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The effects of government capital and liquidity support programs on bank lending: Evidence from the syndicated corporate credit market

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ABSTRACT

This study jointly evaluates the effects of the U.S. Treasury's Troubled Asset Relief Program (TARP), the Federal Reserve's Discount Window (DW), and Term Auction Facility (TAF) on bank syndicated lending during the 2007–2009 financial crisis, using a unique data set that tracks the exposure of each lender in each syndicated credit facility in each year. By comparing lending changes within a group of banks that lend to the same facility of the same firm in the same year, it eliminates the impacts of demand-side factors that often bias the results of empirical studies on bank credit supply. Overall, I find that TARP, DW, and TAF played only a marginal role in increasing bank syndicated lending. By examining lending changes at the facility-lender and firm-lender levels, this study is less prone to the reverse causality problem that is inherent in studies using bank-level data. Therefore, this study complements studies using bank-level data and provides policymakers with a balanced view on the effects of these programs.

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1. Introduction

The Federal Reserve responded aggressively to the 2007–2009 financial crisis using both traditional and non-traditional tools to provide short-term liquidity to banks and other depository institutions. In addition to encouraging banks to borrow from the discount window (DW), the Fed introduced the Term Auction Facility (TAF) in December 2007, which provided credit to depository institutions through an auction mechanism. In parallel with the Fed's liquidity programs, the U.S. Department of the Treasury launched the Troubled Asset Relief Program (TARP) in October 2008. One major component of TARP was the Capital Purchase Program (CPP), which was designed to stabilize the financial system by providing capital to financial institutions of all sizes throughout the nation. An important objective of these liquidity and capital programs was to stabilize the financial system and increase bank lending. In this study, I evaluate the effects of these programs on bank syndicated lending by taking advantage of the recently released data on the Fed's liquidity programs.

Evaluating the effectiveness of these crisis response programs has important policy implications, as it will help policymakers design more effective programs in the future by drawing lessons from past programs. Until recently, however, empirical studies have been hindered by a lack of publicly available data on the Fed's liquidity programs, as the identities of banks borrowing from the discount window were kept secret due to the concern that this information could cause a liquidity flight. Consequently, while there is a growing list of studies that examine the implications of TARP[1], none of these studies has controlled for the effects of the Fed's liquidity programs.

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[1] The U.S. Treasury began publishing periodic updates of TARP shortly after its launch.

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Following Bloomberg's Freedom of Information Act (FOIA) lawsuit, the Fed released the data on discount window lending on March 31, 2011. Additionally, the data on TAF became publicly available in December 2010, following the passage of the Dodd–Frank Act. With the availability of these data, I construct a unique data set by linking the data on DW, TAF, and TARP with a data set of bank syndicated lending that tracks the changes of each lender's lending exposure in each syndicated credit facility in each year. Using this data, I examine the effects of TARP, DW, and TAF on lending changes at both the facility-lender and firm-lender levels. Overall, I find that TARP, DW, and TAF played either no role or only a marginal role in increasing bank syndicated lending. This finding is robust to subsample analyses, and analyses that control for missing data bias.

When banks face liquidity shocks, they try to manage their liquidity needs by selling assets, reducing lending, or by borrowing in the money and capital markets. If banks can obtain funding through the Fed's liquidity programs, they will be under less pressure to raise funds through asset sales or lending cuts. Under this scenario, we would expect lower lending cuts by these banks. However, if banks simply took advantage of the Fed's liquidity programs by substituting the "cheap" funds from the Fed for more expensive private funding (Berger et al., 2014; Boyson et al., 2014), then we would see little or no effects of the federal liquidity programs on lending. My results are consistent with the second scenario[2].

This paper contributes to a growing literature that examines the effects and implications of government crisis response programs during the 2007–2009 financial crisis. Because the data on the Fed's liquidity programs were not publicly available until recently, most of these studies focus on TARP. Within this literature, Berger and Roman (2013) find that TARP recipients obtained comparative advantages, while Bayazitova and Shivdasani (2012) find that TARP increased investors' expectation of future bailouts. Among studies that are more closely related to this study, Duchin and Sosyura (2014) find that TARP banks initiated riskier loans and shifted assets toward riskier securities. Black and Hazelwood (2013) use survey data to study the origination of commercial loans by 29 TARP banks and 28 non-TARP banks, and find that large banks shifted lending to riskier loans without increasing lending. Based on a cross-sectional sample approach, Li (2013) finds that a subsample of undercapitalized TARP banks indeed increased lending over the period from 2008Q3 to 2009Q2. Montgomery and Takahashi (2014), however, argue that existing studies fail to control for pre-existing trends in loan growth. Based on a rational expectation model derived from a simplified bank balance sheet, they show that TARP banks grew assets significantly more slowly after controlling for pre-existing trends in loan growth. Nevertheless, none of these aforementioned studies controls for the effects of the Fed's liquidity programs. Because the durations of the Fed's liquidity programs overlapped the duration of TARP, many banks that participated in TARP also participated in the Fed's liquidity programs. Therefore, it is unclear whether failing to control for the effects of the Fed's liquidity programs will lead to omitted variable bias. Therefore, my study contributes to this literature by jointly considering the effects of multiple crisis response programs.

My study also complements two recent studies that use the Fed's liquidity programs data. Boyson et al. (2014) examine the use of four Fed emergency liquidity programs by large publicly traded financial institutions during the crisis. The authors conclude that while these liquidity programs had modest effects on providing liquidity to financial institutions when short-term debt markets were stressed, the added liquidity often went to insolvent institutions or institutions close to insolvency. Berger et al. (2014) examine the use of DW and TAF by U.S. commercial banks. The authors find these programs are more likely to be used by weaker small banks and healthy large banks. In addition, they find that banks receiving funds from these programs increased their aggregate lending and lending portfolios across most loan categories. Neither of these studies examines the effects of the Fed's emergency liquidity programs on bank lending at the individual loan level. The present study fills this gap by providing micro-level evidence on the effects of these programs[3].

With the exception of Duchin and Sosyura (2014), most aforementioned studies are based on data at the individual bank level. One major challenge in evaluating the effects of government programs on bank lending at the individual bank level is the difficulty in separating the effects of demand-side factors from those of supply-side factors. For instance, a bank can reduce lending because the risk of its borrowers has escalated, or because it has encountered a liquidity shock. Without proper control for demand-side factors, the estimated results will be biased. To work around this problem, several studies employ instrumental-variables approaches that use banks' political and regulatory connections as instruments to control for the endogeneity of bank participation in TARP (Duchin and Sosyura, 2014; Li, 2013; Montgomery and Takahashi, 2014). Nevertheless, because it is difficult to test the validity of these instruments, researchers often have to rely on persuasive arguments, economic theory, and common sense to establish the validity of their instruments. Inevitably, this limitation adds uncertainty to the estimation results of instrumental-variables approaches. Furthermore, while this instrumental-variables approach may help eliminate the endogeneity of bank participation in TARP, it is unclear how this approach will completely solve the problem of controlling for demand-side factors.

By contrast, the most important benefit of evaluating the effects of these programs on bank lending using the syndicated lending data is that it allows researchers to separate the demand-side factors from the supply-side factors. Specifically, one prominent feature of syndicated lending is that there are multiple lenders in each syndicated facility. By comparing the lending changes within a group of lenders that lend to the same facility of the same firm in the same year, researchers can eliminate the demand-side factors and focus on the supply-side factors. For this reason, such a study is analogous to the classical "identical twin" design that is widely used in scientific research. Therefore, I achieve identification through the inclusion of facility-time fixed effects, which are facility fixed effects interacted with time fixed effects. This identification strategy controls for the combined effects of observed and unobserved facility-level factors, firm-level factors, and macroeconomic factors.

This study is not the first that uses facility-time fixed effects to control for demand side factors. For instance, facility-time fixed effects are used by Duchin and Sosyura (2014) to control for credit demand at the level of each borrowing firm. Using data from Thomson-Reuters Loan Pricing Corporation's (LPC) Dealscan database, Duchin and Sosyura (2014) examine whether TARP affects the relative shares of participating lenders in a syndicated facility at the time of origination. However, the Dealscan database

[2] For instance, the New York Times reported that an overwhelming majority of bank executives from two dozen US-based banks viewed TARP as the fund that could be used to pay down debt, acquire other businesses, or invest for the future, rather than to increase lending to the private sector (http://www.nytimes.com/2009/01/18/business/18bank.html). Because the scope of this study is limited to examining bank syndicated lending only, the results in this study do not rule out the possibility that banks receiving funding from TARP, DW, and TAF increased other types of lending.

[3] An unrelated study that also examines the Fed's liquidity programs is Gauthier et al. (2014), who argue that healthy banks participated in TAF to signal their quality.