Unintended effects of the TARP program: Evidence from relationship borrowers of the TARP recipient banks

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Abstract

Using the Trouble Asset Relief Program (TARP) as a laboratory, this paper examines the impacts of bank bailouts on bank clients. We find that the aided banks' clients suffer an economically significant valuation loss of 1.2 % in the 3-day window around the announcements of their banks' approvals to TARP. Such valuation losses are aggravated with bank's poor ex-ante financial condition. Further evidence shows that aided banks reduce the supply of credit in post-TARP period. The reduction is aggravated with bank's poor ex-ante financial condition, and ex-post increases in liquid asset holding. This evidence is consistent with the conjecture that banks' precautionary savings lead to a decline in credit supply. Finally, we find that clients of aided banks become more financially constrained in post-TARP period, leading to reductions in investment. Overall, our findings suggest that TARP fails to ease the credit crunch or to stimulate investment in the real sector.

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"Congress approved the $700 billion rescue plan with the idea that banks would help struggling borrowers and increase lending to stimulate the economy, and many lawmakers want to know how the first half of that money has been spent before approving the second half. But many banks that have received bailout money so far are reluctant to lend, worrying that if new loans go bad, they will be in worse shape if the economy deteriorates."

<Bailout Is a Windfall to Banks, if Not to Borrowers>
New York Times
Jan 17th, 2009

"In short, although the TARP provided critical government support to the financial system when the financial system was in a severe crisis, its effectiveness at pursuing its broader statutory goals has been far more limited."

<Assessing the TARP on the Eve of Its Expiration>
Federal Reserve Bank Report
Sept. 16th, 2010

1. Introduction

In the global financial crisis of 2008, many governments around the world aggressively stepped in to rescue the economy with various types of stimulus packages in response to a potential massive failure in the financial system and severe credit crunch in the economy. Among these rescue programs, the Troubled Asset Relief Program (TARP), the largest government bailout program in the US history, has attracted the most attention globally. Although a large literature[2] in economics and finance suggests that an active government intervention in credit market is beneficial to the economy during crisis, the effectiveness of such government intervention in achieving its initial goals remains controversial (Hoshi and Kashyap, 2010; Diamond and Rajan, 2011; Giannetti and Simonov, 2012). As for TARP, debates over its effectiveness have been widely carried out in the US policy making bodies as well as in the general public. This paper focuses on the Capital Injection Program (CPP) as this is the largest program inside the TARP.

[2] E.g. Gerschenkron (1962), Atkinson and Stiglitz (1980) and Bebchuk and Goldstein (2011)

On one hand, participation in TARP could implicitly signal the government support, leading to a reduction in bank's downside risk. Conceptually, such a benefit could be passed to the real sector in that recipient banks could supply more credit to relationship clients and ease their financial constraints. On the other hand, both the public and some economists posited that many of these TARP recipient banks (henceforth, *TARP bank*) could withhold the bailout capital instead of lending out to the U.S. corporations and households, against the objective at initiation that is to enhance market liquidity. As highlighted in the press, the TARP program created a large regulatory burden to the recipient banks. This persists even if the banks have repaid the TARP funds. The regulatory burden due to limitations on executive compensation have been widely publicized, however, these limitations end once a bank exits the TARP program. What is not as well recognized is that the TARP recipient banks have a legal liability that extends beyond the repayment date. Indeed, a report by the Special Inspectorate General for the TARP program (SIGTARP) to the US Congress on July, 2014, documents several legal actions against TARP banks where the alleged wrong-doings were done well prior to the period that the institution accepted TARP funding. Such regulatory uncertainty could have the effect of reduction in lending, similar to the effect on lending due to an increase in economic uncertainty.[3]

Keeping the above potential real effects in mind, our paper examines the real effects of the CPP program in TARP, focusing on the short run and long term effects of this program on the relationship borrowers of the banks that participated in the CPP.

[3] It is important to recognize that this paper does not seek to estimate the net benefit or cost of increased regulatory scrutiny, as the data we use do not permit such an examination.

Since our paper focuses on borrowing firms, the specific channels we examine are two folded. First, we examine short run effects in terms of borrower stock return. Second, we examine long run effects on borrowing firms. The long run effects that we study are (i) supply of credit by TARP banks to their borrower, (ii) reliance on bank debt, (iii) cash flow sensitivity of cash, and (iv) firm level investment and its variation with financial constraint measures. With a net benefit accruing to borrowing firms, we should find that TARP borrowers have an increase in the supply of credit and this should also increase their reliance on bank debt. Further, their cash flow sensitivity of cash should decrease, firm level investment should increase and more constrained firms should benefit more from the TARP injections. The reverse should be true if TARP results in a net cost to borrowing firms. Thus, such borrowers would form an ideal testing laboratory for testing TARP's effects on the real economy.

Conditional on there being a negative effect, there are two alternative explanations for this – liquidity hoarding by banks, and increased regulatory scrutiny. We test for both of these non-mutually exclusive effects on borrowing firms. Of course, the null hypothesis is that TARP had no effect on the real economy, and only had an impact on the financial sector, in which case we should observe no effect on borrowing firms.

In order to test this hypothesis, we employ LPC Dealscan database to identify firms having ex-ante relationship with TARP participant banks (henceforth, *TARP firms*), supplemented with financial and stock information from CRSP and Compustat. The data sample spans the period from 2006 to 2011 for all public companies in US with lending activities reported in Dealscan before the announcement of TARP in 2008.

We first show that TARP firms suffer an average valuation loss of 3.01% in the 3-day window around their main banks' TARP approval announcements. In addition, multivariate analyses further confirm the findings by showing that TARP firms on average experience an additional 1.20% reduction in 3-day CARs relative to control firms.

The question remains about if the TARP banks really reduce the supply of credit, ex post. To answer this question, we further examine the impact of government injection on credit supply of TARP banks. Following Khwaja and Mian (2008), we control for firm-year fixed effect in a bank-firm-year panel data to rule out the demand side effect. Consistent with anecdotal evidence that banks withhold the bailout capital instead of lending out, we find a significant reduction in supply of credit from TARP banks after government capital injection in 2008.

Therefore several reasons why banks could reduce the credit supply. For example, Diamond and Rajan (2009) suggest that bank's reluctance to lend could due to: (i) worries about borrower's credit risk (ii) credit demand of their own (regulatory cost) (iii) fear of short of funding if good investment opportunities come along. Given that the demand side effect is well controlled, the reduction in credit supply appears to be driven by the precautionary saving.[4] To further verify this argument, we investigate the variation in the credit supply across banks' ex-ante financial condition. We find that the magnitude of reduction is significantly and adversely correlated with bank's ex-ante financial health. Therefore, it is unlikely that the precautionary saving is driven by the fear of forgone of good investment opportunity. In addition, we find that the ex-post increases in cash holding in banks are associated with further cuts in credit supply, reinforcing that precautionary saving arising from regulatory cost

[4] Such saving can be due to regulatory cost or future growth opportunity.

is the reason why banks withhold capitals. This direct evidence also reinforces the findings in announcement tests, suggesting that scarce of future financing from TARP banks leads to valuation reduction of TARP firms. Third, from firms' perspective, we examine the impact of TARP on its reliance on bank credit. Our findings show that the proportion of bank loans in the total debt of TARP firms significantly drops after TARP injection. Once again, this confirms the early findings.

Finally, we examine the real effects of TARP on participant's banks' clients' ex-post performance. We start with testing whether TARP firms become more financial constrained after government injection in their main banks. In specific, we study the propensity to save cash from cash flow to examine the degree of financial constraint of TARP firms. We find that the cash holding of TARP firms become more sensitive to cash flow after their main banks' participation in TARP. However, no effect is found in non-TARP firms. Next, we investigate the investment activities of TARP firms. Consistent with previous results on cash flow sensitivity, we find that TARP firms significantly reduce investments after their main relationship banks' participations in TARP. We further explore whether reduction in investment of TARP firms is due to the financial constraint or simply the precautionary saving by sorting on TARP firm characteristics. If investment reduction is due to firm-level precautionary saving, one should expect to see larger reduction in ex-ante less financially constrained firms. However, we find that small, highly leveraged, high White and Wu (2006) (WW) ratio firms response more to TARP by reducing their investments. These results are consistent with the conjecture that TARP firms reduce their investments because they became more financially constrained subsequently.

An important empirical challenge in our tests lie in that the TARP banks turn out to be larger and more systematically important than non-TARP banks. Such heterogeneities can potentially affect our results. The great advantage of the DID approach employed in our study is to rule out the ex-ante heterogeneities in bank level as long as they are time invariant (Parallel Trend Assumption). To ensure the parallel trend assumption is valid, we further employ a propensity score matching algorism in bank level in our robustness tests. Specifically, for each TARP bank, we find one (five) nearest-neighbourhood match from the non-TARP banks based on the propensity score that is defined as the probability of receiving TARP funds conditional on the covariates. The covariates on which we estimate the propensity score include: bank size, Tier one capital ratio, ROA, missing of tier one capital ratio and loan to asset ratio. Our results are consistent for all these robustness tests.[5]

To the best of our knowledge, the paper is one of the first to examine the effect of TARP beyond the financial system. In related works on TARP, Bayazitova and Shivdasani (2012) find that strong banks rather than weak ones opted out of participating in TARP as the capital injection is relatively costly to these banks. Veronesi and Zingales (2008) highlight the net benefit arising from a reduction in probability of bankruptcy associated with first round TARP injection to nine banks on October 14, 2008. Duchin and Sosyura (2011b) suggest that banks take on more risk after government bailout. Ivashina and Scharfstein (2010) argue that the liquidity drain due to runs by short-term creditors and borrowers who drew down credit lines leads to banks to cut their lending. Our paper adds to the literature by

[5] In an earlier version, we also conduct a propensity score matching method in client firm level, the results are qualitatively the same.

providing a time response to the general debates on the effect of TARP on the real sector.

In addition, our paper adds to the literature evaluating the real effects of government financial interventions during crisis. Diamond and Rajan (2000), Diamond (2001), and Hoshi and Kashyap (2010) argue that too small recapitalizations may encourage perverse lending policies and even decrease the supply of credit for borrowers with valuable investment opportunities. Particularly, our paper belongs to a handful of studies investigate the systemic impact of government interventions in real economy. For example, Giannetti and Simonov (2012) investigate the real effect of capital injection in Japan and find that capital injection increases the value of bank clients, especially for those zombie clients. In contrast, we find that capital injection in US is bad news for bank-dependent firms. However, the findings in their paper and ours are not mutually exclusive but in fact consistent with each other. Our results appear to suggest that, once the banks are no longer under-capitalized, which is the case in TARP, banks may not have incentive to lend during the crisis. In addition, the difference in results between Giannetti and Simonov (2012) and this paper also highlights the importance of institutional background in assessment of government intervention, as given same set of intervention tools are adopted, various outcomes could be obtained in different regulation and economic environments.

Lastly, this paper contributes to the growing body of literatures investigating the adverse signalling of government interventions in financial market (Peristiani, 1998; Furfine, 2003; Ennis and Weinberg, 2009, Armantier et.al, 2012). Our paper suggests that even the adverse signalling associated with participation in government rescue program may not be directly observed at bank level, it could

transfer from bank to its relationship firms, resulting in significant valuation losses of client firms. The study in this paper improves our understanding on design of such government intervention activities by opening up new angle to look into the potential problem.

The rest of the paper is organized as follows. Section 2 provides the institutional background on TARP. We review the literature and propose the hypotheses in section 3. Section 4 discusses the data and variable definitions. Section 5 presents and discusses the empirical findings. Finally, section 6 concludes.

2. Institutional Background

The financial crisis of 2008 in the US started with the collapse of investment banking giant – Lehman Brothers. On September 15, 2008, Lehman Brothers filed for bankruptcy protection, unleashing chaos in the financial markets. To stabilize the financial markets as well as alleviate a potential credit crunch, the US Government proposed emergency measures that were Troubled Asset Relief Program (or TARP). TARP was signed by President Bush into law the Emergency Economic Stabilization Act (EESA) of 2008 on October 3, 2008. The $700 billion TARP consisted of 13 programs with the objective to calm the massive panic and to restore investors' confidence. One of the most prominent of these was the Capital Purchase Program (CPP) to inject capital into financial institutions.. Although at the conceptualization stage, the TARP was aimed at calming markets using secondary purchases of mortgages, in fact, the US Treasury release on Oct 6, 2008 makes the first goal as strengthening financial institutions using guarantees and/or capital

injections.[6] Thus, the CPP was, in fact, the most important goal within the various programs announced as part of TARP. This particular program of the TARP also attracted a lot of attention in the press due to its (perceived or real) favoritism towards large Wall Street firms. As we seek to examine the impact of capital injections into banks on their borrowers, the CPP provides the ideal experiment for us to test such effects.

As of December 2009, Treasury invested $204.9 billion in 707 financial institutions in 48 states via CPP.. The first round of CPP equity injection went to nine financial institutions on October 14, 2008, and involved a total capital injection of $125 billion into these institutions. These nine institutions were Goldman Sachs, Morgan Stanley, Bank of America, Merrill Lynch, Citigroup, JP Morgan, Bank of New York Mellon, State Street, and Wells Fargo. From October 15 through November 14 in the same year, an additional 53 banks received $50.3 billion in CPP capital, and from November 15 through April 24, 2009, a further 419 banks received equity infusions totalling $14 billion. To account for the possibility that the attributes of CPP recipients changed over time, we consider the initial 9 institutions to be in "round 1", those who received CPP before the November 14 deadline to be in "round 2" and later recipients to be in "round 3".

Under the CPP, the US Treasury invested in these financial institutions through non-voting preferred shares, and the size of investment was restricted to be between 1% and 3% of the firm's risk-weighted assets.[7] For the first round of funding, the list of institutions was approved directly by the US treasury and any negotiations with the nine financial institutions were privately done. This was ostensibly done to avoid

[6] http://www.treas.gov/press/releases/hp1177.htm
[7] The maximum threshold is set at 3% of risk-weighted asset or $25billion.

the stigma effect that may have resulted in creditor runs for the bailed-out financial institutions. Anecdotal evidence suggested that the US government applied informal pressure on several financial institutions to accept the TARP funds.

For the second round onwards, the US government announced guidelines for application for capital injections under TARP. Specifically, a financial institution needed to be a US domestic bank, bank holding company, saving associations, or savings and loan holding companies (SNLs) and submit the application to its primary regulator, such as Federal Reserve and FDIC by November 14, 2008. Subject to first round review via Camels rating system, a successful application was forwarded to the Treasury for final approval. Approved banks received TARP funding as preferred stock, which was designed not to dilute the outstanding common shares. Recipient banks were required to pay 5% dividend on a quarterly basis for the first 5 years and 9% thereafter. In addition, the Treasury also received warrants valid for 10 years to purchase common stock for an amount of 15% of the preferred share investment.

All TARP participants needed to comply with the restrictions attached to the program such as limitations on executive compensation. Possibly due to this, several banks repaid the TARP funds within a few months of their receipt of the TARP funds. On March 31, 2009, four banks announced their repayment of all preferred shares issued to the U.S. Treasury. On 9 June 2009, ten TARP recipient banks announced that they had decided to repay the funds and leave the CPP program. The banks, including Goldman Sachs, JP Morgan Chase, American Express, and Morgan Stanley, were granted permission to repay a total of $68 billion and free themselves on the restrictions in place under the TARP act. Many other banks submitted applications to repay CPP infusions as well.

3. Literature Review and Hypothesis Development

Many studies point out that adverse signalling would significantly deter banks' participation in government rescue program as firms' access to government supportive programs may send negative signals about their financial health to the market (e.g. Ennis and Weinberg, 2009; Hoshi and Kashyap, 2010). However, Bayazitova and Shivdasani (2012) find a positive and significant abnormal return for TARP banks around TARP initiation, suggesting that there is no stigma effect associated with receiving TARP funds. The above suggests that TARP borrowers should unconditionally benefit from their bank's bailouts.

The mechanisms for this are several. First, the bailout alleviates the bank's funding problems which should increase the available funds of the bank to lend. Second, the bailout may reduce the precautionary savings by banks (Gamba and Triantis 2008; Riddick and Whited, 2009). Both of these would increase the quantum of funds available for the bank to lend. Third, the bailout may signal implicit government support. Fourth, the bailout funds may have a significant element of subsidy in terms of their cost. Indeed, Veronesi and Zingales (2008) find a large degree of subsidization associated with TARP funding. Both of these would reduce the bank's cost of capital. As shown theoretically by Allen, Carletti and Marquez (2014), as well as empirically by Hubbard, Kuttner and Palia (2002), a bank's cost of funds does impact the cost of bank debt to its client firms. Thus, by reducing the cost of bank's capital, TARP would also reduce the cost of funding for its borrowers thereby benefiting them.

Lastly, the bailout would surely reduce the bankruptcy likelihood of the bank. From the results in Slovin, Sushka and Polonchek (1993) as well as Megginson et al

(2011), we know that a bank's clients suffer significantly on its bankruptcy. This is attributable to the value loss of the relationship between the borrower and lender, where the borrower cannot easily find an alternative lender. Since TARP would surely reduce this bankruptcy's risk of the bank, this is also likely to benefit their relationship borrowers.

On the other hand, there are also theoretical and empirical arguments against TARP having a positive effect on a bank's borrowers, in fact, even possibly a negative effect. Theoretically, Diamond and Rajan (2011) point out that capital injection into weak institutions with illiquid asset would increase risk of fire sales, and aggravate the credit rationing problem. Partial support for this is found in Giannetti and Simonov (2013) who find that only large capitalizations work and that inadequate capitalizations leading to liquidity hoarding. However, in the case of TARP, our evidence indicates that most institutions were adequately capitalized after TARP. Acharya et al (2011) also show that banks may choose to hold more liquidity for acquisition motives, specifically acquiring weaker financial institutions later at fire sale prices.

There is a third effect of TARP that has received less attention in the academic literature, but has been discussed much more in the press. Specifically, several banks exited TARP specifically citing a high regulatory burden and governmental interference in their operations as a motive. However, this regulatory burden can last even after a bank exits TARP. As an illustration, in their report to the US Congress in July, 2014, SIGTARP (Office of the Special Inspectorate General for the TARP Program) have pressed charges on over 196 individuals and insitutions that had participated in the TARP program. A reading of some of these reports makes it quite clear that the time period of several of these alleged offenses were prior to the

time that the bank accepted the TARP program. This raises the possibility that institutions that accepted TARP money, regardless of their repayment status, have a legal liability that extends beyond the time period that they were recipients of the TARP funding.

Suggestive evidence is also found in other places. For example, a Wall Street Journal article on July 4, 2014 titled "Bank cost cuts fall short as growth stays tepid: Rising Pay, Regulatory costs offset recent efforts," reports that the top 6 banks in the US had 9.7% reduction in revenue between 2009 and 2013, while non-interest expenses rose by 9.6% in the same period. The article attributes a large part of the increase to increased regulatory costs. Indeed, J.P.Morgan is reported to have increased its compliance staff by 13,000 employees between 2012 and 2014, despite heavy cuts in the number of employees in other divisions.

Further, evidence of the potential real effects of a regulatory burden is also made, for example, by the American Bankers Association. In a letter to the US President on January 11, 2011, the CEO of ABA states, "Unfortunately, banks have been put in a regulatory straitjacket that is being made increasingly tighter, restricting the ability of banks to lend to good customers, or to devote their resources to lending and financial services. Instead, too many bank resources are being side-lined into regulatory compliance activities." Likewise, in an article in the Financial Times on August 8, 2014, HSBC Chairman hints, "Staff facing uncertainty as to what may be criticized with hindsight," may result in lowering of credit to high risk companies.

It is important to note that these negative effects of TARP may persist even if the institutions repay the TARP money. For example, the effects predicted in Dimaond and Rajan (2011) and Acharya (2011) would hold persist if the bailout program were to be discontinued after a while, as acquisition motive would continue to persist.

Similarly, the increased regulatory scrutiny would likely last beyond the duration of the time during which the bank received the bailout money, as institution continue to be liable for their actions.

Motivated by the above, we study short run as well as long run effects of TARP on relationship borrowers of the TARP recipient banks. Our focus on relationship borrowers is justified by the long literature in relationship banking that strongly suggests the special value of lender borrower relationships (See Boot (2000) and Degryse, Kim and Ongena (2007) for surveys).

4. Data and Variables

We start with classifying banks into two groups, namely TARP bank and non-TARP bank. A "TARP bank" refers to a bank that received government equity injection via the Capital Purchase Program of the TARP, whereas non-TARP bank is one that did not receive any funding via the Capital Purchase Program. Because of our paper starts with examining announcement effects, we first manually identify the announcement date of a bank being approved to TARP program[8]. For banks with multiple TARP fund injections, we only consider the earliest announcement in the analyses. As a result, out of the 559 banks in the sample, we successfully identify the approval announcement dates of 393 banks (approx. 70%). Next, we require TARP banks to have lending activities reported on Dealscan, and this gives us a final sample of 101 TARP approval announcement events. Among the 101 TARP banks, only 33 event banks have financial information from Bankscope for year 2006

[8] We thank Bayazitova and Shivdasani (2012) for sharing the data on announcement date of TARP approval for participating banks, and we manually check and supplement data with Factiva.

and 2007[9], and the 33 event banks TARP approval announcements take place in 19 different dates. For other banks which have lending activities reported in Dealscan before Oct. 2008, as well as financial information reported in Bankscope in 2006 and 2007, are classified as non-TARP banks in our paper.

Therefore, our sample contains 2,012 public firms which meet the following three requirements: (1) have borrowing activities reported in LPC Dealscan from 2003 to Oct. 2008 with any of the TARP or non-TARP banks as described as above; (2) have financial and stock information from Compustat[10] and CRSP and specially with non-missing total asset in fiscal year 2007; (3) are non-financial and non-utility firms, which exclude firms with one-digit SIC equals to 6 and firms with two-digit SIC equals 49.

A borrowing firms' relationship bank (or main bank) is defined as one that secures the largest share of lending by dollar value from 2003 to October 1st 2008. If two banks have the same share, then both are classified as main banks. A TARP firm is defined as one where any of its main banks was a TARP recipient, and is present in the sample of 2012 firms based on the three criteria defined above. A non-TARP firm is any other public firms which satisfy the above three criteria, but none of their main banks receive government funding through TARP. Based on this classification, 1402 borrowing firms are classified as TARP firms and 610 borrowing firms are classified as non-TARP firms. Figure 2 provides a graphical demonstration of the sample definition.

[9] We manually merge TARP banks with Dealscan and Bankscope based on their ultimate parent at the time of TARP injection. For Merill Lynch, we considered it as part of Bank of America in our sample. Bank financial information used in this paper is the two year average from 2006 and 2007.

[10] We thank Michael Roberts for providing Dealscan and Compustata the link table, which is an updated version as used in Chava and Roberts (2008). Please see Michael Roberts' website for the data: http://finance.wharton.upenn.edu/~mrrobert/styled-9/styled-12/index.html

Our first measure of a firm's potential benefit (or cost) to the TARP injection is simply a dummy for being a TARP firm itself. In addition to the above, we create two additional measures of exposure to the TARP that measure the strength of the relationship between a bank and its borrowing firm (conditional on the bank participating in the TARP program). These are: (1) the fraction of loans (by dollar value) received by the TARP firm from its TARP bank between 2003 and October 2008, and (2) the fraction of loans (based on the number of loans) from the TARP bank to a given borrowing firm between 2003 and October 2008. The rationale for these additional measures is that a given borrowing firm may have varying degrees of dependence on its main bank that the dummy variable does not capture. Thus, these variables may provide more precise estimates of the impact of TARP on borrowing firms.

Table 1 reports the summary statistics of sample firms in the paper. Financial information is obtained from the annual financial filing in Compustat. To mitigate the potential bias due to the deterioration in economic conditions in the second half of 2007, values reported in Table 1 are average across 2006 and 2007. On average, treatment and control firms are very comparable.

5. Empirical Results

Before we start analysing our data sample, it is useful to examine the data on aggregate lending by all US financial institutions, segregated by CPP recipient institutions and non-CPP recipient institutions. This data is available from the US

Treasury web site report for the 4th quarter of 2010.[11] The treasury discontinued this report after this time period. From this data, we present selected items extracted from Exhibits I to VII in this report. The U.S. Treasury segregates financial institutions into four categories – (1) Total assets above $100 billion. (2) Total assets between $10 billion and $100 billion. (3) Total assets between $1 billion and $10 billion, and lastly, (4) Total assets below $1 billion. We follow this categorization for this section. Appendix 2 presents the aggregate growth in assets and loans from the third quarter of 2008 to the fourth quarter of 2010. As can be seen, in virtually every size of the bank (with the exception of the top category of banks above $100 billion where all the institutions are CPP recipients), CPP recipients have a significant negative loan growth (relative to the non-CPP recipients) in the same category. This pattern is also present for loans in the commercial and industrial category, which are more likely to be loans for public companies that we seek to examine in greater detail.

Appendix 3 presents a comparison of regulatory ratios as well as bank performance measures in the 4th quarter of 2010, which is the last year this data is available. One pattern is striking. In every size category, the performance of TARP banks is significantly worse relative to non-TARP banks, with the exception of the smallest size category. This holds true both for Return on Assets as well as Return on equity, where these are measured at the end of 2010. Interestingly, a similar pattern is true even for the third quarter of 2008, although the differences are smaller in magnitude. Current losses (measured by the percentage of loans that are charged off), and expected losses (percentage of loans that are not current, i.e.,

[11] Web link: http://www.treasury.gov/initiatives/financial-stability/TARP-Programs/bank-investment-programs/cap/cpp-report/Documents/Quarterly%20CPP%20Report%20Q4%202010.pdf

behind payments) are also higher in the TARP recipient category. Thus, TARP recipients are demonstrably in worse financial condition, even at the time of the granting of TARP funds by the US government.

An interesting side issue is that all the banks (TARP and non-TARP) are all well above regulatory thresholds required in terms of their current regulatory capital ratios. At the same time, even for these, TARP banks have lower regulatory capital ratio, suggesting a higher likelihood of regulatory scrutiny for these banks relative to non-TARP banks. This suggests that liquidity hoarding to meet the current regulatory thresholds is unlikely to be a determinant of the use of TARP funds.

Overall, the aggregate summary statistics from the U.S. Treasury presents a mixed picture. On one hand, it is quite clear that TARP recipient banks reduced their lending significantly relative to non-TARP banks. Further, the decreases in lending to industrial and commercial customers, who are more likely to be large publicly traded firms that we will study in more detail, are even more extreme relative to the overall decrease in lending. On the other hand, some of these differences may be accounted for due to different lending portfolios of TARP and non-TARP banks prior to TARP, as well as differences in the demand for loans by customers of these banks. Our subsequent analysis will focus again on the LPC data sample, where we have detailed information on the relationship customers of these banks. A significant advantage of this approach is that we can control for demand side effects of credit. Indeed, the treasury report cited earlier mentions this as one of the important challenges in assessing the impact of TARP on lending behaviour of banks.

5.1 Announcement Effect of TARP Approval

To study the announcement effect of TARP firm, we adopt the event study methodology. A 260-day estimation window is implemented, i.e. [Day -290, Day -31] and firms are required to have non-missing returns on all days from day -5 to day +5 around the announcement date. Slightly different from the earlier definition of treatment and control groups, in analyses of announcement effects, we define the treatment as observations of abnormal returns of TARP firms around the approval announcement of their related TARP banks. However, control contains observations of abnormal returns of all non-TARP firms on all the 19 announcement dates in our sample. Noted that the number of treatment is slightly higher than the number in Figure 1, this is because some treatment firms have more than one main banks. Hence, for these firms, if their main banks get approved to TARP on different dates, there will multiple observations of the firm at different announcement date. In addition, since TARP approvals are likely to cluster in time, for multiple announcements on the same date, we consider them as a single event in the baseline regressions and pool the treatment and control sample to delete duplicated observations. Table 2 first provides univariate results of cumulative abnormal return. TARP is initiated with the goal to inject liquidity to the economy and to alleviate credit crunch. Hence, one should expect a positive announcement effect on stock return of firms in the economy, especially to those firms with lending relationship with TARP banks. However, our results show consistent negative and significant CARs for treatment sample over different event window and across different model specifications.

In panel A, first with adjusted market model, we find that treatment firms experience an average negative CAR of -3.01% over a three-day window around announcement. Although control firms also experience a significant and negative

CAR of -1.09% in the same period, the magnitude in CAR is significantly smaller than treatment firms. As event window increases, the sign of CARs become positive for control firms. However, consistent results are found in treatment firms in the seven-day and eleven-day windows around announcement. In the rest of panel A, we also calculate CAR over different event windows with Fama-French three-factor model and Fama-French-Carhart four-factor model respectively. The patterns in the abnormal returns are consistent under all three model specifications and treatment firms have significant and negative CARs for all the examined event windows and the magnitudes are significantly larger than control firms.

Noted that the most of the TARP banks are larger and more systematic important, an empirical challenge lies in that we can hardly find a proper control banks, and thereby control relationship firms in our tests. Specifically, for TARP bank, we find a nearest-neighbourhood match from the non-TARP banks based on the propensity score that is defined as the probability of receiving TARP funds conditional on the covariates. The covariates on which we estimate the propensity score include: bank size, Tier one capital ratio, ROA, missing of tier one capital ratio and loan to asset ratio. Distributions of size, ROA, liquid asset and tier 1 ratio of matched banks are shown in Figure 3. We define the clients of these matched non-TARP banks are control group. This matching algorithm also helps us overcome the concern that the TARP banks might be self-selected, since we are comparing two groups of banks that are most similar in terms of getting TARP participation decisions. The result reported in Panel B show that, comparing to the relationship clients of matched non-TARP bank, the clients of TARP banks experienced significant value loss (-3.01% VS -0.72%). The limitation of one to one matching lies in that some of the matched banks are foreign banks(around 30%), who have smaller market share, and

therefore the number of control firms are much smaller than that of treatment firms. As such, we repeat the same algorism and conduct a one to five matching method to ensure the number of treatment firms is comparable to that of control firms. We find a qualitatively similar evidence that TARP firms experienced significant value losses during the announcement window (-3.01% VS -1.11%).

We further employ multivariate analyses in Table 3. OLS regressions are run on abnormal returns around TARP approval announcements followed equation (1)

$$CAR(-1, +1)_{i,t} = \alpha\ TARP_{i,t} + \gamma F_i + \varepsilon_{i,t} \quad (1)$$

Dependent variable is CAR (-1, +1) of firm i around approval event at time t. The main independent variable is $TARP_{i,t}$ where i refers to firm i and t refers to event at time t. $TARP_{i,t}$ is constructed based on the past 5-year lending relationship prior to October 1st 2008 between firm i and banks which receives the approval of TARP at time t. Particularly, we require the event bank to be the main bank of sample firms in the calculation of $TARP_{i,t}$. Three measures of $TARP_{i,t}$ are used in the paper. The first measure is a dummy which equals to one if event bank is the main bank of the firm based on the past 5-year lending relationship prior to October 2008, and zero otherwise. Two other measures which substitute the TARP dummy with the actual amount and number of loans from the event bank to the sample firm are also adopted in the analyses. For firms with exposure to multiple TARP banks on the same event date, we accumulate the exposure measure. Plus, variables to capture firm characteristics and industry fixed effect are included in the regressions.

In column 1 and 2 of Table 3, we find a consistently negative and significant coefficients of *TARP* dummy, indicating a -1.2% reduction in CAR (-1, +1) given the event bank is the main bank of the firm. Next, we substitute exposure dummy with exposure variables measured by amount and number of past loans with TARP bank.

Consistent with dummy measure, the estimation from OLS regression reflects a -1.5% sensitive of *CAR* (-1, +1) to firm's exposure to TARP injection as of past lending relationship amount, and a similar level of coefficient is obtained for number exposure measure.

Furthermore, we examine if there is any heterogeneity in announcement effects across different round of TARP injections. We divide the sample into three sub-groups according to the announcement date. Round 1 includes all the sample observations of TARP announcements on October 14, 2008. This includes 8 banks, namely Bank of America, Citigroup, BNY, Wells Fargo, State Street, JP Morgan, Morgan Stanley, and Goldman Sachs. Approval announcement dates between October 21, 2008 and November 14, 2008 belong to round 2, while announcement dates between November 15, 2008 and September 24, 2009 are classified as round 3. In the OLS regression shown in column (5), interaction terms between TARP and Round dummies are added in. A significant valuation loss is found in round one and two, suggesting the negative price reaction to main bank's TARP approval announcement is not driven by a particular round of TARP injection but associated with the entire program. In panel B of Table 3, we repeat the tests using the one to one matching sample and one to five matching sample.[12] The results are qualitatively the same as those in panel A. Overall, both univariate and multivariate analyses indicate a significant valuation loss suffered by firms with exposure to TARP approval announcement. We interpret these results of announcement effects as evidence to support our hypothesis. Our results don't go against Veronesi and

[12] We employ propensity score matching based on the following bank variables: size, tier1, missing of tier1 ratio dummy, loan to asset ratio, and ROA. The matching procedures are conducted at the bank level rather than firm level. Therefore, the number of treatment firms is not the same as the number of control firms even in a one to one matching procedure.

Zingales (2008), and Bayazitova and Shivdasani (2012) that TARP banks experience positive and significant abnormal returns at approval announcement. We argue that TARP serves as an insurance or government guarantee which offsets the adverse signalling at bank level. Nevertheless, TARP participation still reflects bank's bad shape, and investors anticipate relationship firms of TARP banks to experience a lending shortfall in the near future.

Next, we examine how banks' ex-ante characteristics affect relationship firms' price reaction to TARP approval announcements. As we argue that valuation reduction of TARP firms is primarily due to the adverse signalling associated with TARP participation, one should expect firms associated with TARP banks with poorer ex-ante financial health suffer more in valuation loss around the banks' approval announcement. A series of regressions are run followed the model specification as equation (2) on the announcement abnormal return of firms conditional on existence of exposure to TARP approval announcement.

$$CAR(-1,+1)_{i,t} = \alpha Bank\ characteristics_{i,t} \times TARP_i + \gamma F_i + \varepsilon_{i,t}. \quad (2)$$

Bank ex-ante characteristics incorporated in the analyses include the injection size, ROA, tier 1 capital ratio, Δtier 1 capital ratio and Δliquid asset. Detailed variable definitions are provided in the appendix. We also create a dummy variable which equals to one if tier 1 capital ratio is missing in Bankscope. In addition, firm financial characteristics including size, cash/asset, leverage, market-to-book, ROA and interest coverage as well as industry fixed effect are controlled in the estimations.

Table 4 provides the regression results. First, in panel A, we regress client firms abnormal returns on TARP banks' ex-ante financial conditions. In column 1, we

examine the effect of injection size on firms' stock reactions to their main banks' TARP approval announcements. However, we fail to find any significant result. In addition, we examine the relation between banks' ex-ante tier 1 capital ratio and client firms' stock response to TARP approval announcements. Tier 1 capital ratio is an indicator of bank's financial strength and a positive and significant coefficient is found for its interaction term with exposure to TARP dummy. This suggests that a higher ex-ante tier 1 ratio is associated with a higher announcement CAR. Along the same line, we find that a higher ex-ante ROA is also associated with a higher CAR. We further test the incremental effect of ex-post changes in tier 1 capital ratio and liquid asset. We find that client firms experience a larger decline in stock price if their main banks increased the position on liquid asset. This finding is consistent with our argument that TARP induces more precautionary saving of banks, and thereby adversely affects clients' market value through credit channel.

5.2 Announcement Effect of TARP repayment

As discussed in the hypothesis development section, the negative effects of TARP may persist even if the institutions repay the TARP money. If this is the case, we can expect the repayment of TARP fund does not have significant impact on the TARP bank dependent clients. To examine this conjecture, we estimate the CAR for the TARP bank dependent borrowers upon the announcement of TARP fund repayment. The results are reported in table 5. Consistent with our prediction, we do not observe any significant effect of TARP repayment on TARP bank dependent clients' market value. Therefore, our finding suggests that the increased regulatory scrutiny last beyond the duration of the time during which the bank received the bailout money.

5.3 Access to Bank Credit

Built on the previous suggestive evidence, we further examine the potential channels which could lead to valuation losses of client firms of TARP banks. In particular, we study the effect of TARP injection on firms' ability to access to bank credit. As one of the key objectives of TARP is to inject liquidity to the economy, to examine the ex-post impact of TARP on credit accessibility is not only important to supplement findings on announcement effects, but also crucial to evaluate the effectiveness of TARP in easing firm's fund constraint and increasing degree of accessibility of credit to the U.S. corporations.

First, we test the effect of TARP on banks' supply of credit. We argue that TARP firms may not be able to access to bank credit as TARP banks choose to maintain the government fund in order to overhaul their balance sheet and to improve their capital ratio. As a result, lending from the TARP banks will decline subsequently. To test this, OLS regressions are run on the change in the total loan amount from a certain bank to a particular firm before and after TARP injection. For each sample firm, we create a set of bank-firm pairs from the Dealscan banks. For potential pool of banks, we require the banks to have lending activities to any US public firms reported in Dealscan after 2005. This gives 223 banks and this creates a bank-firm panel of 688,104 (=342 x 2,012) pairs. For each bank-firm pair, we identify lending activities from Dealscan and classify loans originated in 2006-2008 as pre-TARP lending, while loans originated in 2009-2011 as post-TARP lending. We follow the equation (3) in the regression.

$$\frac{\Delta loan_{i,k,(t,t-1)}}{Asset_{i,k,t-1}} = \alpha_0 + \alpha_1 TARP_k + \alpha_2 Bank\ characteristics_{k,t-1} \times TARP_k + \alpha_3 Past\ lending\ relationship_{i,k} + \gamma F_i + \varepsilon_{i,t}. \quad (3)$$

We scale the change in lending by the ex-ante total asset of the sample firm. The key independent variable is *TARP* which equals to one if the bank is a TARP bank, and zero otherwise. We further interact the dummy with ex-ante bank characteristics and ex-post change in liquidity with the goal to further disentangle the channel of effects.

In particular, a big concern in testing the supply of credit is the failure to disentangle the demand side effect with the supply side effect. In other words, the difference in changes in access to credit may simply reflect the change and difference in credit demand between TARP firms and non-TARP firms. We follow Khwaja and Mian (2008) and Giannetti and Simonov (2012) which design the tests to resolve the issue as well as to control the firms' unobserved heterogeneity and to avoid the selection problems. Also, past lending relationship between firm i and bank k is controlled in the regression.

The results on supply of credit are shown in Table 6. In column 1 panel A, we first show a significant reduction in supply of credit of TARP banks in the post-bailout period (2009-2011). This translates to an approximate 14% (=0.003/0.022) reduction in supply of credit from TARP bank. Next, we add several bank characteristic variables as well as their interaction terms with TARP bank dummy into the model. According to the hypothesis, more financially healthy banks should experience less reduction in supply of credit. Financial health could be captured through ex-ante tier one capital ratio and net interest profit margin. The results in Table 5 are consistent with the conjecture that we find that banks with higher ex-ante tier one capital ratio

and ROA are associated with smaller reductions in supply of credit to their client firms.

Moreover, consistent with findings in announcement effect, the larger the bank in size, the larger reduction in supply of credit from TARP banks in the post-TARP period. In addition, we also show that larger increases in post-injection liquid asset holding and tier 1 capital ratio are associated with larger reductions in TARP banks' supply of credit. The results suggest that aided banks withhold the cash in post injection period is closely linked to the significant reduction in their credit supply to their client firms.

We repeat the tests using one to one and one to five matching subsamples respectively and results are shown in panel B and C of Table 6. Consistent results as those in the full sample are found in subsamples.

Overall, findings in Table 6 confirm earlier findings on announcement effect, suggesting that supply of credit is a key channel to lead to valuation losses of TARP firms. In specific, the results show that the worse financial conditions of the TARP bank, e.g. low tier 1 capital ratio, low ROA, and lower cash holding, the larger reduction in credit supply to borrower firms, which could be the essential driver of valuation loss of TARP firms at TARP approval announcement of their main banks.

Furthermore, a simple difference-in-difference (DID) regression is adopted to test the impact of TARP on firm's capital structure. The model is specified as equation (4):

$$\frac{Bank\_debt_{i,t}}{Asset_{i,t}} = \alpha_0 + \alpha_1 TARP_k + \alpha_2 Post\ dummy_t \times TARP_k + \gamma F_i + \varepsilon_{i,t}. \quad (4)$$

where the dependent variables are the total amount of bank debt of firm i at year t scaled by firm's total asset. $Exposure\_to\_TARP\_bank(dummy)_i$ equals to one if firm i

has any TARP banks as their main bank prior to October 2008, and zero otherwise. $Post\ dummy_t$ equals to one if the fiscal year of the firm financial observation is from 2009 to 2011, and zero if fiscal year is between 2006 to 2008. Firm size, market-to-book, interest coverage, and ROA are controlled in the regressions as well.

Table 7 shows that exposure to TARP bank is associated with a significant reduction in the proportion of bank debt as of the firm's capital structure. Particularly, the coefficient on the interaction term between $Post\ dummy$ and $Exposure\_to\_TARPdummy$ is negative and significant in full sample, suggesting that the degree of reliance on bank credit for TARP firms is significantly dropped which could be primarily due to TARP banks' cutting off supply of credit as shown in Table 5. Likewise, results in one to five matched subsample is qualitatively same to the full sample case, further reinforce our earlier findings.

Taken together, results in Table 7 and 6 support the conjecture that TARP participation reflects adversely of a bank's financial health. In particular, we point out that the supply of credit serves as a key channel to explain the transmission of negative information of banks to client firms. As TARP banks subsequently reduce their credit supply, TARP firms are forced to rely on more other sources of funding which is more expensive comparing to bank credit. As a result, these firms will suffer from credit drain in spite of the government capital injection, because TARP banks will reserve the bailout money to solve their own financial problems rather than lending out. In turn, this could explain why at the TARP approval announcement, TARP firms suffer valuation losses.

5.4 Financial Flexibility

The next question examined in the paper is whether TARP firms become more financially constrained after government capital injection into their main banks. Two things are tested in the paper: cash flow sensitivity of cash and investment. Almeida et al (2004) articulate that financial constraint firms are more likely to save cash out of cash flow. The cash flow sensitivity of cash can be free from the Kaplan-Zingales criticism and better capture the financial constraint because the explanatory power of cash flow over cash policy is less likely to link to future investment demand. Following their argument, we investigate whether these TARP firms became more financially constrained after their main banks' participation in TARP with cash flow sensitivity to cash measure. We follow equation (5) to examine the effect.

$$\Delta Cash\ to\ asset_{i,t} = \alpha_0 + \alpha_1\ TARP_i + \alpha_2\ Post\ dummy_t \times TARP_i + \alpha_3\ TARP_i \times Cashflow_{i,t} + \alpha_4\ TARP_i \times Post\ dummy_{i,t} \times Cashflow_{i,t} + \alpha_5\ Post\ dummy_{i,t} \times Cashflow_{i,t} + \alpha_6\ Cashflow + \gamma F_i + \delta I + \theta Y + \varepsilon_{i,t}. \quad (5)$$

In panel A of Table 8, we first examine the effect of TARP injection on firm cash flow sensitivity of cash in the full sample. We use difference-in-difference regressions with three measures of firm level exposure to TARP injection. The coefficient of triple interaction term α_4 is the variable of interest and our hypothesis predicts a positive coefficient. Across the regressions with different measures of exposure to TARP, we find consistently positive and significant coefficients, suggesting that TARP firms become more financially constrained in the post-TARP period. This result reinforces previous evidence which suggests that banks reduce the credit supply after participating in TARP, resulting in client firms suffering from financial constraint afterwards.

Alternatively, the sample is divided into two groups, namely TARP firm (treatment) and non-TARP firm (control). We re-estimate the effect of TARP injection on firm's cash flow sensitivity of cash followed the model employed by Almeida et al (2004) as equation (6):

$$\Delta Cash\ to\ asset_{i,t} = \alpha_0 + \alpha_1\ Cashflow_{i,t} + \alpha_2\ Post\ dummy_{i,t} \times Cashflow_{i,t} + \gamma F_i + \delta I + \theta Y + \varepsilon_{i,t}. \quad (6)$$

where α_1 captures the effect of financial constraint on cash flow sensitivity on cash. In addition, the hypothesis predicts that $\alpha_2 > 0$, that is TARP firms became more financially constrained after relationship banks' participation in TARP. Other firm characteristics, such as market-to-book, leverage, and size are controlled in the regressions. Industry and year fixed effects are added in to take account of potential omitted variable problems.

Both full sample and subsamples obtained from propensity score matching at main bank level are tested. The results are reported in panel B of Table 8. Across the different samples, we find TARP firms experience significantly increases in cash flow sensitivity of cash in the post-TARP period, whereas control firms experience slight but insignificant reductions in cash flow sensitivity of cash in post-TARP period. Findings in panel B reinforce the earlier evidence shown in panel A, suggesting that the TARP firms become more financially constrained even after government's capital injection to their main banks.

Furthermore, we examine the investment of TARP firms. The empirical specification is based on the q-theory, which suggests that investment is a function of marginal Q ratio which can be proxied by market-to-book ratio. We augment the model with firm specific financial variables such as internal cash flow (Fazzari et al (1988)), value of investment in previous year, while year and firm fixed effects to

account for unobservable time and firm heterogeneity. Firm investment is measured with capital expenditure and the regression details are specified in equation (7):

$$Capital\ Investment_{i,t} = \alpha_0 + \alpha_1\ Capital\ Investment_{i,t-1} + \alpha_2\ TARP_i + \alpha_3\ Post\ dummy_{i,t} \times TARP_i + \gamma F_i + \delta I + \theta Y + \varepsilon_{i,t}. \quad (7)$$

where i refers to firm i and t refers to fiscal year t. Three measures of firm's exposure to TARP are adopted in the estimations. Post dummy equals to one if the fiscal year of the firm financial observation is from 2009 to 2011, and zero if fiscal year is between 2006 and 2008.

Variables of firm characteristics are motivated by existing literature. For example, cash flow is motivated by the large literature showing an association of cash flow with investment, which is usually interpreted as evidence of financial constraints having an impact on firm investment. Firms with high leverage are also likely to be more financially constrained or distressed. Firm size is posited to be inversely related to financial constraint, while ROA is deemed as an alternative proxy for future growth opportunities, although a high ROA could also mean that the firm has more cash at its disposal and therefore less financially constrained. Under both interpretations of ROA, one should expect a positive impact on investment.

Table 9 provides the results on firm investment. In Model (1), the estimated coefficients on the interacted $Post\ dummy_{i,t} \times TARP_i$ are negative and significant at the 5% level across three specifications, suggesting that TARP firm actually reduce their capital investment after their main banks participating in TARP. The coefficient on is -0.6%, which could be translated into a 9% (0.006/0.067) reduction in capital investment. We argue that the results support the conjecture that TARP firms reduce investment activities after their main banks participating in TARP as they become more financially constrained.

Subsample robustness checks are also provided in Table 8. Both in one to one and one to five matched subsamples, coefficients of interaction term between TARP and post dummy are negative. The significance level of the point estimates increases from 5% to 1% in one to five matched subsample, whereas due to the limited number of control firms, the significance of the coefficient estimation drops.

In addition, the coefficients on market-to-book are positive and significant in full sample estimations. The positive and significant coefficient on cash flow reflects that firms are sensitive to cash flow fluctuations, suggesting that financial frictions do play a role in deterring firm investment.

Furthermore, we re-examine above results by stratifying firms based on various measures of financial constraints and distress risk and the results are showing in Table 10. The following measures are adopted: a measure of the firm's financial constraints, computed based on size, leverage, and White and Wu (2006. Small size, high leverage, and high WW ratio suggest a firm is more financially constrained. Note that leverage could proxy for financial constraints as well as financial distress. Sub-sample specifications are adopted instead of a single regression with interaction effects, for three reasons: (1) with a total of 7 variables of interests in the regression, it raise concerns of multicollinearity and difficulties in interpretation of the marginal effects; (2) due to industry and year fixed effects, marginal effects are hard to compute even in the absence of multicollinearity; (3) sub-sample regressions allow variations in estimations of other control variables in different sub-samples.

In panel A, we first present the results with the binary measure of firm's exposure to TARP. To highlight the variable of interest – the interaction term between exposure to TARP and post-TARP dummy, only the estimates of this variable of interest is reported in the table. In general, the results are consistent

with the conjecture that more financially constrained firm response more to TARP exposure by reducing their investment. In all cases, the marginal effects of TARP exposure are larger for constrained firms than unconstrained firms. For example, the marginal effect of TARP for firms with higher Whited and Wu (2006) is about -12%. We argue that the difference is economically significant. In panel B and C, we use the other two TARP exposure measures to re-examine the effects and similar results are found as panel A.

Overall, the results in Table 10 and 9 suggest that firms significantly reduce their capital investment after their main banks' participation in TARP. Together with previous findings on cash flow sensitivity, it suggests that TARP firms suffer from financial constraint regardless of the capital injection to their main bank. Moreover, combining with earlier results on supply credit, we argue that firms' financial constraint is largely driven by the TARP banks' reduction in credit supply. All of these subsequent real effects experienced by TARP firms explain the observed valuation losses and provide further evidence of the existence and transmission of negative information about TARP participants to their clients.

6. Conclusions

In this paper, we systemically investigate the effect of TARP on the participated banks' client firms and find that firms which strongly rely on TARP banks suffer a significant valuation loss around TARP approval announcements of their relationship banks. In addition, the magnitude in valuation reduction is negatively related to TARP banks' ex-ante financial health. The findings are interpreted as being consistent with the proposed the hypothesis, which states that TARP firms suffer from adverse signalling of their main banks' participation in government

bailout without sharing the benefit arising from it, whereas aided banks could effectively internalize the cost and benefits associated with government intervention.

In addition, we find that empirical evidence suggesting that TARP banks do reduce supply of credit and those with poorer financial health experience larger reduction. These results suggest a potential source of valuation loss and further confirm the hypothesis. Lastly, we examine whether TARP firms become more financially constrained subsequently. We find TARP firms become more financially constrained, suggested by an increase in cash flow sensitivity in post-TARP period. In addition, in response to the decrease in credit supply, we find that firms choose to cut their capital expenditures, especially for those small and financial constrained firms.

Overall, empirical evidences found in this paper suggest that TARP fails to achieve its broader statutory goal that is to ease credit crunch and enhance liquidity in the economy, even though many anecdotal evidences do suggest that TARP has largely strengthened the financial sector. More importantly, this paper points out a potential source of welfare loss associated with government rescue program which have not been well documented and discussed in the literature. In fact, many future researches could be explored in the area built on the findings uncovered in this paper in order to arrive at a more complete understanding of government rescue program.

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Appendix 1: Variable Definitions and Constructions

Variables	Definitions
Main bank	Among all the relationship banks of a specific firm, the bank or banks that has the highest banking relationship with the firm.
TARP firms	Public firms have TARP banks as their main bank.
Non-TARP firms	Public firms that are not classified as TARP firms but fulfil sample requirements
Panel A: Measures of Connections	
TARP (Dum)	In announcement effect regressions, it equals to 1 if there is loan from TARP bank k to TARP firm i in the past 5 years prior to the bank k's TARP approval announcement, and zero otherwise. In real effect regressions, it equals to 1 if its main bank is TARP bank, and zero otherwise.
TARP (Amt)	In announcement effect regressions, it equals to the lending relationship (calculated from lending amount) of a firm with any of its main bank which received approval to TARP on a certain announcement date. In real effect regressions, it equals to the aggregate lending relationship (calculated from lending amount) with all of with all of its main banks which received TARP.
TARP (Num)	In announcement effect regressions, it equals to the lending relationship (calculated from number of lending) of a firm with any of its main bank which received approval to TARP on a certain announcement date. In real effect regressions, it equals to the aggregate lending relationship (calculated from number of lending) with all of with all of its main banks which received TARP.
Round 1	Equals to 1 if TARP announcement is on Oct. 14, 2008, and zero otherwise.
Round 2	Equals to 1 if TARP announcement is between Oct. 21, 2008 and Nov. 14, 2008, and zero otherwise.
Round 3	Equals to 1 if TARP announcement doesn't belong to either round 1 or round 2, and zero otherwise.
Post dummy	Equals to 1 if fiscal year is later than 2008, and zero otherwise.
Panel B: Measures of Financial Characteristics	
Firm size	Natural logarithm of book value of total assets. Calculated from Compustat data as ln(at).
Market value of equity	End of fiscal year closing stock price (prcc_f) multiplied by total shares outstanding (csho).
Market-to-book (M/B)	Calculated from Compustat data as (at-ceq-txdb+prcc_f*csho)/at.
Cash/assets	Calculated from Compustat data (ch/at)
Market leverage	Book value of debts over market value of total assets. Calculated from Compustat data as (dltt+dlc)/(dltt+dlc+prcc_f*csho).
Book leverage	Book value of debts over book value of total assets. Calculated

	from Compustat data as(dltt+dlc)/at
Interest coverage(INTCOV)	EBIT over interest expense. Calculated from Compustat data as (ebit/xint)
ROA	Operating income before depreciation, scaled by book value of total assets. Calculated from Compustat data as (ebitda/at)
Working capital ratio	Current asset/current liabilities. Calculated from Compustat data as (act/lct).
Sales growth	Percentage change in sales over the prior fiscal year.
R&D/assets	R&D value over total asset. Calculated from Compustat data as (xrd/at). Missing R&D value is considered to equal zero.
Capital investment	Calculated from Compustat data as (capex/at).
Cost of goods sold/assets	Calculated from Compustat data as (cogs/at).
Cash flow	Operating cash flow divided by total asset in year t-1 (oancf/l.at)
Industry classification	Fama-French 48 industry classification.
Panel C: Measures of Bank Characteristics	
Bank size	Calculated from Bankscope data as ln(data2025)
Tier 1 capital ratio	Obtained from Bankscope data (data2130), which is calculated as tier 1 capital over risk weighted asset value
ROA	Calculated from Bankscope data as (data2115/data2025)
Cash holding	Calculated from Bankscope data as (data5580/data2025)
Loan loss provision	Calculated from Bankscope data as (data2095/data2001)
Liquid asset/Total asset	Obtained from Bankscope data as (data2075/data2025)
Δ tier 1 ratio	Obtained from Bankscope data as (data2130 – Lag(data2130))
Δ cash holding	Obtained from Bankscope data as (data5580– Lag(data5580)) /Lag(data5580)

Table 1 Summary Statistics

This table reports the summary statistics of our sample firms. Financial characteristics reported are the average of year 2006 and 2007. All the firms are required to have non-missing total asset. Financial and utility firms are deleted in the sample. Panel A and panel B reported the descriptive statistics for treatment and control sample respectively. Treatment refers to firms which have any TARP recipient bank as their main bank, whereas control refers to firms which have no TARP aided bank as the main bank. Detailed definitions of variables are shown in the appendix.

	No. Firm.	Mean	Median	Std. Dev.
Panel A Treatment				
Total asset	1,402	5,751	1,178	15,843
Market value of equity	1,402	6,578	1,241	17,453
Market-to-book	1,342	1.86	1.56	0.98
Cash/asset	1,395	8.56%	5.59%	8.81%
Market leverage	1,398	0.22	0.17	0.18
Book leverage	1,398	0.24	0.22	0.19
Working capital ratio	1,367	2.05	1.79	1.21
Interest coverage	1,330	40.98	6.07	166.00
R&D/asset	1,402	2.11%	0.00%	4.37%
Capex/asset	1,402	6.31%	3.91%	7.00%
ROA	1,401	0.13	0.13	0.10
COGS/asset	1,402	0.82	0.67	0.64
Sale growth	1,399	1.14	1.10	0.22
Bank debt/asset	893	11.60%	70.50%	17.60%
Bank debt/total debt	882	46.65%	40.73%	36.77%
Undrawn credit line ratio	214	67.50%	72.50%	28.70%
Panel B Control				
Total asset	610	7,763	949.70	21,851
Market value of equity	610	8,204	953.70	21,743
Market-to-book	595	1.88	1.61	0.97
Cash/asset	606	9.89%	6.12%	10.5%
Market leverage	610	0.22	0.18	0.20
Book leverage	610	0.27	0.23	0.21
Working capital ratio	599	2.07	1.70	1.37
Interest coverage	581	29.86	4.79	146.20
R&D/asset	610	2.96%	0.00%	5.99%
Capex/asset	608	7.72%	4.79%	8.24%
ROA	608	0.12	0.12	0.11
COGS/asset	610	0.66	0.49	0.63
Sale growth	606	1.20	1.14	0.28
Bank debt/asset	311	17.00%	10.20%	20.50%
Bank debt/total debt	308	58.71%	66.33%	38.75%
Undrawn credit line ratio	59	64.90%	71.80%	2.71%

Table 2 Bank Characteristics

This table reports the descriptive statistics of our sample banks. All these variables are calculated based on the mean value during 2006 to 2007, which is before the announcement of TARP.

	N	Mean	Median	St. Dev.	Min	Max
Panel A: TARP Banks						
Size	38	10.07	10.76	2.48	5.96	13.89
Tier 1 Capital	38	9.19%	8.95%	4.09%	0.00%	22.05%
Loan to asset ratio	38	62.11%	71.08%	20.87%	1.64%	83.42%
ROA	38	1.04%	1.08%	0.53%	-0.36%	2.81%
Nonperforming loan to total loan	38	0.68%	0.52%	0.66%	0.00%	3.88%
Margin	38	3.22%	3.25%	1.08%	0.46%	4.98%
Loan loss provisions	38	0.45%	0.31%	0.50%	-0.04%	2.01%
Liquid asset ratio	38	10.60%	4.67%	12.70%	1.70%	42.50%
Cash to asset	38	2.61%	2.47%	1.44%	0.07%	8.32%
Leverage	38	0.89	0.90	0.05	0.65	0.97
Deposit to asset ratio	37	0.65	0.69	0.18	0.09	0.88
Panel B: Non-TARP Banks						
Size	300	9.71	9.75	2.63	5.30	13.89
Tier 1 Capital	303	9.15%	8.76%	6.79%	0.00%	26.85%
Loan to asset ratio	303	52.94%	57.90%	21.65%	1.64%	83.42%
ROA	303	0.89%	0.76%	0.80%	-0.36%	2.81%
Nonperforming loan to total loan	303	1.82%	0.96%	2.05%	0.00%	6.75%
Margin	290	2.25%	2.02%	1.27%	0.46%	4.98%
Loan loss provisions	303	0.40%	0.22%	0.53%	-0.04%	2.01%
Liquid asset ratio	300	17.40%	12.10%	14.60%	1.70%	52.40%
Cash to asset	267	2.64%	1.75%	2.86%	0.07%	10.50%
Leverage	300	0.90	0.92	0.08	0.65	0.97
Deposit to asset ratio	281	0.64	0.71	0.23	0.09	0.90

Table 2 Stock Price Reactions to TARP

Abnormal returns of firms around TARP approval announcement date are reported in this table. Summary statistics of treatment and control groups are reported respectively. Treatment group include firms which have their main bank received approval to TARP on a certain event date, whereas control group include firms which have none of their main bank received approval to TARP on the specific event date. Median of cumulative abnormal returns (CARs) are reported. We require sample firms to be non-financial and non-utility firms. 3-day, 21-day and 12-day event windows are implemented in computing CAR. We use a 260-day estimation window, i.e. [Day -290, Day -31] and require firms to have non-missing returns on all days during the period from day -5 to day +5. Mean CAR and t-statistics are reported. Different models in calculating CARs are adopted. Panel A shows results of full sample, whereas panel B report results of propensity score matched subsample. Propensity score matching is conducted at bank level based on bank financial characteristics obtained from Bankscope data base. Various model specifications are considered, including market model, Fama-French Three-Factor model and Four-Factor model. Wilconxon rank test are conducted on median CARs and significance between groups are reported in the last column. ***, ** and * indicate statistically significant at 1%, 5% and 10% level respectively.

Panel A Full Sample

	(1) Treatment group		(2) Control group		Difference
	Median CAR	Significance	Median CAR	Significance	
Number of Observations	1,475		12,682		
Panel A1: Market Model Adjusted Abnormal Returns					
(-1, +1)	-3.01%	***	-1.09%	***	***
(-10, +10)	-10.32%	***	0.34%	***	***
(-10, +1)	-5.45%	***	-0.91%	***	***
Panel A2: Fama-French Three-Factor Model Adjusted Abnormal Returns					
(-1, +1)	-0.38%		-0.76%	***	
(-10, +10)	-3.74%	***	0.23%		***
(-10, +1)	-2.60%	***	-1.04%	***	***
Panel A3: Fama-French Four-Factor Model Adjusted Abnormal Returns					
(-1, +1)	-0.46%		-0.77%	***	
(-10, +10)	-4.10%	***	0.26%		***
(-10, +1)	-2.76%	***	-1.00%	***	***

Panel B Propensity-Score-Matched Subsamples

	(1) Treatment group		(2) Control group		Difference
	Median CAR	Significance	Median CAR	Significance	
Number of Observations	1,456		1,329		
Panel B1: Market Model Adjusted Abnormal Returns (1:1 matching)					
(-1, +1)	-3.01%	***	-0.72%	***	***
(-10, +10)	-10.37%	***	1.15%		***
(-10, +1)	-5.53%	***	-0.68%	***	***
Number of Observations	1456		9157		
Panel B2: Market Model Adjusted Abnormal Returns (1:5matching)					
(-1, +1)	-3.01%	***	-1.11%	***	***
(-10, +10)	-10.37%	***	0.22%		***
(-10, +1)	-5.53%	***	-0.96%	***	***

Table 3 TARP Announcement Effect

This table provides the results of OLS regression on firms' abnormal returns around TARP approval announcements. The dependent variable is CAR (-1, +1) around sample banks' TARP approval announcement date calculated from adjusted market model with a 260-day estimation window, i.e. [Day -290, Day -31] and require firms to have non-missing returns on all days during the period from day -5 to day +5. Main independent variables include exposure to TARP approval, and its interaction terms with TARP round dummy. Three measures of exposure to TARP approval are constructed based on the past 5-year lending relationship with banks on their TARP approval. Please note lending relationship is considered only the bank is firm's main bank. Firm characteristics are controlled in the regression. Panel A shows the full sample regressions with all the non-financial and non-utility firms in CRSP and Compustat with borrowing activities from Dealscan between 2003 to Oct. 2008. In panel B and C, propensity score matched subsample are tested followed the similar models. Propensity score matching is conducted at bank level based on bank financial characteristics obtained from Bankscope data base. Details of variable definitions are stated in the appendix. Robust standard errors reported in the parentheses are clustered at bank and announcement date . Industry fixed effects are controlled. ***, ** and * indicate statistically significant at 1%, 5% and 10% level respectively.

Panel A Full sample

	CAR(-1,+1)				
	(1)	(2)	(3)	(4)	(5)
Exposure to TARP (Dum)	-0.012***	-0.013***			
	(0.004)	(0.004)			
Exposure to TARP (Amt)			-0.015***		
			(0.005)		
Exposure to TARP (Num)				-0.015***	
				(0.005)	
Exposure to TARP (Dum)× Round 1					-0.011**
					(0.005)
Exposure to TARP (Dum)× Round 2					-0.023***
					(0.006)
Exposure to TARP (Dum)× Round 3					0.030
					(0.037)
Cash		0.006	0.006	0.006	0.006
		(0.012)	(0.012)	(0.012)	(0.012)
M/B		0.000	0.000	0.000	0.000
		(0.002)	(0.002)	(0.002)	(0.002)
SIZE		0.001	0.001	0.001	0.001
		(0.001)	(0.001)	(0.001)	(0.001)
ROA		-0.022**	-0.022**	-0.022**	-0.022**
		(0.010)	(0.010)	(0.010)	(0.010)
LEV		-0.022*	-0.022*	-0.022*	-0.022*
		(0.013)	(0.013)	(0.013)	(0.013)
INTCOV		0.000	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.018***	-0.021**	-0.028***	-0.028***	-0.024**
	(0.004)	(0.010)	(0.010)	(0.010)	(0.010)
Obs.	13,812	13,341	13,341	13,341	13,341
Industry Fixed Effected	Yes	Yes	Yes	Yes	Yes
2-way cluster at bank and announcement date	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.008	0.009	0.009	0.009	0.009

Panel B Propensity score matching (1:1 matching)

	CAR(-1,+1)				
	(1)	(2)	(3)	(4)	(5)
Exposure to TARP (Dum)	-0.010**	-0.011**			
	(0.005)	(0.005)			
Exposure to TARP (Amt)			-0.012**		
			(0.005)		
Exposure to TARP (Num)				-0.012**	
				(0.005)	
Exposure to TARP (Dum)× Round 1					-0.009*
					(0.005)
Exposure to TARP (Dum)× Round 2					-0.023***
					(0.006)
Exposure to TARP (Dum)× Round 3					0.032
					(0.038)
Other controls	No	Yes	Yes	Yes	Yes
Observations	8,401	8,198	8,198	8,198	8,198
Industry Fixed Effected	Yes	Yes	Yes	Yes	Yes
2-way cluster at bank and announcement date	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.008	0.008	0.008	0.008	0.009

Panel C Propensity score matching (1 : 5 matching)

	CAR(-1,+1)				
	(1)	(2)	(3)	(4)	(5)
Exposure to TARP (Dum)	-0.011**	-0.013***			
	(0.005)	(0.005)			
Exposure to TARP (Amt)			-0.014***		
			(0.005)		
Exposure to TARP (Num)				-0.014**	
				(0.005)	
Exposure to TARP (Dum)× Round 1					-0.011**
					(0.005)
Exposure to TARP (Dum)× Round 2					-0.023***
					(0.006)
Exposure to TARP (Dum)× Round 3					0.031
					(0.038)
Other controls	No	Yes	Yes	Yes	Yes
Obs.	10,613	10,199	10,199	10,199	10,199
Industry Fixed Effected	Yes	Yes	Yes	Yes	Yes
2-way cluster at bank and announcement date	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.008	0.009	0.009	0.009	0.009

Table 4 Bank Characteristics and Announcement Effect

This table provides results on the effect of bank characteristics on relationship firms' abnormal returns around the announcements of their approval to TARP. Dependent variable is CAR (-1, +1) around banks' approval announcement date calculated from adjusted market model with a 260-day estimation window, i.e. [Day -290, Day -31]. Further, we require firms to have non-missing returns on all days during the period from day -5 to day +5. The sample only contains all the firms with exposure to certain TARP approvals, measured based on the past 5-year lending relationship with TARP banks. Bank's ex-ante characteristics, calculated as average of 2006 and 2007 are incorporated. In addition, firm characteristics, including total asset, cash/asset, leverage, market-to-book, ROA and interest coverage are controlled in all regressions. Robust standard errors reported in the parentheses are clustered at bank and announcement date levels respectively. Industry fixed effects are controlled. ***, ** and * indicate statistically significant at 1%, 5% and 10% level respectively.

	CAR(-1,+1)				
	(1)	(2)	(3)	(4)	(5)
Exposure to TARP (Dum)	-0.016***	-0.017***	-0.018***	-0.011***	-0.014***
	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)
Exposure to TARP (Dum)×Injection Size	0.238				
	(0.181)				
Exposure to TARP (Dum)×Tier 1 ratio		0.001***			
		(0.000)			
Tier 1 ratio		-0.000			
		(0.000)			
Exposure to TARP (Dum)×Bank ROA			0.460***		
			(0.160)		
Bank ROA			-0.464***		
			(0.144)		
Exposure to TARP (Dum)×ΔTier 1				-0.001	
				(0.001)	
ΔTier 1				0.000*	
				(0.000)	
Exposure to TARP (Dum)×Δliquid asset					-0.039**
					(0.017)
Δ liquid asset					0.001
					(0.012)
Other controls	Yes	Yes	Yes	Yes	Yes
Obs.	13341	13341	12293	13341	11064
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
2-way clustered at bank and announcement date	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.013	0.007	0.011	0.009	0.009

Table 5 TARP Repayment Effect

This table provides the results of OLS regression on firms' abnormal returns around TARP repayment announcements. The dependent variable is CAR (-1, +1) around sample banks' TARP repayment announcement date calculated from adjusted market model with a 260-day estimation window, i.e. [Day -290, Day -31] and require firms to have non-missing returns on all days during the period from day -5 to day +5. Main independent variables include exposure to TARP approval, and its interaction terms with TARP round dummy. Three measures of exposure to TARP approval are constructed based on the past 5-year lending relationship with banks on their TARP approval. Please note lending relationship is considered only the bank is firm's main bank. Firm characteristics are controlled in the regression. The sample consists of all the non-financial and non-utility firms in CRSP and Compustat with borrowing activities from Dealscan between 2003 to Oct. 2008. Details of variable definitions are stated in the appendix. Robust standard errors reported in the parentheses are clustered at bank and announcement date . Industry fixed effects are controlled. ***, ** and * indicate statistically significant at 1%, 5% and 10% level respectively.

	(1)	(2)	(3)	(4)
	Car(-1,+1)	Car(-1,+1)	Car(-1,+1)	Car(-1,+1)
Exposure to TARP bank approval (Dummy)	0.011	0.011		
	(0.008)	(0.008)		
Exposure to TARP bank approval (Amount)			0.013	
			(0.009)	
Exposure to TARP bank approval (Number)				0.013
				(0.009)
Other controls	No	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
Cluster by event date and parent bank	Yes	Yes	Yes	Yes
Obs.	11242	10797	10797	10797
Adj. R-square	0.008	0.008	0.008	0.008

Table 6 Supply of Credit and TARP Injection

Table 5 reports the effect of TARP inception on bank's supply of credit to firms. Sample period starts from 2006 and end in 2011. Dependent variables reflect the change of the 3-year total lending amount from bank k to firm i before and after the TARP injection. We create a panel with bank-firm pairs, out of 2,012 sample firms and 342 sample banks. Dependent variables is the difference in loan amount of firm i from bank k before and after TARP injection. It is calculated as firm total lending from bank k to firm i in 2009-2011 minus the total lending amount from bank k to firm i in 2006-2008, and scaled by average total asset of the firm in 2006 and 2007. TARP bank dummy equals to 1 if the bank is a TARP recipient bank, and zero otherwise. Interaction terms between TARP bank dummy and the bank characteristics are included in the regressions respectively. In panel A, we first examine the effects with full sample, while in panel B and C, we examine the subsamples. In addition, past lending relationship between the firm and the bank in the last 5 years is also controlled. We follow Khwaja and Mian(2008) to control for demand side effect with firm fixed effects. Robust standard errors standard errors are corrected for within-firm clustering. Details of variable definitions are stated in the appendix. ***, ** and * indicate statistically significant at 1%, 5% and 10% level respectively. Standard errors are reported in the parentheses.

Pane A Full Sample	Δ Loan$_{i,k,(t,t-1)}$ / Asset$_{t-1}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TARP bank dummy	-0.003***	-0.003***	-0.016***	-0.004***	-0.002***	-0.002***	-0.001
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Injection size		0.015***					
		(0.005)					
TARP bank dummy×Tier 1 ratio			0.137***				
			(0.020)				
Tier 1 ratio			0.001**				
			(0.000)				
TARP bank dummy×Bank ROA				0.080*			
				(0.048)			
Bank ROA				0.002**			
				(0.001)			
TARP bank dummy×Δ tier 1 capital					-0.007***		-0.007***
					(0.001)		(0.001)
Δ tier 1capital					-0.000		-0.000
					(0.000)		(0.000)
TARP bank dummy×Δ Liquid asset						-0.025**	-0.029***
						(0.010)	(0.010)
Δ Liquid asset						0.003***	0.001**
						(0.001)	(0.001)
Past 5-yr lending relationship (Amt)	-0.476***	-0.477***	-0.457***	-0.478***	-0.467***	-0.481***	-0.480***
	(0.025)	(0.025)	(0.026)	(0.025)	(0.028)	(0.025)	(0.026)
Constant	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs.	681,729	681,729	559,058	669,663	490,684	611,344	490,684

Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at firm level	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.069	0.069	0.064	0.070	0.066	0.071	0.066

Pane B 1:1 matching	Δ Loan$_{i,k,(t,t-1)}$ / Asset$_{t-1}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TARP bank dummy	-0.003***	-0.004***	-0.016***	-0.005***	-0.002***	-0.003***	-0.001
	(0.001)	(0.001)	(0.002)	(0.001)	(0.000)	(0.001)	(0.001)
Injection size		0.021***					
		(0.007)					
TARP bank dummy×Tier 1 ratio			0.140***				
			(0.022)				
TARP bank dummy×Bank ROA				0.140**			
				(0.063)			
TARP bank dummy×Δ tier 1 capital					-0.006***		-0.006***
					(0.002)		(0.002)
TARP bank dummy×Δ Liquid asset						-0.034***	-0.037***
						(0.012)	(0.013)
Obs.	492,228	492,228	403,656	483,516	354,288	441,408	354,288
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at firm level	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.067	0.067	0.065	0.069	0.068	0.069	0.068

Pane C 1:5 matching	Δ Loan$_{i,k,(t,t-1)}$ / Asset$_{t-1}$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TARP bank dummy	-0.003***	-0.003***	-0.016***	-0.004***	-0.002***	-0.002***	-0.001
	(0.001)	(0.001)	(0.002)	(0.001)	(0.000)	(0.001)	(0.001)
Injection size		0.016***					
		(0.006)					
TARP bank dummy×Tier 1 ratio			0.136***				
			(0.021)				
TARP bank dummy×Bank ROA				0.094*			
				(0.051)			
TARP bank dummy×Δ tier 1 capital					-0.006***		-0.006***
					(0.001)		(0.001)
TARP bank dummy×Δ Liquid asset						-0.027***	-0.031***
						(0.010)	(0.011)

Obs.	624,438	624,438	512,076	613,386	449,448	559,968	449,448
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster at firm level	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-square	0.068	0.068	0.064	0.071	0.067	0.070	0.067

Table 7 Financing Structure and TARP Injection

This Table reports the impact of bank's participation in TARP on their relationship firms' financing structure. Sample period is from 2006 to 2011. Total bank debt over firm total asset is used as dependent variable in the analyses. For independent variable, exposure to TARP dummy equals to one if any TARP recipient bank is the main bank of the firm, and zero otherwise. Post-TARP dummy equals to one if fiscal year is after 2009, (including 2009), and zero otherwise. Interaction term of above two dummies is included in the regression. Firm financial characteristics are controlled in the regression. Rating dummy equals to one if it has a S&P domestic long term issuer credit rating, and zero otherwise. Estimates of coefficient for interest coverage are multiplied by 100. Industry and year fixed effects are controlled. Robust standard errors corrected for within-firm clustering are reported in the parentheses. Details of variable definitions are stated in the appendix. ***, ** and * indicate statistically significant at 1%, 5% and 10%level respectively.

	Total bank debt/Asset		
	Full sample	1:1 match	1:5 match
Exposure to TARP (Dum)	-0.043***	-0.018	-0.043***
	(0.011)	(0.023)	(0.013)
Exposure to TARP (Dum) x Post dummy	-0.016**	-0.023	-0.018**
	(0.007)	(0.018)	(0.008)
Size	-0.026***	-0.029***	-0.026***
	(0.003)	(0.004)	(0.003)
M/B	0.002	0.002	0.003
	(0.008)	(0.008)	(0.008)
INTCOV	-0.035***	-0.030***	-0.035***
	(0.004)	(0.003)	(0.004)
ROA	0.055	0.028	0.064
	(0.052)	(0.057)	(0.053)
Rating dummy	0.016	0.026**	0.018
	(0.012)	(0.012)	(0.012)
Observations	6,601	5,068	6,156
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Clustered at firm level	Yes	Yes	Yes
Adj. R-square	0.174	0.162	0.170

Table 8 Cash Flow Sensitivity and TARP Injection

Table 7 provides results of effect of TARP injection on relationship firms' cash flow sensitivity to cash. The sample period in this table is from 2006 to 2011. The dependent variable is the changes in cash holding for firm i at year t, scaled by total asset in year t-1. Post-TARP dummy equals to one if fiscal year is after 2009, (including 2009), and zero otherwise. In panel A, we regress the change of cash scale by pre-TARP total asset level on measures of exposure to TARP and their interactions with post-TARP dummy and cash flow post TARP injection. In panel B, we divide the sample firms into two groups, namely treatment and control. Treatment refer to firms which has any of their main bank participated in TARP, whereas control firms are the rest of firms in the sample. Other controls include market-to-book, sales growth, cash flow, size, leverage, cash flow × post dummy, and measures of relationship with TARP bank. Regression results in full sample, propensity score matched subsamples are both reported. Details of variable definitions are stated in the appendix and robust standard errors are corrected for within-firm clustering. Industry and year fixed effects are controlled in the regressions. ***, ** and * indicate statistically significant at 1%, 5% and 10% level respectively.

Panel A

	Δ Cash$_{i(t,t-1)}$ / Asset$_{t-1}$		
VARIABLES	(1)	(2)	(3)
Exposure to TARP (Dum)	0.004		
	(0.004)		
Exposure to TARP (Dum) × Post-TARP dummy	-0.014***		
	(0.005)		
Exposure to TARP (Dum) × Cash flow	-0.094***		
	(0.034)		
Exposure to TARP (Dum) × Cash flow ×Post dummy	0.174***		
	(0.046)		
Exposure to TARP (Amt)		-0.001	
		(0.004)	
Exposure to TARP (Amt) × Post-TARP dummy		-0.008	
		(0.006)	
Exposure to TARP (Amt) × Cash flow		-0.062*	
		(0.038)	
Exposure to TARP (Amt) × Cash flow ×Post dummy		0.156***	
		(0.052)	
Exposure to TARP (Num)			-0.002
			(0.004)
Exposure to TARP (Num) × Post-TARP dummy			-0.007
			(0.006)
Exposure to TARP (Num) × Cash flow			-0.043
			(0.038)
Exposure to TARP (Num) × Cash flow ×Post dummy			0.133**
			(0.053)
Other Controls	Yes	Yes	Yes
Observations	11,114	11,114	11,114
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Clustered at firm level	Yes	Yes	Yes
Adj. R-square	0.129	0.129	0.128
F-stat	50.051	49.388	49.061

Panel B

	Δ Cash$_{i(t,t-1)}$ / Asset$_{t-1}$					
	Full sample		1:1 Matching		1:5 Matching	
	Treatment	Control	Treatment	Control	Treatment	Control
M/B	-0.002	0.008**	-0.008***	0.013**	-0.006***	0.008**
	(0.002)	(0.003)	(0.002)	(0.006)	(0.002)	(0.004)
Cash flow	0.230***	0.301***	0.258***	0.400***	0.291***	0.359***
	(0.023)	(0.031)	(0.022)	(0.146)	(0.026)	(0.042)
Cash flow×Post dummy	0.120***	-0.055	0.102***	-0.122	0.126***	-0.047
	(0.027)	(0.038)	(0.025)	(0.114)	(0.028)	(0.047)
Firm size	0.001*	0.000	0.000	0.002	0.001	0.001
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
Lev	0.017***	0.008	0.011***	0.051*	0.014***	0.013*
	(0.004)	(0.006)	(0.004)	(0.026)	(0.004)	(0.007)
Sales growth	0.012**	0.011	0.011**	0.016	0.013***	0.009
	(0.005)	(0.007)	(0.004)	(0.015)	(0.005)	(0.009)
Constant	-0.033***	-0.040***	-0.021***	-0.076***	-0.037***	-0.053***
	(0.005)	(0.008)	(0.005)	(0.024)	(0.006)	(0.009)
Obs.	7,642	3,472	7,642	327	7,642	2,451
Industry Fix effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Clustered at firm level	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.127	0.130	0.102	0.115	0.114	0.120
F-stat	47.573	22.226	47.638	2.011	40.265	15.600

Table 9 Firm Investment and TARP Injection

Table below provides results of effects of TARP injection on firm investment. The sample period in this table is from 2006 to 2011. Dependent variable is sample firms' capital expenditure scaled by total asset at year t. Independent variables include measures of firm's exposure to TARP recipient banks, post-TARP dummy, and their interaction terms. Other controls include lag of investment, market-to-book, sales growth, and cash flow. Year and industry fixed effects are controlled. Details of variable definitions are stated in the appendix. Robust standard errors are corrected for within-firm clustering. ***, ** and * indicate statistically significant at 1%, 5% and 10% level respectively.

	Capex $_{i,t}$ / Asset $_{t}$				
	Full sample			1:1 Matching	1:5 Matching
Exposure to TARP (Dum) ×Post dummy	-0.006**			-0.006	-0.007***
	(0.003)			(0.006)	(0.003)
Exposure to TARP (Dum)	0.003			0.002	0.005**
	(0.002)			(0.005)	(0.002)
Exposure to TARP(Amt) ×Post dummy		-0.006**			
		(0.003)			
Exposure to TARP(Amt)		0.003			
		(0.003)			
Exposure to TARP(Num) ×Post dummy			-0.005*		
			(0.003)		
Exposure to TARP(Num)			0.002		
			(0.003)		
M/B	0.002**	0.002**	0.002**	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cash flow	0.115***	0.115***	0.115***	0.083***	0.105***
	(0.013)	(0.013)	(0.013)	(0.011)	(0.011)
Size	-0.000	-0.000	-0.000	-0.001*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lev	0.001	0.001	0.001	0.004	0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Sales growth	-0.029***	-0.029***	-0.029***	0.021***	0.022***
	(0.010)	(0.010)	(0.010)	(0.004)	(0.003)
Constant	0.010***	0.028***	0.028***	0.040***	0.004
	(0.003)	(0.004)	(0.004)	(0.007)	(0.003)
Obs.	8,050	8,050	8,050	6,050	7,590
Industry Fix effects	Yes	Yes	Yes	Yes	Yes
Year Fixed effect	Yes	Yes	Yes	Yes	Yes
Cluster at firm level	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.634	0.634	0.634	0.677	0.654
F-stat	132.757	130.090	129.454	122.407	133.596

Table 10 Financial Constraint and Firm Investments

This table reports the effects of TARP on relationship firms' investment. The sample period is from 2006 to 2011 and financial constraints are measured by size, leverage, and Whited and Wu (2006) respectively. Other Controls include lag of investment, market-to-book, sales growth, cash flow, leverage, ROA and size. The estimates of coefficient of three measures of firm's exposure to TARP and post dummy are reported. Industry and year fixed effects are controlled and robust standard errors are corrected for within-firm clustering. ***, ** and * indicate statistically significant at 1%, 5% and 10% level respectively.

VARIABLES	Small	Large	High leverage	Lower leverage	Low WW	High WW
Panel A						
Exposure to TARP (Dum)× Post dummy	**-0.010*** **	-0.003	**-0.009** **	-0.005	-0.005	**-0.008** **
	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)
Panel B						
Exposure to TARP (Amt)× Post dummy	**-0.009** **	-0.004	**-0.008** **	-0.006	-0.005	**-0.007***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Panel C						
Exposure to TARP (Num)× Post dummy	**-0.008** **	-0.003	**-0.006**	-0.006	-0.003	**-0.006**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)

Figure 1 Graphical Illustrations of Hypotheses

Graph below illustrates our hypothesis and the null hypothesis. The main hypothesis in our paper is that at the bank level, the negative effect associated with TARP participation is cancel out with the positive effect associated with TARP participation. However, at the client firm lever, TARP firm can't directly enjoy the benefit with the government funding, and furthermore they suffer from valuation loss as market confirm that their main bank is in poor financial condition. The null hypothesis is that TARP will benefit client firms of aided bank as it alleviate banks' incentive to hold capital and encourage them to resume lending.

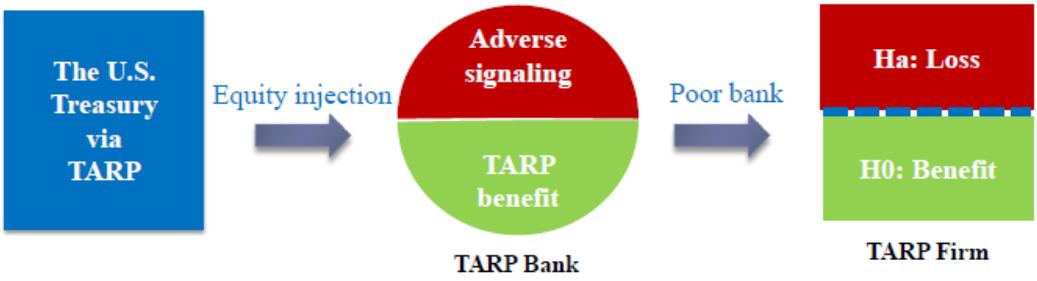


Figure 2 Sample Definition

Graph below shows our sample definition. TARP firms refer to firms whose main bank participated in TARP, whereas non-TARP firms are firms whose main bank didn't participated in TARP. Main bank is defined as the number 1 bank based on past 5 year lending relationship prior to TARP injection. Both TARP firms and non-TARP firms are restricted to the firms with transaction record in LPC (Dealscan) Database through the period from 2003 Oct to 2008 Oct.

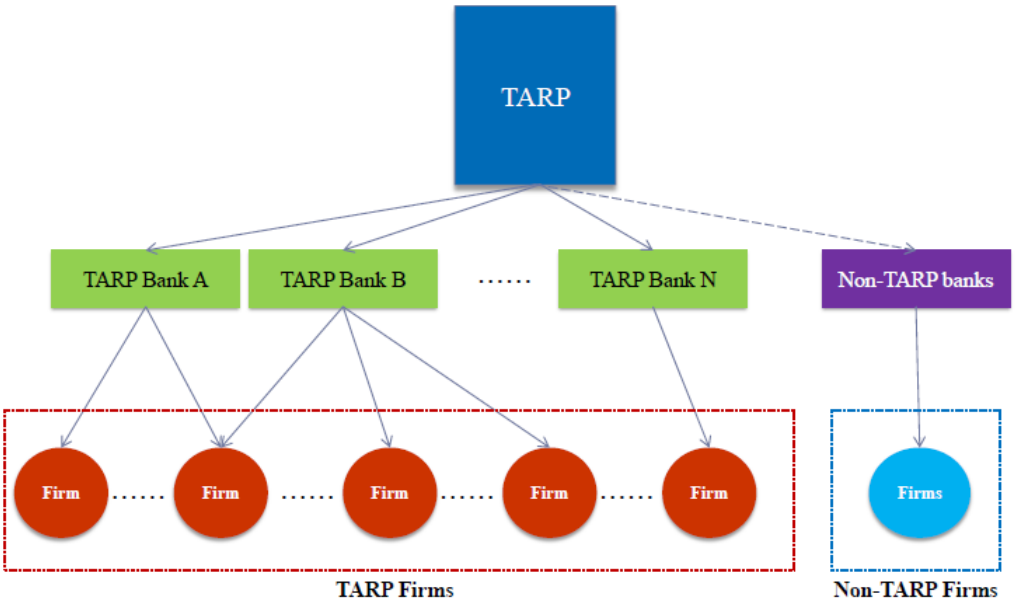
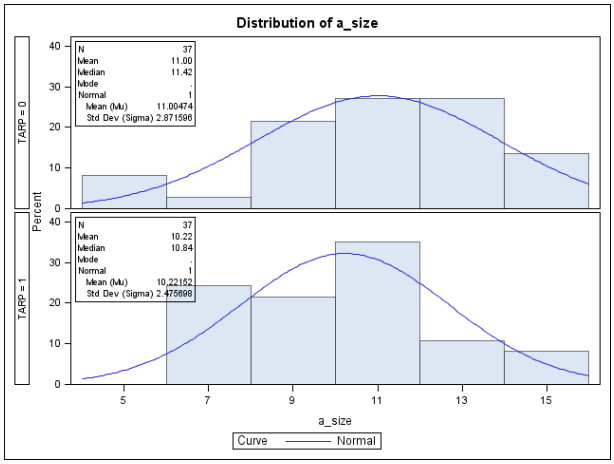


Figure 3 Distribution of Matched Bank Characteristics

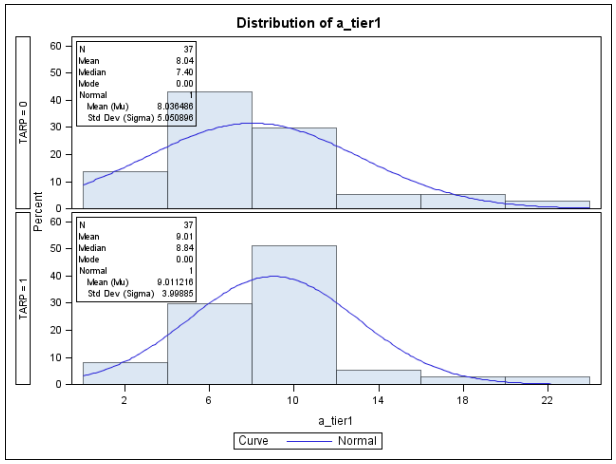
Below provide the distribution histogram of our matched banks. In specific, we obtained the control banks for sample TARP banks using propensity score matching. Propensity score matching is based on ex-ante (average of 2006 and 2007) bank size, tier 1 capital ratio, ROA and liquid asset. Both 1 to 1 matching and 1 to 5 matching are adopted.

<u>One-to-one matching</u>

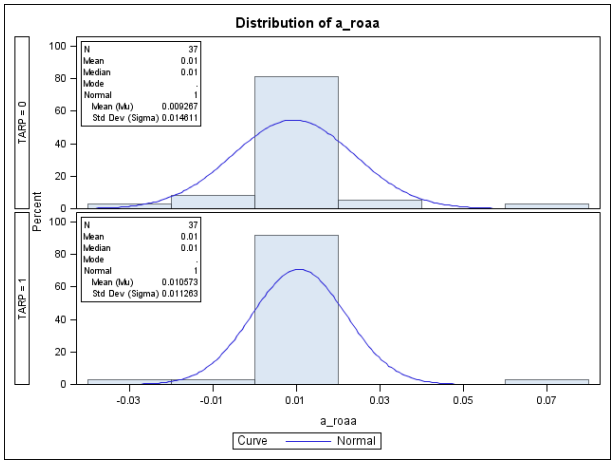
Bank Size



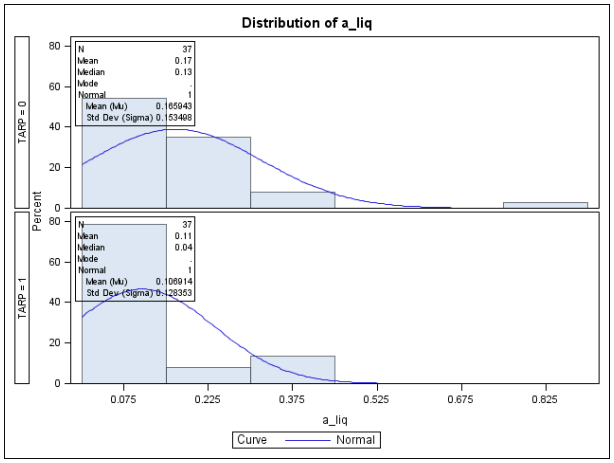
Bank Tier 1



Bank ROA

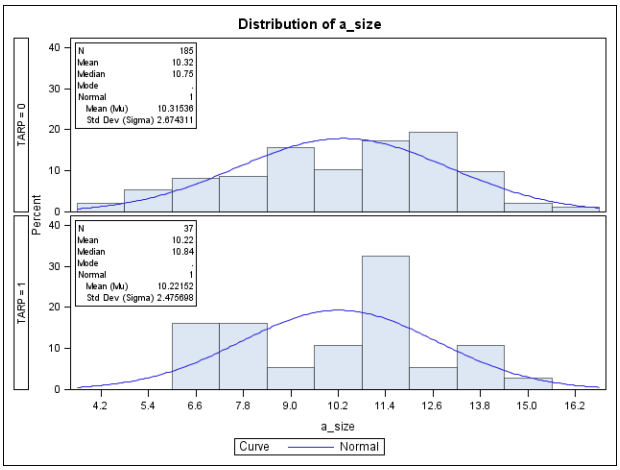


Bank Liquidity

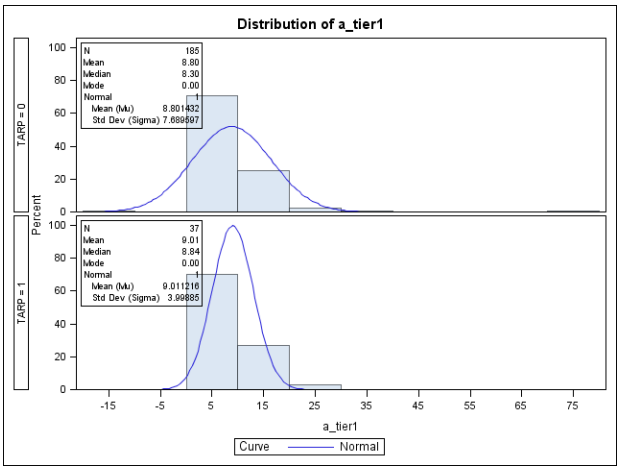


One-to-five matching

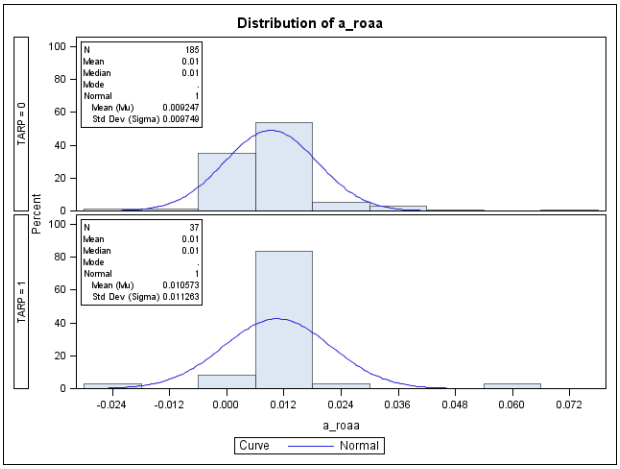
Bank Size



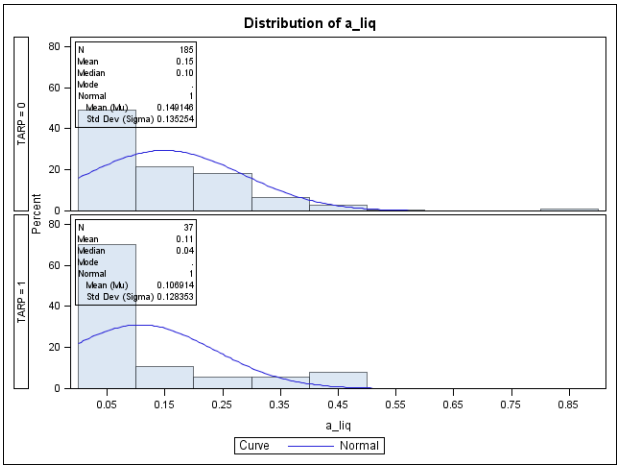
Bank Tier 1



Bank ROA



Bank Liquidity



Appendix 2 TARP bank lending Verse non-TARP bank lending in aggregate level

	Q4 2010		Median Percentage change from			Q4 2010		Median Percentage change from		
	$ millions (aggregate)	$ millions (median)	Q3 2008	from previous quarter	from previous year	$ millions (aggregate)	$ millions (median)	Q3 2008	from previous quarter	from previous year
	CPP Institutions with assets > $100 Billion (Number of Institutions = 13)					Non CPP Institutions with assets > $100 Billion (Number of institutions = 0)				
Asset	$7,657,191	$199,104	-8.15%	-0.41%	1.16%					
Total Loans	$3,941,692	$128,730	-9.48%	0.45%	1.05%					
Commercial and Industrial loans	$651,492	$25,070	-24.33%	1.61%	-0.99%					
	CPP Institutions with assets between $10 billion and $100 billion (Number of Institutions = 38)					Non CPP Institutions with assets between $10 billion and $100 billion (Number of Institutions = 29)				
Asset	$1,188,617	$18,232	-2.00%	-1.06%	-1.87%	$730,641	$18,048	9.57%	0.08%	2.39%
Total Loans	$691,661	$11,500	-11.87%	-0.49%	-4.20%	$420,081	$11,294	-5.99%	0.07%	1.42%
Commercial and Industrial loans	$157,840	$2,571	-15.61%	0.73%	-6.97%	$32,251	$600	-18.93%	-0.86%	-8.01%
	CPP Institutions with assets between $1 billion and $10 billion (Number of Institutions = 184)					Non CPP Institutions with assets between $1 billion and $10 billion (Number of Institutions = 344)				
Asset	$499,054	$2,032	0.59%	-1.23%	-2.83%	$850,019	$1,664	6.97%	-0.07%	1.54%
Total Loans	$339,559	$1,339	-8.91%	-2.02%	-6.29%	$521,945	$1,073	-1.16%	-0.92%	-1.54%
Commercial and Industrial loans	$52,747	$159	-17.65%	-2.03%	-7.92%	$67,621	$109	-7.92%	-0.35%	-4.68%
	CPP Institutions with assets < $1 billion (Number of institutions = 460)					Non CPP Institutions with assets < $1 billion (Number of Institutions = 5817)				
Asset	$168,277	$294	9.65%	-0.74%	0.27%	$1,170,120	$134	9.24%	0.33%	2.44%
Total Loans	$118,379	$206	1.23%	-1.65%	-3.12%	$758,010	$83	2.06%	-0.86%	-0.81%
Commercial and Industrial loans	$17,747	$26	-8.15%	-1.50%	-6.77%	$92,362	$8	-4.40%	-0.99%	-2.57%

Appendix 3 TARP bank lending Verse non-TARP bank: Performance in aggregate level

	Q4 2010		Median Percentage change from			Q4 2010		Median Percentage change from		
	Weighted Average	Median	Q3 2008	Previous quarter	Previous Year	Weighted Average	Median	Q3 2008	Previous quarter	Previous Year
	CPP Institutions with assets > $100 Billion (Number of Institutions = 13)					Non CPP Institutions with assets > $100 Billion (Number of institutions = 0)				
Tier 1 leverage ratio	8.08%	8.46%	7.14%	8.40%	8.19%					
Tier 1 Risk based capital ratio	11.51%	11.81%	8.89%	11.39%	10.98%					
Total risk based capital ratio	14.56%	14.98%	11.70%	14.75%	14.43%					
Return on equity	8.37%	7.66%	5.56%	7.88%	4.60%					
Return on Assets	0.91%	0.93%	0.74%	0.89%	0.49%					
Total Loans	5.79%	4.50%	2.37%	4.77%	4.92%					
Commercial and Industrial loans	2.68%	1.77%	0.88%	2.09%	2.90%					
Total Loans	0.76%	0.56%	0.44%	0.76%	0.73%					
Commercial and Industrial loans	0.44%	0.37%	0.20%	0.44%	0.51%					
	CPP Institutions with assets between $10 billion and $100 billion (Number of Institutions = 38)					Non CPP Institutions with assets between $10 billion and $100 billion (Number of Institutions = 29)				
Tier 1 leverage ratio	10.66%	9.08%	7.74%	8.92%	8.40%	9.61%	8.82%	7.66%	8.58%	8.38%
Tier 1 Risk based capital ratio	13.21%	12.54%	9.36%	12.18%	10.47%	16.62%	14.21%	10.91%	13.76%	12.23%
Total risk based capital ratio	16.17%	14.94%	11.40%	14.50%	13.01%	17.82%	15.02%	11.98%	15.19%	13.70%
Return on equity	4.62%	6.44%	2.00%	6.54%	-0.89%	9.21%	9.60%	5.50%	9.58%	7.03%
Return on Assets	0.55%	0.71%	0.19%	0.69%	-0.09%	1.00%	0.92%	0.49%	1.01%	0.75%
Total Loans	3.95%	2.88%	1.86%	3.14%	4.26%	4.01%	2.52%	1.06%	2.64%	2.36%
Commercial and	1.99%	1.73%	0.77%	1.91%	2.19%	1.48%	0.97%	0.31%	1.00%	0.98%

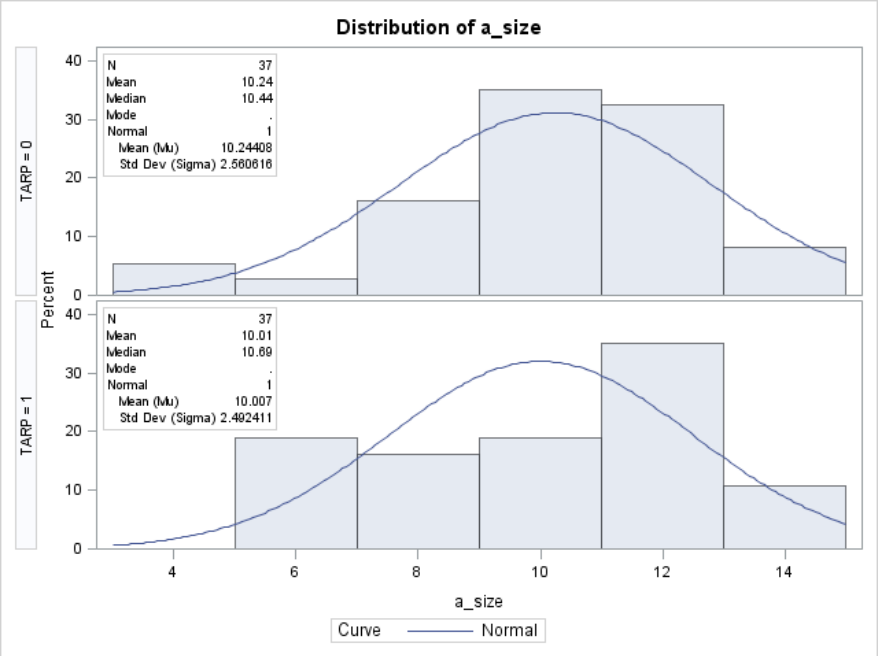
Industrial loans										
	CPP Institutions with assets between $1 billion and $10 billion (Number of Institutions = 184)					Non CPP Institutions with assets between $1 billion and $10 billion (Number of Institutions = 344)				
Tier 1 leverage ratio	8.94%	8.92%	8.21%	8.81%	8.54%	10.02%	9.04%	8.89%	9.06%	8.71%
Tier 1 Risk based capital ratio	12.64%	12.05%	9.87%	11.81%	11.15%	15.19%	13.12%	11.56%	12.93%	12.09%
Total risk based capital ratio	14.02%	13.47%	11.06%	13.14%	12.41%	16.41%	14.37%	12.69%	14.20%	13.24%
Return on equity	-3.01%	4.88%	4.67%	4.72%	0.04%	3.26%	6.57%	5.89%	7.19%	5.18%
Return on Assets	-0.31%	0.49%	0.47%	0.53%	0.00%	0.36%	0.71%	0.62%	0.77%	0.53%
Total Loans	4.83%	3.63%	1.74%	3.66%	3.54%	3.99%	2.31%	1.03%	2.40%	2.29%
Commercial and Industrial loans	2.55%	2.09%	0.93%	1.89%	2.06%	2.47%	1.38%	0.57%	1.41%	1.21%
	CPP Institutions with assets < $1 billion (Number of institutions = 460)					Non CPP Institutions with assets < $1 billion (Number of Institutions = 5817)				
Tier 1 leverage ratio	9.03%	9.00%	8.84%	9.02%	9.03%	9.88%	9.56%	10.09%	9.68%	9.57%
Tier 1 Risk based capital ratio	12.35%	12.23%	10.78%	12.20%	11.79%	14.69%	14.48%	14.35%	14.38%	13.90%
Total risk based capital ratio	13.65%	13.56%	12.00%	13.51%	13.04%	15.88%	15.64%	15.38%	15.53%	15.04%
Return on equity	-6.96%	1.81%	3.26%	3.65%	-0.22%	0.07%	5.16%	6.98%	6.63%	3.90%
Return on Assets	-0.68%	0.19%	0.33%	0.35%	-0.02%	0.01%	0.56%	0.76%	0.73%	0.42%
Total Loans	4.06%	3.01%	1.14%	3.05%	2.52%	3.35%	1.65%	0.96%	1.69%	1.60%
Commercial and Industrial loans	2.83%	1.38%	0.39%	1.26%	1.09%	2.34%	0.49%	0.23%	0.56%	0.55%

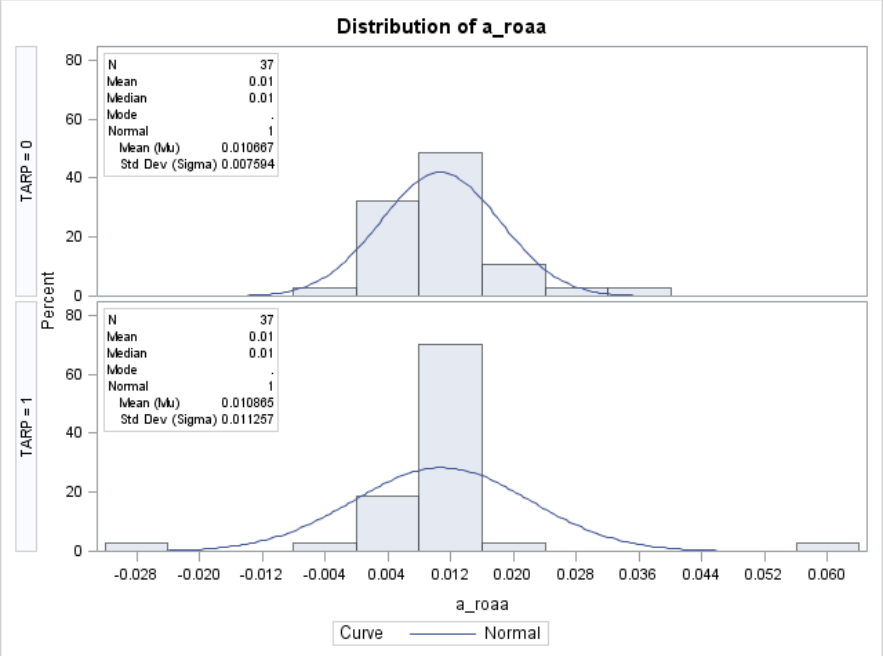
Appendix 4 TARP Fund Repayment

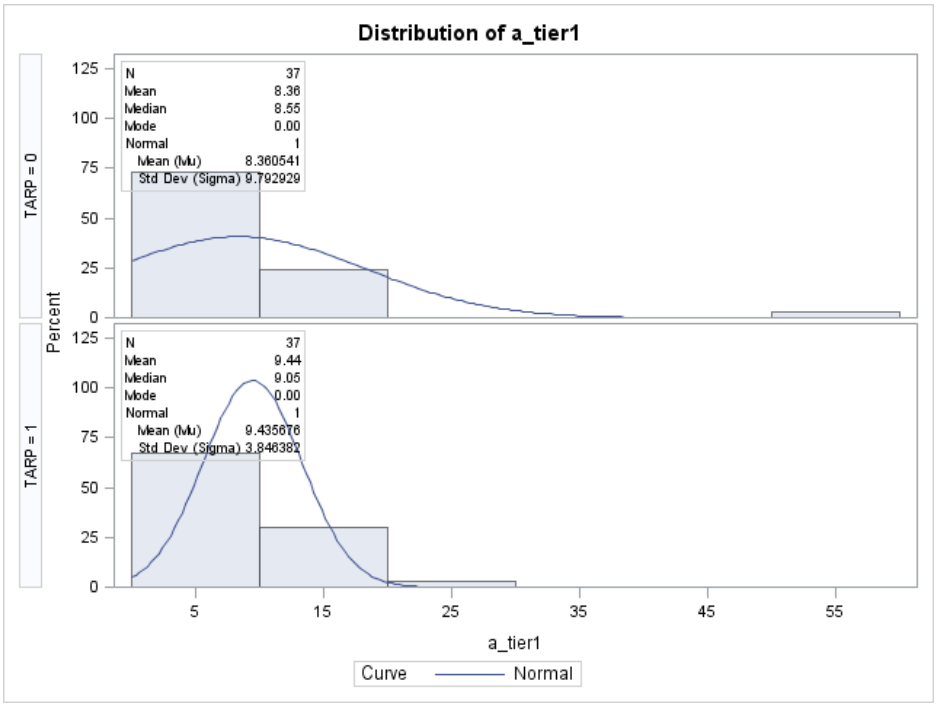
	Repayment	
Bank Name (parent level)	Announcement date	Effective date
JP Morgan Chase	2009.02.23	2009.06.17
PNC Financial Services	2009.03.02	2010.02.10
Wells Fargo	2009.03.06	2009.12.23
Capital One Financial Corp	2009.03.09	2009.06.17
Northern Trust Co	2009.03.11	2009.06.17
City National Corporation	2009.03.11	2009.12.30
Comerica	2009.03.11	2010.03.17
Morgan Stanley	2009.03.11	2009.06.17
The Bank of New York Mellon	2009.03.11	2009.06.17
Bank of America	2009.03.18	2009.12.09
Goldman Sachs	2009.03.24	2009.06.17
BB&T Corp	2009.04.17	2009.06.17
F.N.B. Corporation	2009.06.09	2009.09.09
CITIGROUP	2009.12.14	2010.12.10
Webster Financial Corporation	2010.03.01	2010.03.03
Huntington Bancshares	2010.12.16	2010.12.22
1st Source Bank	2010.12.24	2010.12.29
Fifth Third Bancorp	2011.01.20	2011.02.02
Associated Banc-Corp	2011.01.21	2011.04.06
Peoples Bank	2011.01.25	2011.02.02
Bridge Capital Holdings	2011.02.14	2011.02.23
SunTrust Bank	2011.03.18	2011.03.30
KeyCorp	2011.03.19	2011.03.30
M&T Bank Corp	2011.04.27	2011.05.18
Regions Financial Corp	2012.02.16	2012.04.04

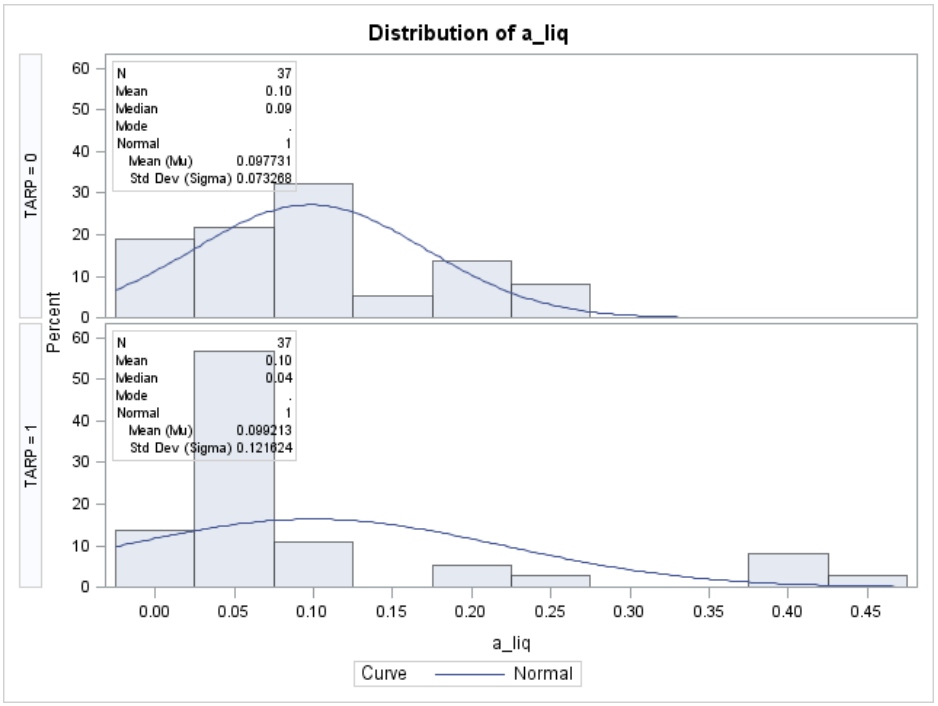
Appendix 5 Alternative Propensity Score Matching Method

In the first step of propensity score matching, the control covariates are bank size, capital adequacy, missing in capital adequacy (Tier1 ratio), loan to asset ratio, ROA, liquid asset ratio, nonperforming loan ratio, leverage and deposit to asset ratio. Comparing to our main method, this approach includes more covariates suggested by Duchin and Soyura (2012). However, the increase in the number of covariates in the first step leads to a drawback that key characteristics such as tier one capital ratio, liquid asset and ROA are not balanced between treatment and control banks even in one-to-one matching procedure. This is partially caused by the limited samples in the regression (38 TARP banks and 304 non-TARP banks in the full sample). Nevertheless, using this = method, we still have consistent evidence.






Distribution of a_tier1
TARP = 0
N 37
Mean 8.36
Median 8.55
Mode 0.00
Normal 1
Mean (Mu) 8.360541
Std Dev (Sigma) 9.792929
TARP = 1
N 37
Mean 9.44
Median 9.05
Mode 0.00
Normal 1
Mean (Mu) 9.435676
Std Dev (Sigma) 3.846382
Percent
a_tier1
Curve Normal


Distribution of a_liq
TARP = 0
N 37
Mean 0.10
Median 0.09
Mode .
Normal 1
Mean (Mu) 0.097731
Std Dev (Sigma) 0.073268
TARP = 1
N 37
Mean 0.10
Median 0.04
Mode .
Normal 1
Mean (Mu) 0.099213
Std Dev (Sigma) 0.121624
Percent
a_liq
Curve Normal

Panel A Propensity score matching (1:1 matching)

	CAR(-1,+1)				
	(1)	(2)	(3)	(4)	(5)
Exposure to TARP (Dum)	-0.012**	-0.013**			
	(0.005)	(0.005)			
Exposure to TARP (Amt)			-0.013**		
			(0.005)		
Exposure to TARP (Num)				-0.012**	
				(0.005)	
Exposure to TARP (Dum)× Round 1					-0.011**
					(0.005)
Exposure to TARP (Dum)× Round 2					-0.020***
					(0.006)
Exposure to TARP (Dum)× Round 3					0.040
					(0.045)
Other controls	No	Yes	Yes	Yes	Yes
Observations	5362	5145	5145	5145	5145

Panel B Propensity score matching (1:5 matching)

	CAR(-1,+1)				
	(1)	(2)	(3)	(4)	(5)
Exposure to TARP (Dum)	-0.013***	-0.014***			
	(0.004)	(0.004)			
Exposure to TARP (Amt)			-0.016***		
			(0.005)		
Exposure to TARP (Num)				-0.016***	
				(0.005)	
Exposure to TARP (Dum)× Round 1					-0.013***
					(0.004)
Exposure to TARP (Dum)× Round 2					-0.023***
					(0.006)
Exposure to TARP (Dum)× Round 3					0.029
					(0.039)
Other controls	No	Yes	Yes	Yes	Yes
Obs.	10452	10024	10024	10024	10024