Thawing frozen capital markets and backdoor bailouts: Evidence from the Fed's liquidity programs

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A R T I C L E   I N F O

Article history:
Received 1 November 2015
Accepted 21 November 2016
Available online 7 December 2016

Keywords:
Crisis
Federal reserve
Discount window
TAF
PDCF
TSLF
Bailout
Liquidity

A B S T R A C T

During the subprime crisis, the Federal Reserve introduced several emergency liquidity programs as supplements to the discount window (DW); TAF, PDCF, and TSLF. Using data on loans to large commercial banks and primary dealers, we find that the programs were used by relatively few institutions and thus provided limited relief to banks that relied on short-term debt markets. Although usage increased after Lehman’s bankruptcy, most commercial banks avoided the DW and TAF. We also find that the programs were more often used by failed European banks than by healthy US banks, likely because these loans are expensive relative to private market funds. Our results also show that usage of PDCF and TSLF programs, while higher, was more often used by primary dealers in weaker financial position.

Published by Elsevier B.V.

“...in September [2008], after 13 months of market stress, the financial system essentially seized up and we had a system-wide crisis. Our markets were frozen, banks had pulled back very substantially from interbank lending.”

(Testimony of Hank Paulson, Treasury Secretary, to the House Committee on Financial Services on November 18, 2008.)

To provide support to banks during the subprime crisis, the Federal Reserve (Fed) introduced three new loan facilities: the Primary Dealer Credit Facility (PDCF), the Term Securities Lending Facility (TSLF) and the Term Auction Facility (TAF). Together with its discount window (DW) program, these new facilities were intended to expand the Fed’s lender of last resort (LOLR) role in a time of extreme market stress. The PDCF and TSLF were created to allow Fed loans for primary dealers, who would otherwise have had to fend for themselves in the subprime crisis. The TAF and TSLF were structured to minimize the effects of stigma, which the Fed had viewed as the main impediment to greater DW borrowing in previous downturns (Madigan and Nelson (2002)).

Extant research on DW stigma suggests that it is the reason for the historically low usage of DW loans but since the names of DW loan recipients are kept secret, it is not obvious how a healthy bank would be stigmatized by accepting a Fed loan. Perhaps the answer lies in the tendency for DW loans to be given to banks that subsequently fail, despite Bagehot (1873) dictum to lend freely in a crisis to sound banks against good collateral. Fed data reveals that hundreds of failing banks receiving DW loans for more than a year during the 1920s. Similar practices were followed in the late 1980s when 530 banks repeatedly rolled over DW loans before being shut down by the FDIC (Schwartz, 1992). Price (2012) adds the too-big-to-fail (TBTF) examples of Continental Illinois in 1984 and Penn Central in 1970 as further evidence that DW loans typically go to unhealthy banks. Boyd and Gertler (1994) describe the discount window as “a favorite tool used over the last decade to keep...
troubled large banks afloat." In this light, the decline in popularity of DW loans in the late 1980s described by Peristiani (1998), may be best thought of as the result of healthier banks' avoiding being tarred with the DW brush.

Besides the stigma associated with them, DW loans are expensive. Unlike short-term secured loans in the repo market, DW loans carry a rate higher than the Fed Funds (FF) rate. This rate differential holds for the PDCF program as well, since the PDCF program is structured identically to the DW and has the same penalty rate over the FF rate. In contrast, private market secured loans typically carry lower interest rates than their unsecured loan counterparts (Bennemblech and Bergman 2009), Fleming, Huang, and Keane (2009), and Hrung and Seligman (2015).3 Fig. A1 shows that the DW rate exceeded the repo rate by 50 to 100 basis points during most of our sample period. Thus, banks would ordinarily shun these loans in normal times, when market liquidity is sufficient. Indeed, Flannery (1996) argues that in an economy with well-developed credit markets there is no need for LOLR loans in normal times.

When capital markets are frozen in a crisis, however, the penalty rate may be a small price to pay if other funding sources have dried up. Moreover, the penalty rates on DW and PDCF loans do not apply to the TAF and TSLF, which set their interest rates via auctions. Thus, the Fed's efforts at providing liquidity in the subprime crisis may have been more successful than in previous downturns. We investigate all four Fed facilities in the subprime crisis to determine how well the programs alleviated stress in short-term capital markets and to see if these programs were more successful in avoiding the bailouts typical of past DW loans.

We analyze two frameworks to characterize the use of Fed credit facilities. The first framework views these emergency liquidity programs as potential lifelines in the financial sector when short-term debt markets are frozen ("liquidity provision" framework). This framework implies that as the crisis deepens and capital market lending dries up, more banks should use the loan programs and should borrow more money. Furthermore, the pressure should be most evident among banks that rely on short-term debt markets. Borrowing is expected to take place first via programs that do not charge a penalty rate (TAF and TSLF) and expand to costlier programs as the crisis continues. The framework predicts that these patterns should reverse as capital markets ease up.

The second framework for understanding LOLR borrowing focuses on the financial strength of the institutions (the "bailout" framework). Implicit in this analysis is the assumption that capital markets are not completely frozen and funds are available elsewhere, such as in the repo market (Gorton and Metrick, 2012) or from the Federal Home Loan Banks (FHLBs) (Ashcraft et al., 2010). The bailout hypothesis focuses on the (relatively) large incentive for weak banks to borrow from the Fed in a crisis. Weak banks may find that they face unsecured interest rates in the capital markets that are higher than the one-size-fits-all DW and PDCF rates, while healthier banks do not. All four programs lend against collateral, but if the Fed overvalues the collateral, its penalty rate may compare favorably to the unsecured rate faced by a weak bank, especially if its only unencumbered assets are of lower quality. If these conditions hold, then the LOLR programs of the recent crisis may not have been any more successful at providing liquidity to healthy financial institutions than in the past, and would have again largely served to bail out weak banks. Under the bailout framework, we should observe that healthy banks rarely borrowed from the Fed and the amounts borrowed are small relative to the funds obtained in short-term debt markets. This hypothesis reflects the view that the DW and PDCF rates are too high to be attractive to solvent banks with access to capital markets funding. While the TSLF and TAF may be more attractive to healthy banks, these programs may underwrite them if insolvent banks bid more aggressively. Thus, a second hypothesis is that borrowing should be concentrated among the weaker banks rather than widely spread throughout the financial services industry, as insolvent banks have a greater incentive to win the auctions. Lastly, the bailout framework predicts that repayment of loans, to the extent it exists, is not related to general market conditions but to the health of the individual bank that borrows.

Our sample includes large U.S. commercial banks, investment banks and foreign banks – essentially all major financial institutions permitted to borrow directly from the Fed during the crisis. Many of these large firms had both commercial and investment banking arms and, thus had access to all four programs. We focus on large firms since the new Fed programs were intended to address frozen capital markets and these banks would have been exposed to the problems in short-term debt markets. In contrast, Berger et al. (2013) analyze the same Freedom of Information Act (FOIA) data, but limit the sample to banks that submit Call Reports, thus ignoring many large firms that would have been severely affected by disruptions in repo and public bond markets. Acharya et al. (2014) also analyze large borrowers, but they restrict their analysis to the emergency facilities aimed at primary dealers (PDCF and TSLF). Finally, unlike prior research, our analysis considers both Fed facilities and those provided by the FHLB system.

We find that the Fed liquidity programs provided some relief from the financial pressures of the subprime crisis. While our multivariate analyses show that reliance on short-term debt markets is a significant factor in determining program usage, the loans from the Fed were a relatively small part of banks' short-term funding. Notably, at the peak point of borrowing, nearly 80%, i.e., the vast majority, of short-term funding continued to be supplied by capital markets. Much of the lending was to weak foreign banks, which were the largest and most frequent users of DW loans. All four programs were used more heavily after the bankruptcy filing of Lehman Brothers on September 15, 2008, but even during this period they were largely shunned by commercial banks. The programs aimed at the primary dealers, the PDCF and TSLF, were used more widely, but borrowing remained concentrated throughout the crisis even among these firms. Finally, loan prepayments were not generally motivated by better market conditions, but rather by a desire among weaker banks to avoid investor scrutiny.

Overall, our findings imply that the Fed programs increased liquidity relative to previous crises, since the PDCF, TSLF and TAF were relatively more popular than the DW. However, the amount of funding provided was small relative to the size of these banks' short-term borrowings in capital markets and many healthy banks continued to avoid the programs altogether. Of course, it is possible that the situation would have been worse if the Fed did not offer

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3 Studies that compare yields on secured and unsecured debt typically find the opposite, but this owes to endogeneity (Bennemblech and Bergman (2009)).

4 Prior to a Freedom of Information Act (FOIA) lawsuit in 2011, use of the DW was not disclosed to the public. The FOIA data, which are described in detail in the appendix, are matched by name to datasets on bank financial information, such as Compustat in our case, and to Call Reports by Berger, Bouwman, Black and Dugloz (2013). The entity matched to the FOIA name may be at a different level than the borrower. For example, Berger et al. report substantial TAF borrowing by Chase Bank USA relative to its $79 billion in assets (as of year-end 2007), but we note that this borrowing is not substantial compared to the assets of JPMorgan Chase Bank ($1.3 trillion). The former bank did not report any repo borrowing but JPMorgan Chase Bank lists $99 billion in repo debt. Both entities have lower assets than the consolidated balance sheet of JPMorgan Chase & Co. ($1.6 trillion; Compustat).

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