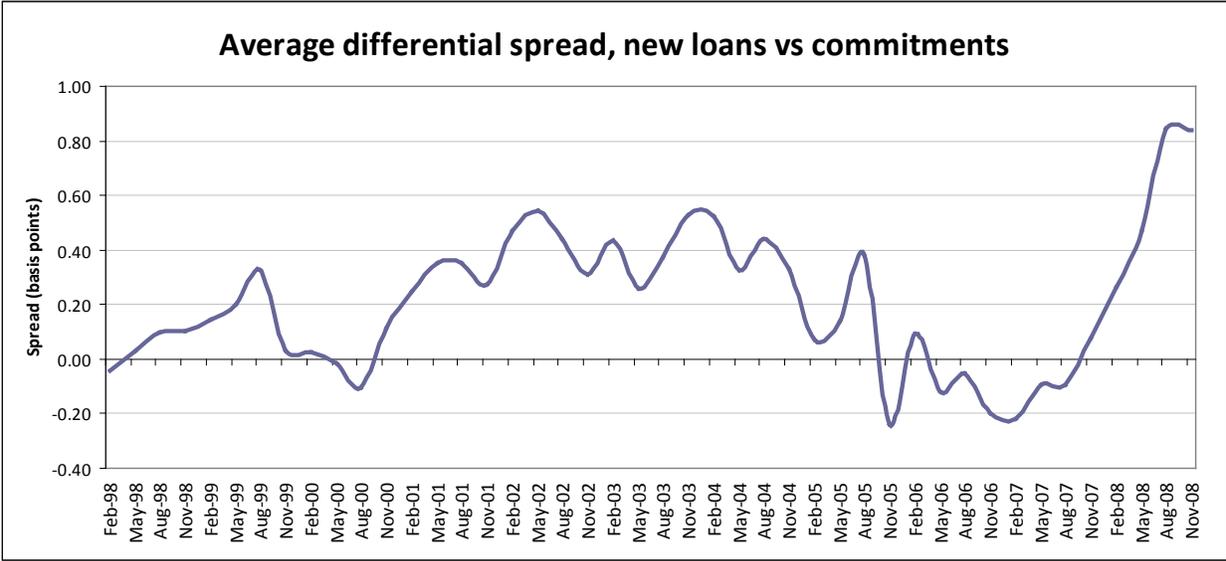
Notes: Volumes of Asset Backed Commercial Paper, Financial Paper (Commercial paper issued by financial institutions), and Commercial Paper in millions of dollars. Source: Federal Reserve. Commercial paper statistical release. <http://www.federalreserve.gov/releases/cp/>

Figure 2 – Financial Paper - Commercial Paper Spread



Notes: 30 day AA financial paper over 30 day AA commercial paper (30 day moving average). Source: Federal Reserve. Commercial paper statistical release. <http://www.federalreserve.gov/releases/cp/>

Figure 3 – Average Spread of New Loans versus Loans Under Commitment



Notes: Average differential spread new loans versus loans under commitment. Quarterly data. Source: Author’s calculations using the Survey of Terms of Business Terms. Federal Reserve.