

# **Loan Partnerships with Intervention of Regulatory Bailouts: Evidence of TARP effect on Syndicated Loan Structure**

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## **Abstract**

In this paper we investigate the bailout effect on syndicated loan structure by investigating the TARP and Non-Tarp Loans. Some of the recent papers investigating the effect of TARP in terms of performance and efficiency show mixed results. To the best of our knowledge this is the first paper which investigates the bailout effect by looking at syndicated loan structure. We find that while TARP has provided low cost funding during the crisis, it has effectively prevented moral hazard behaviors of its participants as evidenced by more diversified syndicated loan structure of TARP loans. Furthermore our findings show that diversification of syndicated loan is strengthened for above median loan size group and loans whose lender banks have above median asset size and above median tier 1 capital ratio.

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## **Loan Partnerships with Intervention of Regulatory Bailouts: Evidence of TARP effect on Syndicated Loan Structure**

### **Introduction:**

Loan syndication happens when multiple lenders issue a loan to a single borrower under the same contract. Loan syndication is common practice and used frequently for corporate restructuring purposes such as mergers and acquisition, corporate takeovers, corporate expansion, exit financing and even meeting working capital needs of large companies requiring large amount of funding. Lenders form syndication for different reasons and incentives. Mostly because of large size of the loan they partner with others in order to limit their risk exposures and diversify their asset portfolio. Incentives for forming syndicate can be explained according to resource-based and organizational learning perspective in international partner selection theory (Hitt, Dacin, Levitas, Edhec, & Borza, 2000). Syndicated loan market for funds have grown multifold in recent years due to expanding corporate activities and better access to global funding market. Shared National Credit Program under Federal Reserve System defines loan over \$20 million and shared by more than three supervised institutions as large syndicated loan which requires periodic review by the Reserve Banks. As of 2013 syndicated loan outstanding balance stands at \$1.36 trillion (45 percent of total commitment of \$3.01 trillion ) against \$245 billion (35% of total commitment of \$692 billion) in 1989 (Board of Governors of the Federal Reserve System, 2013).

Syndicated loan process starts with a borrower requesting a loan from its preferred bank which generally plays a lead bank role. The lead bank is responsible for due diligence, risk evaluation and arranging funds by inviting other lenders to meet borrowers' debt needs and

channeling interest and principal repayments to syndicate participants when payments are made. Lead arrangers can be commercial banks, large bank holding companies or financial holding companies that partially fund the loan themselves and allocate remaining portions to participants. Investment banks can play the role of lead arrangers as well as intermediary by matching borrowers with potential investors while charging fees for the intermediary services. Due to complexities and various incentives involved in syndicated loan process different types of institutions actively participate in U.S. syndicated loan market. Out of total syndicated loan commitments U.S. banks constitute 44.4%, foreign banks constitute 35.8% and non-banks constitute 19.7% respectively as of 2013 (Board of Governors of the Federal Reserve System, 2013). Non-bank institutions include institutional investors such as securitization pools, hedge funds and insurance funds.

Relationship between lead and participant lenders as well as syndicate loan structure is explained by agency theory. Responsibilities, risk and benefit sharing among lenders should be aligned to prevent any moral hazard issue. Previous studies highlight potential moral hazard issue of lead arrangers due to higher monitoring costs, more responsibilities and free-riders' incentives among participants in the syndicated loans (Anil & Wei-Ling, 2011; Sufi, 2007). Sufi (2007) argues that lead lenders reduce free-riding incentive of participants by retaining larger share in the syndicated loan consistent with its monitoring and other responsibilities. Moreover he finds that proximity of participants with the borrower in terms of geography and previous relationships define partner selections.

Anil and Wei-Ling (2011) find that as number of participants increases, lead lenders weaken screening of borrowers and such behaviors are more pronounced during the growth cycle. During recessionary cycle syndicate structure becomes more concentrated in terms of the

number of participants as the recessionary period provides incentive to reduce monitoring costs of the lead arrangers. However, with government bailout intervention it is crucial to see the effect since such external factor may work as a different incentive mechanism causing significantly different behaviors. Mariassunta and Luc (2012) find that during downturns of local market foreign participants reduce their shares in the syndicate loans and prefer to invest in their home markets. Defined as flight-home effect this may significantly reduce capital supply, increase liquidity needs and borrowing costs. Government bail-outs with purpose of stabilizing economy during hard times aim to meet these liquidity needs and increase flow of funds by injecting low cost capital to the financial system. However, in absence of strict rules and requirements government bail-outs may increase lenders' risk appetite. As a result of increased risk appetite lead lenders may either shirk their role of monitoring or form less diversified syndicate structure during economic downturns.

During the economic downturn in 2008, US Congress enacted Emergency Economic Stabilization Act that facilitated massive bail-outs up to \$700 billion through its Troubled Asset Relief Program (TARP). The purpose of TARP was to stimulate lending and restore credit flow in the economy. Capital Purchase Program (CPP) under TARP was to rescue banks by injecting necessary capitals during hard times.

The purpose of this paper is to empirically examine the impact of regulatory intervention on syndicated loan partnerships during the recent subprime mortgage crisis of 2008. We believe that this study will enrich the existing loan syndication literature by examining the exogenous regulatory role of TARP and its effect on syndicated loan structure. Our findings show a positive and significant effect of TARP on number of banks meaning if we have TARP recipient in the syndicate, syndicated structure becomes more diversified. Furthermore we find negative

association between TARP and number of leads, Bankshare and HHI. Our results remain valid after the robustness checks and additional analysis.

Our paper is organized as follows: Section I discusses the existing literature ; Section II describes the data and variables used in this study; Section III describes methodology and hypothesis development ; Section IV provides diagnostic test results ; Section V provides results and discussion; Section VI provides robustness checks and Section VII concludes.

## **I. Literature review**

Treasury report on TARP performance (Treasury, 2013) indicates that the initial commitment of \$700 billion was never implemented in practice and actual amount was reduced to approximately \$475 billion through its 5 different programs. Among these programs, \$250 billion was authorized to CPP which was later reduced to \$205 billion. As of March, 2013 under CPP total of \$204.9 billion has been injected to bank capital out of which \$194.8 billion has been paid back with \$3.3 billion loss and active outstanding of \$6.8 billion (Treasury, 2013). According to Treasury report initial injection of \$204.9 billion is fully recovered and by February 13, 2013 Treasury received \$221 billion in the form of repayment, dividend, interest and other income. Total of 707 financial institutions actually participated in the program while number of applications to the TARP program was well above it. Some evidences suggest that banks considered TARP as an option for less costly funding possibility (Cornett, Li, & Tehranian, 2013).

Several studies have explored the impact and efficiency of TARP in recent years. Gaby and Walker (2011) conclude that overall TARP has been effective in restoring confidence in the U.S. financial system. Further long term stock performance of TARP firms outperformed their

non-TARP counterparts (Hollowell, 2011) . Stock market volatility and investors fear decreased due to TARP bailouts by regaining investor confidence in the market (Huerta, Perez-Liston, & Jackson, 2011; Yildirim & Pai, 2012). In contrast to that Harris, Huerta, and Ngo (2013) based on their non-parametric analysis find evidences of deteriorated operating efficiency for TARP firms due to moral hazard problem.

One of the reasons behind the recent crisis has been the excessive risk taking behavior of the banks and institutional investors. TARP attempted to limit risk exposures and put restrictions on executive compensation for banks seeking TARP money. Bayazitova and Shivdasani (2012) and Cadman, Carter, and Lynch (2012) find that such restrictions for the executive compensation made firms less likely to participate in Capital Purchase Program (CPP). Phillips (2010) studies the relationship between performance and compensation for TARP firms. Kim & Stock (2012) findings suggest that TARP affects executive compensation, firm performance, capital structure of banking firms at micro level and stock market stability and financial system at macro level. Moreover, Taliaferro (2009) argue that because CPP is capital injection, it facilitated banks to issue new loans while meeting capital ratio requirement. Black and Hazelwood (2012) examine consequences of TARP by highlighting impact of executive compensation conditions to restrict risk-taking behaviors. They find that risk-taking behavior is highly related to bank size. While larger banks increase their risk taking consistent with the credit stimulation, smaller banks reduce their risk taking as a result of executive compensation restriction.

## **II. Data and variables**

### *Sample construction:*

Our sample for this study comes from four different databases. First we collect loan level data from Thomson Reuter's Dealscan database. Then we collect TARP information from Capital Purchasing Program (CPP) report from Treasury website. We manually match both lenders from Dealscan and TARP participants from CPP report with bank information from Bank Regulatory call reports from Wharton WRDS by lender name and location because both loan and TARP data report banks by their name and location only. While bank institutions participate in TARP under their bank holding company name, they may issue loans through their commercial banking subsidiaries. Relatively healthy large banks may channel bail-out funding to their lending subsidiaries in order to provide liquidity to borrowers and facilitate flow of fund in the economy. Providing sufficient credit flow in the economy has been one of the main purposes of the CPP.

We treat parent holding company as our main lender level in the syndicated loans and use parent company information as our lender characteristics. We believe such treatment is acceptable given large amount of syndicated deals. Moreover, because financial statements are consolidated at bank holding company level our approach prevents double counting, and overestimation bias. Furthermore participating in the syndicated loans as separate agents either via its parent or subsidiaries will not reduce overall risk exposure at holding company level. Therefore we believe using consolidated financial statements at bank holding company level is the most proper measure for our analysis. In addition to that, under TARP it aggregates overall risk exposure and specifies conditions for significant subsidiaries of TARP participants to satisfy.

We determine a parent institution by first regulatory high holder identification code (rssdhcr) as specified in Bank regulatory database in a given quarter. In case of missing first regulatory high holder variable, we treat the bank to be a parent of itself. We further merge our loan, bank, TARP combined data with borrower's information using Dealscan-Compustat link provided by Chava and Roberts (Chava & Roberts, 2008). Our baseline analysis is conducted at package level with at least one bank. We further reduce our sample to packages with at least one lead bank and call this sample as "lead bank only packages" and conducted analysis at unique lender-package pair for robustness check.

Dealscan reports loans at both package and facility levels where each deal is signed at package level that is potentially separated into several facilities. Facility may differ in amounts, start dates, end dates, security, renewals and distribution methods although they belong to the same package. Such variations of terms are set to meet borrower specific needs, project implementation stages, and deal purposes. However, this does not imply each facility terms would be different from another rather some could share common characteristics as specified in loan contract. Therefore, we observe loan terms both at package and facility levels from Dealscan. For instance, deal currency, collateral, spread, debt covenants may be the same for each facility of a package, thus determined at package level. By the same token, if the same lenders participate in each facility under same terms, lender characteristics will be the same and can be easily converted to package level. We conduct our analysis at package level and convert certain facility level variables to package level where necessary. Details of each variable construction are provided in the appendix.

Our initial dataset is composed of 652,281 facility-lender observations from first quarter of 2004 to last quarter of 2011. These observations consist of 116,230 unique facilities that make



76,874 unique packages involving 1,031 banking institutions and 946 parent bank institutions. First we drop observations with no borrower identification based on Dealscan-Compustat link provided by Chava and Roberts (2008) which brings number of observations down to 313,767 observations with 46,917 unique facilities belonging to 34,131 unique packages. In these 34,131 packages 684 unique parent bank institutions involved through 754 unique bank subsidiaries. We further drop non-bank lenders from our observations since we cannot observe lender characteristics for these institutions. We believe the above treatment is reasonable provided that Dealscan reports every participant of a syndicated loan as lenders even if it does not fund the loan, but provide particular service related to the complex syndicated loan process. Non-lending services providers may include legal agencies, insurance companies, brokers and investment banks.

Bank regulatory database we use for lender's information provide consolidated financial statements for bank holding companies as well as individual commercial banks. We obtain parent bank financial information from Bank Regulatory database using first regulatory high holder identification code and downloaded financial information for parent only. If there is no first regulatory high holder identified we use bank's own financial information as its parent's information. We believe above process will prevent estimation biases in cases where a bank holding company participated in syndicated loan through several subsidiaries or through both parent and subsidiary. When non-bank institutions are dropped from our data, the total number of observations reduces to 76,420. Total number of bank lenders and parent bank institutions remain the same as before respectively at 754 and 684. This is consistent with our previous counting where we count only banking institutions by their unique rssid code.

We further drop observations with missing values for bank allocation in the syndicated loan which is one of our dependent variables to measure the syndicate loan structure. Our process is consistent with previous literature (Anil & Wei-Ling, 2011; Chu, Zhang, & Zhao, 2014; Mariassunta & Luc, 2012; Sufi, 2007). Before dropping these observations, we replace bank allocation by 100 percent for loans with a sole lender counting both bank and non-bank institutions following Chu et al. (2014). After this step sample size reduces to 64,212 with 17,952 facilities and 12,921 packages representing 747 bank institutions and 678 parent bank institutions.

Next, we further drop non-US loans and missing values for bank, borrower and loan characteristics which results in significant drop. The total number of observations drops to 25,257 from previous 64,212. To convert initial facility-bank level data of 25,257 observations we drop duplicate values and end up with unique 16,472 package-parent pairs<sup>‡</sup>. Henceforth, we use word “bank” to refer parent bank which is our level of analysis. Our final sample is composed of 6,290 unique packages with at least one bank and decreases to 1,753 packages if we exclude non-banking lead packages. While our baseline sample of 6,290 includes 589 TARP-loans, lead-bank only 1,753 packages involve 134 TARP-loans. Due to significant drop of 78% on TARP loans, the latter sample may be subject to representation bias<sup>§</sup>. Therefore, we conduct our analysis at all packages to include bank and non-bank lead loans. Moreover, in our robustness check, we conduct lender level analysis to study impact of TARP while controlling for lender roles. If there is more than one bank for a syndicated loan we take the average of bank characteristics to define lender characteristics at package level. Such conversion is consistent with prior literature (Sufi, 2007). We define each variable as follows.

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<sup>‡</sup> We conduct lender level analysis as a robustness check on this sample.

<sup>§</sup> Please refer to summary statistics table to compare two samples

### ***Bank loan syndicate structure***

Variables for syndicate structure includes number of total banks, number of lead banks in the syndicate and average bank share in the syndicate as well as syndicate concentration measured by Herfindahl index (HHI) and is consistent with prior literature (Anil & Wei-Ling, 2011; Mariassunta & Luc, 2012; Sufi, 2007). We interpret larger number of total banks, number of lead banks and lower average lead bank share and overall HHI to determine less concentrated syndicate structure. In order to control for supply factors of syndicated loan market we include lender characteristics in the analysis which was absent in the literature. However, with the new variables' introduction, we had to restrict lenders to bank institutions only. Dealscan includes every participant in the syndicate and does not distinguish banks from non-banks. Therefore, we identify lenders as banking entities by their unique Federal Reserve System identification number, *fed\_rssd*. Because of such treatment, lower number of banks in our analysis compared to number of lenders in other studies is expected. We believe it is important to control for lender characteristics when explaining TARP impact in the syndicate loan structure. It will avoid potential omitted variable bias as Berger and Roman (2013) find significant differences between TARP and non-TARP bank characteristics.

### ***Major explanatory variables***

In order to test our hypotheses we construct a dummy variable for TARP recipient. The dummy variable takes a value of 1 if the bank in the syndicate had received TARP funding at the time of deal activation. We treat TARP effects to be temporary and consider TARP recipients as non-TARP as soon as they withdraw from the program. It is consistent to explain evidences of certain banks to repay TARP capital sooner (Bayazitova and Shivdasani, 2012 and Cadman et

al., 2012). Next, we convert TARP-bank dummy to TARP-loan dummy if at least a bank in the syndicate is a TARP recipient regardless of its role. We do not limit our sample to banks with lead arranger roles, because at first most of the TARP recipients are non-lead banks which are highly subject to representation bias. Second, we argue that regardless of its role, a bank shall contribute larger share to the syndicate with TARP funding *ceteris paribus*<sup>\*\*</sup>. Moreover, we believe such conduct is crucial for assessing overall, both direct and indirect, impact of TARP on the syndicated loan structure. TARP recipients who play lead arranger role may directly determine the syndicate structure since they decide whom to invite for bids and whom to partner with. Similarly, TARP-recipients those who engage as participants may indirectly affect the syndicate structure by contributing larger/lower shares that terminate/trigger new entrants.

Moreover, we measure a degree of TARP funding as a ratio of TARP amount over bank regulatory capital and call this variable as a “TARP-infusion rate”. At package/loan level we take average of TARP-infusion rates if there are more than one TARP recipients in the loan. TARP infusion rate takes value of zero for non-TARP recipients and for TARP recipients if the loan is issued outside of TARP period. We use different proxies for TARP-infusion rate defined as TARP amount over Tier 1 capital, TARP amount over total regulatory capital, TARP amount over risk weighted asset and TARP amount over total equity and name them as TARP infusion 1, 2, 3 and 4 respectively following prior literature (Berger & Roman, 2013; Chu et al., 2014). For briefness we only report results for TARP infusion rate 3 since all measures demonstrate similar results.

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<sup>\*\*</sup> In our robustness check at unique lender-package pairs’ analysis, we control for bank role. Please see for further details.

### ***Control variables***

We control for loan, borrower and bank characteristics as described below. These variables are consistent with the choice of variables used in prior literature (Berger & Roman, 2013; Chu et al., 2014; Lin, Ma, Malatesta, & Xuan, 2012). Detailed definition of each variable is provided in the appendix part.

### ***Loan characteristics***

We control for loan size as measured by natural logarithm of loan amount in millions of US dollar. Large loans expose bigger risks in case of borrower default, thus lead arrangers have more incentive to share the risk. Therefore, ceteris paribus we believe for larger loans syndicate structure will be less concentrated with higher number of bank participation, higher lead banks, smaller lead bank share and smaller Herfindahl index.

Moreover, we include loan maturity in our analysis and take natural logarithm of loan maturity measured in days. Loan maturity is determined by number of days between earliest facility start date to latest facility end date at loan/package level. Long term conveys higher chance of variability, thus implies higher risk. With the same token, as risk level increases lead arrangers have an incentive to form less concentrated syndicate structure in order to diversify and alleviate risks.

We control for loan security as well. Because loan security is given at facility levels we convert to package level if at least one of the facilities in the package is secured. Because secured loan warrants payback, it reduces loan risk significantly. As a result, lead banks are not as aggressive as to reduce risks and may prefer to retain larger share of the loan for themselves.

Therefore, everything else constant we believe for secured loans there will form more concentrated syndicate structure.

In addition to that we control for refinancing. Borrowers refinance for the purpose of seeking more favorable terms in general. A new refinanced loan may benefit borrowers better in terms of lower costs, longer maturity, lesser covenants and more relaxed conditions. Therefore, it may increase risk exposure for lenders. Because of that we believe with loan refinancing lead banks form more diversified loan structure by inviting more participants, and reducing the loan exposure for an individual lender. Both loan purpose and refinancing dummies are given at package level initially, thus require no conversion.

Last we control the loan purpose. According to Dealscan, lenders cooperate in lending for various reasons that include M&A, LBOs, takeover, recapitalization, debt repayment and working capital. Treatment of each purpose may vary depending on the risk exposure it conveys, thus we believe inclusion of the variable is necessary.

#### *Borrower characteristics*

We take lagged values of the borrower characteristics in consistent with Chu et.al (2014). Lenders conduct serious due diligence and borrower risk evaluation in advance to alleviate asymmetric information, thus potential moral hazard problem. Such procedure facilitates them to approve the loan, agree on loan terms and most importantly it is a significant factor to decide whether to actually participate in the loan. Although lenders try their best to capture loan prospects and future cash flows, all the estimation is largely relied on pre-loan conditions. We capture existence of S&P long term credit rating in our analysis since it is one of the very first criteria for borrower riskiness.

Also we control for borrower Tobin's Q, a measure of company growth. High growth firms whose market value of assets relative to book value is big, signals potential and market demands. Therefore, the capability of successfully implementing a loan project for a high Tobin's Q firm is high, thus warrants more concentrated loan structure. With the same token, a degree of R&D expense, indicates growth potential, thus shall have a positive impact on concentrated loan structure. As for firm cash holding, it conveys less liquidity risk, yet at the same time larger amount may signal inefficient resource use depending on the borrower industry. Therefore, we believe it is crucial to control cash holding.

Borrower leverage measured by a ratio of debt to total assets, signals a degree of indebtedness of a firm. Therefore, a higher value would signal more risk and suggests more diversified loan syndicate. In contrast to that, high profit firms have better capabilities to repay and imply less risks, thus suggests an incentive to retain higher share and more concentrated syndicate. Moreover, bigger firms in terms of their asset size are exposed to larger risks. From a lender's perspective, it alone may or may not be able to meet loan demands for larger firms. Even a bank has resources to meet loan demand alone, it is exposed to higher risk, thus has a higher incentive to diversify and share the risks. Therefore, we believe for larger borrowers, lead banks would form less concentrated syndicate structure.

As for tangibility, a ratio of borrower's tangible asset to total assets, it measures amount of explicit assets of a borrower and signals collateral potential. Therefore, with higher tangibility lead arrangers shall retain larger share and form more concentrated syndicate structure. Finally, we control for borrower cash flow volatility which indicates liquidity risk. As borrower cash flow becomes more volatile, uncertainty increases and there shall be more incentive to cooperate

among loan partners. We believe, in this case partners will form more diversified syndicate structure.

#### *Bank/lender characteristics*

We believe lending bank characteristics matter in the syndicate structure and highly correlated with TARP application and approval decisions. Omitting these variables would cause potential endogeneity bias, so we control for various characteristics. As in the borrower case, we take lagged values of the variables, because lenders evaluate each other before deciding to partner.

We measure the lender size by assets in millions of USD. Big banks with large amount of assets have capacity to issue bigger loans, thus do not require another bank to form syndicate ceteris paribus. Therefore, lender size shall have positive impact on syndicate concentration. Moreover, we control for Tier 1 capital ratio of banks as it is a supervisory requirement particularly for banks. We argue that high capital banks are more capable of issuing loan without relying on costly outside funding. Thus, with the same token, high capital lead arrangers shall form more concentrated syndicate structures everything else being constant.

We control for risk-weighted asset share following Chu et.al (2014). Risk-weighted asset is a proper measure of overall asset exposure weighted by their respective risk levels. It is relevant for not only assessing risky asset amount, but also looks at composition of asset portfolio. The higher portion of high risk assets in the total asset, the more willingness a bank shall have for diversification. Moreover, we consider lender deposit scaled by the bank total asset. Higher deposit outstanding indicates resource capacity, thus, signal less incentive to collaborate with others ceteris paribus. Cash holding is an another measure for liquid asset



resource and banks with large amount of cash have more potential to issue a loan alone, so have less incentive to form diversified syndicate structure.

To control for bank profitability, we add ROA and loan loss rate of banks in the regressions. The two imply opposite interpretation. While higher ROA indicates higher profitability, higher loan loss rate indicates lower profitability. We argue that high profit banks have more potential to issue loan by itself, thus signal less incentive of lead banks to cooperate with others. Participant banks with higher profitability signal greater capacity to absorb bigger share in the loan. Therefore, regardless of lender role highly profitable partners shall obtain larger share from the loan and form more concentrated loan syndicate.

Liquidity is another measure that conveys information about the lender's risk level, and the capacity to bear additional risks. Higher liquid assets relative to total assets a bank has it is less prone to liquidity risk. In contrast to that highly leveraged banks convey more riskiness, thus introduce higher incentive to partner with others in order to diversify.

In addition to these, we include several relationship and experience variables of banks in our analysis following Lin et.al (2012). The previous relationship between the borrower and a bank is measured by the number of deals, and the volume of USD deal amount within past five years relative to total number and volume of deals that borrower had with all the lenders. The stronger the previous relationship, it is more likely to issue loans to the borrower due to less information asymmetry as compared to a new borrower.

As for the bank experience, we measure by its industry expertise and the dominance in the syndicate loan market. Particularly we evaluate the number of previous deals and the actual dollar amount of deals of the bank in the borrower industry within previous five years. We create

a top ten bank dummy if a bank is one of the top ten lenders in the syndicated loan market in terms of both the number and the amount of deals. In the regression results we report relationship and experience variables as measured by deal amounts due to high collinearity between the number and the amount of deals. When we convert these variables to package level we take both the average and the sum. In our results part we report lead bank's total previous borrower relationship and syndicate loan experiences. We drop subordinate debt share, liability share and loan charge off due to high collinearity. All lead bank variables are averaged at package/loan level in our baseline analysis. We also include average of participant bank variables for non-bank lead loans in our robustness tests.

### III. Methodology and hypothesis development:

We use regression analysis to study effect of TARP on syndicated loan structure for our package level baseline analysis. The dependent variable is a measure of syndicated loan structure proxied by number of banks, number of leads, average bank share and syndicated loan Herfindahl index. The key independent variable is a TARP-variable and we control for lender bank, borrower and loan characteristics.

Our empirical model is constructed as follow:

$$\begin{aligned}
 & \text{Syndicate structure variable}_{i,t} = \\
 & \beta_0 + \beta_1 \text{TARP variable}_{i,t} + \gamma * \text{Mean lender characteristics}_{i,t-1} + \delta * \text{Loan characteristics}_{i,t} + \theta * \\
 & \text{Borrower characteristics}_{i,t-1} + \varphi * d\text{Quarter}_t + \varepsilon_{i,t}
 \end{aligned} \tag{1}$$

*TARP variable*  $_{i,t}$  is either a dummy variable or different measures of TARP infusion rates. Dummy variable for TARP loans takes a value of 1 for TARP loans and 0 for non-TARP

loans. TARP recipient dummy that is used to derive TARP loan dummy takes a value of 1 if its participating loan is originated between its initial TARP investment date and disposition date. Such treatment implies temporary effect of TARP on bank behaviors to rationale its incentive to get out of TARP. Bayazitova and Shivdasani (2012) and Cadman et al. (2012) argue as TARP requires its participants to meet restrictions on executive compensations, low cost capital may no longer be an attraction. Moreover, mean TARP infusion rate is an average of TARP infusion rates if there is more than one TARP-recipient in the syndicate and used as an alternative TARP variable. Because of high correlation between TARP dummy and different TARP infusion rates we run separate analysis for each of them. See table 2 for correlation analysis results. Lender characteristics are averaged across all banks including non-leads. As a result, for non-bank lead loans, we use participant bank information as lender characteristics. Borrower characteristics are uniquely defined for each loan and certain loan characteristics are converted from facility to package level if necessary.  $\beta_1$  captures differences between TARP and non-TARP loan syndicate structures. While  $\gamma, \delta, \theta$  represent partial impacts of bank, loan and borrower characteristics respectively and  $\varphi$  represents time fixed effects.

Based on the argument that TARP was effective both in terms promoting flow of fund and preventing participants' opportunistic behavior (Gaby & Walker, 2011; Hollowell, 2011; Huerta et.al, 2011; Yildirim & Pai, 2012) we propose the following alternative hypothesis.

*H1a: TARP promotes opportunistic behavior of its participants due to its low cost funds resulting in more concentrated syndicate structure.*

Moreover, in order to check robustness of TARP impact we conduct the same analysis for various subsamples. We subsample by above/below median loan size, median loan maturity, median average bank asset size and median average bank tier 1 capital ratio.

In addition to that, in order to highlight the significance of TARP impact beyond lender roles, we conduct a separate analysis at unique parent bank-package level. The analysis is determined by following Model (2).

$$\begin{aligned}
 & \text{Bank share}_{i,j,t} = \\
 & \beta_0 + \beta_1 \text{Lead dummy}_{i,j,t} + \beta_2 \text{TARP variable}_{i,j,t} + \beta_3 \text{Lead dummy} * \text{TARP variable}_{i,j,t} + \gamma * \\
 & \text{Lender characteristics}_{j,t-1} + \delta * \text{Loan characteristics}_{i,t} + \theta * \text{Borrower characteristics}_{i,t-1} + \varphi * \\
 & d\text{Quarter}_t + \varepsilon_{i,t} \quad (2)
 \end{aligned}$$

Definition of variables and parameters stays the same as in Model 1 and *Lead dummy*<sub>*i,j,t*</sub> indicates a dummy variable for lender role and takes a value of 1 if a bank is a lead arranger and takes 0 otherwise. We define banks as lead arrangers if they are granted with lead arranger credit following Ertan (2013). Aside from the coefficient of interest,  $\beta_2$ , we are interested in  $\beta_3$  to examine whether TARP impact changes with the lender role.

Because lead arrangers play significant role in defining whom to partner with, thus determining syndicate structure (Sufi, 2007; Lin et.al 2012), we hypothesize the following:

*H2a: TARP impact will be stronger for lead arrangers.*

#### **IV. Diagnostic tests**

*Summary statistics*

Our final sample consists of 6,290 unique loans issued between the first quarter of 2004 to the last quarter of 2011. We run our analysis at package level with at least one bank. In case of multiple banks cooperating in the syndicate we take the average of bank characteristics to convert to package level. We describe all the variables used in this study along with their calculations in Appendix of the paper. We provide our descriptive statistics by syndicate structure variables, TARP variables, bank, borrower and loan characteristics and for the two samples for the comparison purpose.

[Insert Table 1 here]

Looking at our syndicate structure variables we find that average number of banks at the package level is 2.62 with an average of 0.31 lead banks for our baseline sample. The statistics is lower as compared to average bank of 3.15 with an average of 1.13 lead banks in lead bank only sample. For 25th percentile of our sample we find on an average of 1 bank at package level while for 75th percentile there are 4 banks on an average at package level. While share of an average bank in loan has a mean value of 12.09% the lead bank has 40.98% meaning lead banks do play a major role in the syndicate structure. Our Herfindahl index has a mean value of 979.56 for all banks and 3,325.46 for lead banks indicating a highly concentrated syndicate structure in terms of lead banks. We provide descriptive statistics for different TARP related variables under subheading TARP variables. We identify recipients of TARP at lenders level and recognize loan/package as TARP loan/package if any of the bank in the syndicate is a TARP recipient bank. We believe that additional funding in a form of TARP increases liquidity and results in higher contribution by bank in syndicate structure. We measure TARP infusion rates as a ratio of

TARP funding over tier 1 capital, total capital, risk-weighted capital and total equity capital<sup>††</sup>. We use different measures for performing our robustness checks. Our TARP loan infusion rates show similar distributions with mean value of 0.17%.

We average our bank characteristics across all banks in the syndicate at loan level. Each bank and borrower variables are scaled by respective asset size. Mean of tier 1 is 10% and 9% for baseline and lead only samples reflecting that the banks have enough capital reserve to meet regulatory requirements. On an average these banks have cash holding of \$0.06 billion with a median cash balance of \$0.05 billion as compared to \$0.04 billion and \$0.03 billion of lead only sample. Looking at leverage ratio we don't find that these banks are highly levered and their leverage ratio has a mean value of 7 % with a median of 2%. In general lender variables imply that average banks are large in terms of their asset size, cash, and loan allowances which is consistent with supplying large scale syndicated loans. Moreover average lead banks fund about 53% of their assets by deposits to support too-big-to-fail-out argument. We uniquely identify a borrower per package. All borrower variables are scaled by respective borrower asset size except for ratios. In terms of size, average borrower is 1/3 of average bank size implying bank's incentive for diversification and seeking loan syndication. Our data shows that more than half of the borrowers are unrated, yet with mean profitability of 8% as measured by return on assets and low level of leverage and cash flow volatility. As for loan characteristics we consider loan maturity, loan size, loan security and loan refinancing. Average loan size in our sample is about 74% of the borrower's size, indicating higher leverage with mean maturity of 3.4 years which is equivalent to 7.11 in logarithm days. While most of deals are secured, they are issued for refinancing purpose which may indicate higher risk.

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<sup>††</sup> Although we compute and analyze for various TARP infusion rates, we report results for TARP infusion rate 3 only. Other TARP infusion rates result in similar outcomes and available upon request.

We report the correlation of the variables used in the main model in Table 2. We report correlation of TARP variables and lender characteristics in panel A and correlation between borrower characteristics and loan characteristics in panel B.

[Insert Table 2 here]

We take average for lender characteristics at package level. Further we find high correlation among different measures of TARP, lender past experience, and lender-borrower past relationship variables. Therefore, we only use one of the measures of each variable in our regression model. As expected we can see (Panel A) that TARP loan dummy and TARP loan infusion are highly correlated and significant. Further we can see that lender liquidity and leverage ratio (Panel A) are negatively and significantly correlated with lenders size meaning as lender becomes bigger it affects the leverage and liquidity negatively. All other correlations are very much in line with our expectations. In panel B we report correlation between borrower characteristics and loan characteristics. Notice that Tobin's Q for borrower is positively related to R&D rate, leverage, cash holdings and negatively related to profitability, size and tangibility. Further we can see that size of the loan and profitability are positively and significantly correlated. Overall correlation matrix shows that our selection of variables is not highly correlated and can be used for our study. In other words we do not find any multi-collinearity problem in selection of our variables.

Further we conduct mean different t-tests for group mean differences between TARP and non-TARP banks and also between lead and participant banks. We present out mean difference tests results in table 3. In panel A we present mean differences for TARP and non-TARP banks

and panel B presents mean differences between Lead and participant banks. Number of observations for our sample is 16,472.

[Insert table 3 here]

Our results for TARP and non-TARP in panel A shows that majority of variables are different and highly significant meaning there is difference between both the samples. Looking at the asset we can see that TARP banks have a mean asset value of \$727.77 Billion vs. \$477.42 Billion for non-TARP and difference is highly significant at 1% significance level. Our result confirms that TARP banks are bigger in size. In terms of risk-weighted asset and deposit we don't find any difference between TARP and non-TARP banks. Tarp bank share is much higher at 10.22% versus 7.32 % for non-tarp banks and again mean difference is highly significant meaning TARP banks contributed significantly higher amount to syndicated loan as compared to non-TARP banks. Further our results show that TARP banks have significantly higher tier 1 capital ratio, cash, and leverage ratio. Our results are consistent with too-big-to-fail argument .In panel B we present mean differences between Lead and participant banks. Our results show significant differences in all bank characteristics except loan allowance rate. Lead banks are much bigger in size and have significantly more assets than participant banks. We also find that lead banks have significantly more industry experience versus participant banks. Our results are as per our expectations and previous findings in existing literature.

## **V. Results and discussion**

Further we conduct our regression analysis and robustness checks for our main results. First we conduct our baseline regression where our dependent variable is a syndicate structure variable measured by four different measures namely number of banks, number of lead banks in the



syndicate, average bank share in the syndicate and Herfindahl index. We use these measures as dependent variable to measure our syndicate concentration. Our main independent variable in the regression model is a TARP variable measured by either TARP loan dummy or TARP loan infusion 3. TARP loan dummy takes value of 1 if any of banks in syndicate is TARP recipient at the time of deal activation and we calculate TARP loan infusion rate 3 as total TARP amount over risk-weighted assets. We take average of lender characteristics at package level. For non-bank lead loans we use participant banks information in determining lender characteristics. Our coefficient estimates are based on the robust standard errors clustered at the package level. We also control for year-quarter time fixed effect. We present our baseline regression results in table 4.

[Insert table 4 here]

If TARP were efficient in creating flow of funds while preventing moral hazard behaviors of its recipient banks during financial crisis to meet its purpose, we could expect that TARP loans to be more diversified. We argue that with more funding available from government bail-outs TARP banks are under close monitoring of Federal Reserve and expected to maintain less concentrated risk exposures. Therefore at loan level, syndicate structure is formed such that larger number of total banks and larger number of total lead banks are involved in one syndicate with lesser mean lead bank share and lower overall Herfindahl index of loan concentration as compared to non-TARP loans. Total sample size for our sample for regression analysis consists of 6,290 unique packages indicating most of the lead arrangers to be non-bank financial institutions. For non-bank lead lenders, we use participant bank information to proxy lender specific characters and when there are more than one participant banks in a package we take average values of each variable. We control for bank, borrower and loan characteristics and year

fixed effect with robust standard error clustered at package level. Our regression results with TARP loan dummy shows TARP has significant effect on all four different measures of syndicated structure. We find positive and significant effect of TARP on number of banks meaning if we have TARP recipient in the syndicate, syndicated structure becomes more diversified. We find negative association between TARP and number of leads, Bankshare and HHI. All other control variables are significant except few variables.

As our results for number of banks are highly significant in table 4 we further subsample our data based on median values in terms of median loan size, loan maturity, the average bank asset size and the average bank Tier 1 capital ratio and perform robust OLS regression.

[Insert table 5 here]

We present our results for our different subsamples in table 5. Our dependent variable is number of banks measuring syndicate structure. Key independent variable is a TARP variable measured by either TARP loan dummy or TARP infusion rate 3. Panel A presents our results for TARP loan dummy and panel B presents results for TARP infusion rate 3. TARP loan dummy takes value of 1 if any of banks regardless of its role in the syndicate is the TARP-recipient at the time of deal activation and TARP infusion rate 3 is calculated as total TARP amount over risk-weighted assets. We control for lender, borrower and loan characteristics in our regression. Our results are highly significant for both above and below median subsamples in both panel A and B. Our results clearly show that both TARP and TARP infusion rate directly affects the syndicate structure measured in terms of number of banks meaning when there is at least one TARP

recipient in syndicated structure ,syndicated structure will be more diversified. Results from table 5 confirm our finding in baseline regression in table 4. Further we find that infusion rate has positive and significant association with diversification of syndicated structure.

Our results for robust regressions by subsamples for Number of lead banks, average banks shares and HH index are presented in tables 6, 7, and 8.

[Insert table 6 here]

[Insert table 7 here]

[Insert table 8 here]

As before we subsample by above/below median loan size, loan maturity, the average bank asset size and the average bank Tier 1 capital ratio. The dependent variable is a syndicate structure variable measured by number of lead banks. In each model we control for year fixed effect and standard errors are clustered at package level. Our results from these tables do not show any clear picture and our results are not significant.

## **VI. Additional analysis and Robustness check**

Because of significant difference in number of observations by lender roles at parent-package level, we further conduct analysis at parent bank-package level to control for bank roles in the syndicate. Remember that because multi-banks participate per package it is impossible to control for lender role at package-level. Table 9 shows our results for package-lender analysis. We run

regression of bank share on lender roles (Lead dummy equals to 1 if a bank plays a lead bank role, otherwise equal to 0), TARP-recipient dummy and interaction of the two terms while controlling for bank, borrower, loan characteristics and year fixed effects. Interestingly, our results show that while significance of TARP impact on average bank share remains valid with negative sign, it changes its sign with presence of lender role. We find negative impact of TARP on bank share to diversify syndicate loan structure in consistent with our previous results. If a bank is TARP recipient average bank share will be lower by 2% while 1% of TARP-infusion rate decreases bank share by 66% respectively after controlling bank roles in the syndicate. We find bank roles play significant roles in bank share consistent with agency theory hypothesis to decrease potential moral hazard issue. We find bank role to be significant determiner of bank share in the syndicate loan structure. In average lead bank receives higher share in the syndicate and amount of share increases with TARP effect. Also, lead banks increase its share by about 30.1% for both TARP dummy and TARP infusion rates. If TARP recipient plays lead bank role in the syndicate instead of negative impact of TARP on bank share, it increases its bank share by 7.7% for TARP dummy and by 397% for TARP infusion rate. Our results further supports agency theory that lead bank's incentive to keep larger bank share align with its monitoring responsibilities to stay in good standing under TARP.

## **VII. Conclusion**

In this paper we empirically examine the impact of regulatory intervention in terms of TARP on syndicated loan partnerships during the recent subprime mortgage crisis of 2008. Our findings show a positive and significant effect of TARP on number of banks meaning if we have TARP recipient in the syndicate, syndicated structure becomes more diversified. Furthermore we

find negative association between TARP and number of leads, Bankshare and HHI. Our results remain valid after the robustness checks and additional analysis.

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Appendix

Variable name	Variable definition
<i>Syndicate structure variables</i>	
Number of banks	Number of banks participated in a syndicated loan
Number of lead banks	Number of lead banks in a syndicated loan
Lead bank loan share	Lead bank loan share (in %) in a syndicate and average loan share if there are more than one lead banks. We replace missing values by 100% for packages whose number of lenders including non-banks equal to one.
Herfindahl index	Sum of bank share squares in the syndicate. The value of Herfindahl index ranges from 0 to 10,000.
<i>TARP variables</i>	
TARP loan dummy	Takes value of 1 if at least one lead bank in the syndicate is a TARP recipient and 0 if otherwise
TARP loan infusion 1	Average lead bank TARP infusion rates where TARP infusion 1 is total TARP investment is divided by tier 1 capital and calculated if the loan is issued while the bank is under TARP program. For loans whose either non-lead participants are TARP recipients or all participants are non-TARP recipients the value is equal to zero.
TARP loan infusion 2	Calculated the same as above, only denominator is regulatory capital of the TARP recipient
TARP loan infusion 3	Calculated the same as above, only denominator is risk weighted asset of the TARP recipient
TARP loan infusion 4	Calculated the same as above, only denominator is equity capital of the TARP recipient
<i>Lead bank characteristics</i>	
Lender size	Logarithm of lead bank assets in USD millions and average lead bank assets if there are more than one lead banks in a package: bhck2170 or rcf2170
Lender tier 1 capital ratio	Lead bank tier-I capital ratio and average lead bank tier-I capital ratios if there are more than one lead banks in a package: bhck8274/bhcka223 or rcf8274/rcfda223
Lender risk-weighted asset	Lead bank risk-weighted asset/total asset ratio and average of the ratios if there are more than one lead banks in a package: bhcka223/bhck2170 or rcfda223/rcfd2170
Lender deposit	Lead bank deposit to total asset ratio and average of the ratios if there are more than one lead banks in a package: (bhdm6631+ bhdm6636+ bhfn6631+ bhfn6636)/bhck2170 or rcf2200/rcfd2170
Lender cash (B\$)	Lead bank cash/total asset ratio and average of the ratios if there are more than one lead banks in a package: bhck0010/bhck2170 or rcf0010/rcfd2170
Lender loan allowance rate	Lead bank loan allowance/total asset ratio and average of the ratios if there are more than one lead banks in a package: bhck3123/bhck2170 or rcf3123/rcfd2170
Lender charge off rate	Lead bank loan charge off/total asset ratio and average of the ratios if there are more than one lead banks in a package: bhck4635/bhck2170 or rcf4635/rcfd2170

Lender ROA	Lead bank net income/total asset ratio and average of the ratios if there are more than one lead banks in a package: bhck4340/bhck2170 or riad4340/rcfd2170
Lender liquidity	Lead bank (cash+available for sale securities)/total asset ratio and average of the ratios if there are more than one lead banks in a package: (bhck0010+bhck1773)/bhck2170 or (rcfd0010+rcfd1773)/rcfd2170
Leverage ratio	Lead bank tier 1 capital/total asset and average of the ratios if there are more than one lead banks: bhck8274/bhck2170 or riad8274/rcfd2170
Average lender industry experience (#of deals)	Lead bank total number of deals in a 1-digit borrower sic code industry in the past 5 years for a bank/Total number of deals in a 1-digit borrower sic code industry in the past 5 years for all banks and average of the ratios if there are more than one lead banks in a package
Total lender industry experience (#of deals)	Sum of lead bank industry experience ratios where industry experience ratio by number of deals is lead bank total number of deals in a 1-digit borrower sic code industry in the past 5 years for a bank/total number of deals in a 1-digit borrower sic code industry in the past 5 years for all banks' ratios
Average lender industry experience (amount of deals)	Lead bank total USD volume of deals in a 1-digit borrower sic code industry in the past 5 years for a bank/Total USD volume of deals in a 1-digit borrower sic code industry in the past 5 years for all banks and average of the ratios if there are more than one lead banks in a package
Total lender industry experience (amount of deals)	Sum of lead bank industry experience ratio where industry experience ratio by USD volume of deals is lead bank total USD volume of deals in a 1-digit borrower sic code industry in the past 5 years for a bank/total USD volume of deals in a 1-digit borrower sic code industry in the past 5 years for all banks' ratios
Average lender-borrower past relationship (#of deals)	Lead bank total number of deals with the same borrower in the past 5 years/Total number of deals of the borrower from all banks in the past 5 years and average of the ratios if there are more than one lead banks in a package
Total lender-borrower past relationship (#of deals)	Sum of lead bank lender-borrower past relationship ratio where lender-borrower past relationship ratio by number of deals is lead bank total number of deals with the same borrower in the past 5 years/Total number of deals of the borrower from all banks in the past 5 years
Average-borrower past relationship (amount of deals)	Lead bank total USD volume of deals with the same borrower in the past 5 years/Total USD volume of deals of the borrower from all banks in the past 5 years and average of the ratios if there are more than one lead banks in a package
Total-borrower past relationship (amount of deals)	Sum of lead bank lender-borrower past relationship ratio where lender-borrower past relationship ratio by USD volume of deals is lead bank total USD volume of deals with the same borrower in the past 5 years/Total USD volume of deals of the borrower from all banks in the past 5 years
Top 10 lead lender/Total number of lenders (#of deals)	Number of top-10 lead banks/Total number of banks in the package where top-10 bank is determined by the number of deals it issued in the past 5 years as compared to all other lenders
Total top 10 lead lender (#of deals)	Total number of top-10 lead banks in the package where top-10 bank is determined by the number of deals it issued in the past 5 years as compared to all other lenders
Top 10 lead lender/Total number of lenders (amount of deals)	Number of top-10 lead banks/Total number of banks in the package where top-10 bank is determined by the USD volume of deals it issued in the past 5 years as compared to all other lenders
Total top 10 lead lender (amount of deals)	Total number of top-10 lead banks in the package where top-10 bank is determined by the USD volume of deals it issued in the past 5 years as compared to all other lenders

*Borrower characteristics*

Borrower S&P Rating	Existence of long term SP credit rating for the borrower in the previous quarter, it equals to 1 if the borrower were rated and 0 otherwise
Borrower Tobin's Q	Market Value of Total Assets/Book Value of Total Assets where Market Value of Total Assets is: $(cshoq * prccq + atq - ceqq - txdbq) / atq$ and $txdbq$ is replaced by zero if missing following Chu et.al 2014
Borrower R&D rate	Borrower Research and Development expense/Book value of total assets: $xrdq / atq$ and $xrdq$ is replaced by zero if missing following Chu et.al 2014
Borrower leverage	The sum of long-term debt and debt in current liabilities divided by total assets: $(dlttq + dlcq) / atq$
Borrower profitability	Operating income before depreciation/total assets: $oibdpy / atq$
Borrower cash holding	Cash/Book value of total assets: $cheq / atq$
Borrower size	The natural log of total assets measured in millions of US dollars: $\ln(atq * currtq)$
Borrower tangibility	Net property, plant and equipment divided by total assets: $ppentq / atq$
Borrower cash flow volatility	Standard deviation of previous 4 quarter cash flows where cash flow is $(ibq + dpq) / saleq$ and $dpq$ is replaced by zero if missing following Chu et.al 2014

*Loan characteristics*

Loan maturity	The natural log of loan maturity measured in days. Maturity is calculated as the difference between latest facility end date and earliest facility start date at the package level
Loan size	The natural log of loan amount measured in millions of USD
Loan security	Dummy equal to 1 if loan is secured, otherwise 0. If at least one facility of a package is secured, the package is considered as secured and is replaced by zero if missing
Loan purpose dummies	Loan purpose dummy is coded as follows: 1=Corporate purpose, 2= Working capital, 3=Takeover, 4=Debt repayment, 5=acquisition, 6=backup and 7=LBO, 8=Recapitalization and 9=others
Loan refinancing	Dummy equal to 1 if loan is refinanced, otherwise 0 and is replaced by zero if missing



Table 1  
Summary statistics

Descriptive statistics are summarized at package level. Panel A shows results for all packages and Panel B shows results for lead only packages. When there are more than one banks lender characteristics are averaged to be converted to package level. Different measures for TARP and lender past experience and lender-borrower past relationship variables are computed. The variable descriptions are in appendix A.

Panel A: Summary statistics for all packages

	N	mean	sd	median	p25	p75
<i>Syndicate structure variables</i>						
Number of banks	6290	2.62	1.88	2.00	1.00	4.00
Number of lead banks	6290	0.31	0.54	0.00	0.00	1.00
Lead bank loan share	6290	12.09	26.60	0.00	0.00	8.96
Herfindahl index	6290	979.56	2636.39	0.00	0.00	318.22
<i>TARP variables</i>						
TARP loan dummy	6290	0.09	0.29	0.00	0.00	0.00
TARP loan infusion 1	6290	0.02	0.07	0.00	0.00	0.00
TARP loan infusion 2	6290	0.02	0.05	0.00	0.00	0.00
TARP loan infusion 3	6290	0.00	0.01	0.00	0.00	0.00
TARP loan infusion 4	6290	0.02	0.06	0.00	0.00	0.00
<i>Lead bank characteristics</i>						
Lender size	6290	19.58	1.29	19.87	18.77	20.49
Lender tier 1 capital ratio	6290	0.10	0.02	0.09	0.08	0.11
Lender risk-weighted asset	6290	0.77	0.14	0.76	0.71	0.83
Lender deposit	6290	0.59	0.11	0.60	0.53	0.67
Lender cash (B\$)	6290	0.06	0.05	0.04	0.03	0.07
Lender loan allowance rate	6290	0.01	0.00	0.01	0.01	0.01
Lender charge off rate	6290	0.00	0.00	0.00	0.00	0.00
Lender ROA	6290	0.01	0.00	0.01	0.00	0.01
Lender liquidity	6290	0.22	0.09	0.21	0.17	0.26
Leverage ratio	6290	0.07	0.02	0.07	0.06	0.08
Total lender industry experience	6290	18.03	14.41	15.06	6.72	25.70
Total-borrower past relationship	6290	93.54	53.56	99.49	50.00	120.37
Total top 10 lead lender	6290	1.55	1.36	1.00	1.00	2.00
<i>Borrower characteristics</i>						
Borrower S&P Rating	6290	0.59	0.49	1.00	0.00	1.00
Borrower Tobin's Q	6290	1.74	0.98	1.46	1.15	2.00
Borrower R&D rate	6290	0.00	0.01	0.00	0.00	0.00
Borrower cash holding	6290	0.09	0.12	0.05	0.02	0.12
Borrower leverage	6290	0.27	0.20	0.25	0.13	0.37
Borrower profitability	6290	0.08	0.08	0.07	0.04	0.11
Borrower size	6290	7.67	1.78	7.55	6.44	8.86
Borrower tangibility	6290	0.33	0.26	0.25	0.11	0.53
Borrower cash flow volatility	6290	1.89	129.55	0.02	0.01	0.05
<i>Loan characteristics</i>						
Loan maturity	6290	7.20	0.59	7.51	7.00	7.51
Loan size	6290	5.82	1.36	5.86	5.02	6.72
Loan security	6290	0.43	0.49	0.00	0.00	1.00
Loan refinancing	6290	0.78	0.41	1.00	1.00	1.00

Panel B: Summary statistics for lead only packages

	N	mean	sd	median	p25	p75
<i>Syndicate structure variables</i>						
Number of banks	1753	3.15	2.21	3.00	1.00	5.00
Number of lead banks	1753	1.13	0.35	1.00	1.00	1.00
Lead bank loan share	1753	40.98	37.70	20.00	11.00	100.00
Herfindahl index	1753	3,325.46	4,142.22	806.25	272.22	10,000.00
<i>TARP variables</i>						
TARP loan dummy	1753	0.08	0.27	0.00	0.00	0.00
TARP loan infusion 1	1753	0.02	0.06	0.00	0.00	0.00
TARP loan infusion 2	1753	0.01	0.04	0.00	0.00	0.00
TARP loan infusion 3	1753	0.17%	0.01	0.00	0.00	0.00
TARP loan infusion 4	1753	0.01	0.05	0.00	0.00	0.00
<i>Lead bank characteristics</i>						
Lender size	1753	20.14	1.54	20.88	19.54	21.10
Lender tier 1 capital ratio	1753	0.09	0.02	0.09	0.08	0.11
Lender risk-weighted asset	1753	0.73	0.12	0.71	0.68	0.76
Lender deposit	1753	0.53	0.12	0.50	0.45	0.60
Lender cash (B\$)	1753	0.04	0.03	0.04	0.03	0.05
Lender loan allowance rate	1753	0.01	0.00	0.01	0.01	0.01
Lender charge off rate	1753	0.00	0.00	0.00	0.00	0.00
Lender ROA	1753	0.01	0.00	0.00	0.00	0.01
Lender liquidity	1753	0.19	0.08	0.18	0.13	0.22
Leverage ratio	1753	0.07	0.02	0.06	0.06	0.08
Total lender industry experience	1753	9.65	6.64	8.73	4.66	13.95
Total-borrower past relationship	1753	48.21	32.36	33.33	22.73	66.67
Total top 10 lead lender	1753	0.69	0.56	1.00	0.00	1.00
<i>Borrower characteristics</i>						
Borrower S&P Rating	1753	0.49	0.50	0.00	0.00	1.00
Borrower Tobin's Q	1753	1.85	1.10	1.52	1.16	2.14
Borrower R&D rate	1753	0.00	0.01	0.00	0.00	0.00
Borrower cash holding	1753	0.11	0.14	0.05	0.02	0.14
Borrower leverage	1753	0.24	0.19	0.22	0.09	0.33
Borrower profitability	1753	0.08	0.08	0.07	0.03	0.11
Borrower size	1753	7.19	1.96	7.19	5.79	8.52
Borrower tangibility	1753	0.31	0.26	0.23	0.10	0.50
Borrower cash flow volatility	1753	0.24	4.23	0.02	0.01	0.05
<i>Loan characteristics</i>						
Loan maturity	1753	7.11	0.64	7.49	7.00	7.51
Loan size	1753	5.30	1.64	5.46	4.11	6.52
Loan security	1753	0.47	0.50	0.00	0.00	1.00
Loan refinancing	1753	0.78	0.41	1.00	1.00	1.00

Table 2  
Pearson's correlations

This table reports the Pearson correlations. Panel A reports correlations among the TARP-variables and lender characteristics and Panel B reports correlations among borrower and loan characteristics. All lead lender characteristics are averaged at package level. Different measures for TARP and lender past experience and lender-borrower past relationship variables are computed. For highly correlated TARP and lender past experience and lender-borrower past relationship variables, only one of the measures of the variables is used for the regression and we report the one that we used in the regression. The star (\*) represents correlations that are significant at the 5 percent level. The variable descriptions are in appendix A.

Panel A. TARP variables and lender characteristics

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
[1] TARP loan dummy	1													
[2] TARP loan infusion	0.96*	1												
[3] Lender size	0.03	-0.04	1											
[4] Lender tier 1 capital ratio	0.15*	0.17*	-0.24*	1										
[5] Lender risk-weighted asset	0.03	0.07*	-0.52*	-0.24*	1									
[6] Lender deposit	0.03	0.08*	-0.69*	0.01	0.62*	1								
[7] Lender cash (B\$)	0.16*	0.18*	-0.15*	0.35*	-0.19*	0.09*	1							
[8] Lender loan allowance rate	0.35*	0.36*	-0.04	0.33*	0.14*	0.32*	-0.03	1						
[9] Lender ROA	-0.25*	-0.25*	-0.03	-0.01	0.11*	0.10*	-0.05*	-0.23*	1					
[10] Lender liquidity	0.09*	0.10*	-0.48*	0.34*	-0.03	0.46*	0.43*	0.16*	0.06*	1				
[11] Leverage ratio	0.19*	0.24*	-0.61*	0.67*	0.53*	0.52*	0.16*	0.45*	0.03	0.33*	1			
[12] Lender industry experience	0.03	-0.02	0.58*	-0.08*	-0.31*	-0.43*	-0.08*	-0.02	0.03	-0.15*	-0.32*	1		
[13] Borrower past relationship	0.02	0.02	-0.23*	0.11*	0.13*	0.16*	0.02	0.02	-0.01	0.15*	0.18*	-0.03	1	
[14] Total top 10 lead lender	-0.05	-0.03	0.25*	0.04	-0.02	-0.15*	0.08*	0.10*	-0.10*	-0.31*	0.00	0.10*	-0.08*	1

Panel B. Borrower and loan characteristics

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
[1] Borrower S&P Rating	1												
[3] Borrower Tobin's Q	-0.18*	1											
[3] Borrower R&D rate	-0.19*	0.30*	1										
[4] Borrower leverage	-0.25*	0.39*	0.45*	1									
[5] Borrower profitability	0.30*	-0.18*	-0.15*	-0.34*	1								
[6] Borrower cash holding	0.06*	0.19*	-0.29*	-0.11*	-0.03	1							
[7] Borrower size	0.69*	-0.23*	-0.26*	-0.27*	0.18*	0.07*	1						
[8] Borrower tangibility	0.21*	-0.14*	-0.22*	-0.37*	0.26*	0.11*	0.16*	1					
[9] Borrower cash flow volatility	-0.03	0.03	0.06*	0.16*	0.00	-0.29*	-0.06*	-0.01	1				
[10] Loan maturity	0.11*	-0.04	-0.13*	-0.14*	0.08*	0.10*	0.08*	0.12*	-0.01	1			
[11] Loan size	0.65*	-0.14*	-0.27*	-0.30*	0.23*	0.15*	0.84*	0.21*	-0.05*	0.31*	1		
[12] Loan security	-0.35*	-0.01	0.13*	0.12*	0.04	-0.12*	-0.49*	-0.06*	0.05*	0.04	-0.36*	1	
[13] Loan refinancing	0.14*	-0.15*	-0.20*	-0.25*	0.12*	0.06*	0.18*	0.10*	0.01	0.35*	0.31*	-0.03	1

Table 3  
T-test results

This table reports t-test results for group mean difference of bank characteristics. Panel A reports the difference between TARP and non-TARP groups and Panel B reports the difference between lead and participant banks for the unique package-bank sample of 16,472 observations. \*\*\* represents significance level of 1%.

Panel A: non-TARP and TARP difference

Variables	Non-TARP	Mean1	TARP	Mean2	MeanDiff
Bank share	15,523	7.32	949	10.22	-2.903***
Lender \$B assets	15,523	477.42	949	727.77	-250.35***
Lender tier 1 capital ratio	15,523	0.10	949	0.12	-0.02***
Lender risk-weighted asset	15,523	0.78	949	0.78	0.01
Lender deposit	15,523	0.60	949	0.61	0.00
Lender cash	15,523	0.06	949	0.08	-0.02***
Lender loan allowance rate	15,523	0.01	949	0.02	-0.01***
Lender charge off rate	15,523	0.00	949	0.01	-0.01***
Lender ROA	15,523	0.01	949	0.00	0.01***
Lender liquidity	15,523	0.22	949	0.23	0.00
Leverage ratio	15,523	0.07	949	0.09	-0.01***
Lender industry experience	15,523	6.88	949	7.01	-0.13
Lender-borrower past relationship	15,522	35.65	949	36.80	-1.15
Top 10 dummy	15,523	0.59	949	0.52	0.07***

Panel B: Participant and lead difference

Variables	Participant	Mean1	Lead	Mean2	MeanDiff
Bank share	14,494	3.33	1,978	37.94	-34.60***
Lender \$B assets	14,494	419.78	1,978	1019.91	-600.13***
Lender tier 1 capital ratio	14,494	0.10	1,978	0.09	0.01***
Lender risk-weighted asset	14,494	0.79	1,978	0.73	0.06***
Lender deposit	14,494	0.61	1,978	0.53	0.09***
Lender cash	14,494	0.07	1,978	0.05	0.02***
Lender loan allowance rate	14,494	0.01	1,978	0.01	0
Lender charge off rate	14,494	0.00	1,978	0.00	-0.00***
Lender ROA	14,494	0.01	1,978	0.01	0.00***
Lender liquidity	14,494	0.23	1,978	0.19	0.04***
Leverage ratio	14,494	0.08	1,978	0.07	0.01***
Lender industry experience	14,494	6.66	1,978	8.55	-1.9***
Lender-borrower past relationship	14,493	34.76	1,978	42.73	-8.00***
Top 10 dummy	14,494	0.59	1,978	0.60	-0.02

Table 4: Baseline OLS regressions

This table shows the results for baseline OLS regressions. The dependent variable is a syndicate structure variable measured by number of banks, number of lead banks in the syndicate, average bank share in the syndicate and Herfindahl index for the syndicate concentration. Key independent variable is a TARP variable measured by either TARP loan dummy or TARP infusion rate. TARP loan dummy takes value of 1 if any of banks regardless of its role in the syndicate is the TARP-recipient at the time of deal activation and TARP infusion rate 1, 2, 3 and 4 equals to total TARP amount over tier 1 capital, total regulatory capital, risk-weighted assets and total equity respectively. All lender characteristics are averaged by bank lenders at package level and year-quarter time fixed effect is controlled. For non-bank lead loans, participant bank information is used to determine lender characteristics. The coefficient estimates that are based on the robust standard errors clustered at the package level. The \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent levels respectively.

VARIABLES	#ofbanks	#ofleads	Bankshare	HHI				
TARP loan dummy	0.460***	-0.054*	-3.565**	-359.961**				
TARP loan infusion 3	14.591***	-1.567	-92.846*	-9,047.946*				
Lender size	-0.127***	-0.132***	0.048***	0.048***	0.508	0.544	14.510	18.091
Lender tier 1 capital ratio	-16.169***	-16.245***	-2.390**	-2.380**	16.338	17.062	4,050.289	4,125.465
Lender risk-weighted asset	-4.958***	-4.977***	-0.953***	-0.952***	-6.734	-6.782	-120.181	-128.111
Lender deposit	2.581***	2.557***	0.144	0.148	-13.424**	-13.119**	-1,251.634**	-1,218.842**
Lender cash (B\$)	-4.993***	-4.980***	-0.665***	-0.665***	-17.979*	-17.835*	-1,615.761*	-1,597.382*
Lender loan allowance rate	-13.874***	-13.280***	-5.851***	-5.879***	-283.818**	-282.552**	-27,135.991**	-26,913.693**
Lender ROA	-9.181**	-9.823**	-7.315***	-7.267***	-126.886	-125.742	-13,952.828	-13,898.919
Lender liquidity	-0.477**	-0.459**	-0.234**	-0.237**	4.265	4.003	630.464	602.022
Leverage ratio	33.063***	33.136***	7.043***	7.047***	45.621	46.737	814.880	954.585
Total lender industry experience	0.051***	0.051***	0.009***	0.009***	0.116***	0.117***	11.355***	11.562***
Total-borrower past relationship	0.006***	0.006***	-0.000	-0.000	-0.041***	-0.040***	-3.611***	-3.589***
Total top 10 lead lender	0.691***	0.694***	0.079***	0.079***	-0.279	-0.301	-38.445	-40.628
Borrower S&P Rating	0.024	0.022	-0.008	-0.007	-0.765	-0.742	-30.713	-28.304
Borrower Tobin's Q	-0.007	-0.007	0.014*	0.014*	1.497***	1.496***	153.975***	153.884***
Borrower R&D rate	-2.007**	-1.998**	2.494***	2.495***	198.730***	198.902***	20,198.800***	20,220.068***
Borrower cash holding	-0.375***	-0.369***	0.131**	0.131**	12.784***	12.737***	1,339.932***	1,335.074***
Borrower leverage	-0.118**	-0.115*	-0.071**	-0.071**	-6.239***	-6.259***	-571.998***	-573.920***
Borrower profitability	0.642***	0.637***	-0.301***	-0.301***	-23.575***	-23.539***	-2,444.733***	-2,441.157***
Borrower size	-0.026**	-0.025**	-0.010	-0.010	-0.634*	-0.637*	-55.965	-56.241
Borrower tangibility	0.002	0.006	0.051*	0.050*	2.964**	2.933**	202.463	199.189
Borrower cash flow volatility	-0.000***	-0.000***	-0.000***	-0.000***	-0.001***	-0.001***	-0.081***	-0.080***
Loan size	0.094***	0.095***	-0.104***	-0.105***	-9.026***	-9.032***	-880.182***	-880.715***
Loan maturity	0.084***	0.085***	-0.061***	-0.061***	-5.765***	-5.773***	-485.510***	-486.325***
Loan security	0.073***	0.073***	0.020	0.020	4.186***	4.192***	428.845***	429.504***
Loan refinancing	0.064***	0.065***	-0.016	-0.016	-3.067***	-3.070***	-363.491***	-363.776***
Constant	2.345***	2.442***	0.632**	0.620**	110.984***	110.138***	10,269.792***	10,182.831***
Observations	6,290	6,290	6,290	6,290	6,290	6,290	6,290	6,290
R-squared	0.834	0.834	0.201	0.201	0.391	0.391	0.372	0.373
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5  
Robust OLS regression (for number of banks) by subsamples

This table shows the robust regression results by different subsamples. We subsample by above/below median loan size, loan maturity, the average bank asset size and the average bank Tier 1 capital ratio. The dependent variable is a syndicate structure variable measured by number of banks. Key independent variable is a TARP variable measured by either TARP loan dummy or TARP infusion rate. TARP loan dummy takes value of 1 if any of banks regardless of its role in the syndicate is the TARP-recipient at the time of deal activation and TARP infusion rate 1, 2, 3 and 4 equals to total TARP amount over tier 1 capital, total regulatory capital, risk-weighted assets and total equity respectively. The same lender, borrower and loan characteristics are controlled as in our baseline regression. All lender characteristics are averaged by lenders at package level and year-quarter time fixed effect is controlled. For non-bank lead loans, participant bank information is used to determine lender characteristics. The coefficient estimates are based on the robust standard errors clustered at the package level. The \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Panel A: TARP variable measured by TARP dummy

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Loan size		Loan maturity		Average bank asset size		Average bank Tier 1 capital	
	>median	<median	>median	<median	>median	<median	>median	<median
TARP loan dummy	0.391***	0.440***	0.499***	0.415***	0.344***	0.518***	0.629***	-0.183
Lender characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Borrower characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Loan characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,177	3,113	3,429	2,861	3,145	3,145	3,144	3,146
R-squared	0.848	0.786	0.841	0.824	0.892	0.834	0.829	0.868

Panel B: TARP variable measured by TARP infusion rate 3

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Loan size		Loan maturity		Average bank asset size		Average bank Tier 1 capital	
	>median	<median	>median	<median	>median	<median	>median	<median
TARPlloan_inf3	12.134***	14.732***	14.631***	14.159***	10.687***	14.728***	21.400***	-6.229
Lender characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Borrower characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Loan characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,177	3,113	3,429	2,861	3,145	3,145	3,144	3,146
R-squared	0.848	0.786	0.841	0.824	0.891	0.833	0.829	0.868

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 6  
Robust OLS regression (for number of lead banks) by subsamples

This table shows the robust regression results by different subsamples. We subsample by above/below median loan size, loan maturity, the average bank asset size and the average bank Tier 1 capital ratio. The dependent variable is a syndicate structure variable measured by number of lead banks. Key independent variable is a TARP variable measured by either TARP loan dummy or TARP infusion rate. TARP loan dummy takes value of 1 if any of banks regardless of its role in the syndicate is the TARP-recipient at the time of deal activation and TARP infusion rate 1, 2, 3 and 4 equals to total TARP amount over tier 1 capital, total regulatory capital, risk-weighted assets and total equity respectively. The same lender, borrower and loan characteristics are controlled as in our baseline regression. All lender characteristics are averaged by lenders at package level and year-quarter time fixed effect is controlled. For non-bank lead loans, participant bank information is used to determine lender characteristics. The coefficient estimates are based on the robust standard errors clustered at the package level. The \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Panel A: TARP variable measured by TARP dummy

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Loan size		Loan maturity		Average bank asset size		Average bank Tier 1 capital	
	>median	<median	>median	<median	>median	<median	>median	<median
TARP loan dummy	-0.050	0.009	-0.126**	-0.012	-0.020	-0.052	-0.075**	-0.081
Lender characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Borrower characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Loan characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,177	3,113	3,429	2,861	3,145	3,145	3,144	3,146
R-squared	0.249	0.244	0.222	0.225	0.245	0.228	0.210	0.223

Panel B: TARP variable measured by TARP infusion rate 3

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Loan size		Loan maturity		Average bank asset size		Average bank Tier 1 capital	
	>median	<median	>median	<median	>median	<median	>median	<median
TARPloan_inf3	-1.388	0.361	-3.354*	-0.489	0.797	-1.454	-2.288*	-1.495
Lender characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Borrower characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Loan characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,177	3,113	3,429	2,861	3,145	3,145	3,144	3,146
R-squared	0.249	0.244	0.222	0.225	0.245	0.228	0.210	0.223

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 7  
Robust OLS regression (for average bank share) by subsamples

This table shows the robust regression results by different subsamples. We subsample by above/below median loan size, loan maturity, the average bank asset size and the average bank Tier 1 capital ratio. The dependent variable is a syndicate structure variable measured by average bank share. Key independent variable is a TARP variable measured by either TARP loan dummy or TARP infusion rate. TARP loan dummy takes value of 1 if any of banks regardless of its role in the syndicate is the TARP-recipient at the time of deal activation and TARP infusion rate 1, 2, 3 and 4 equals to total TARP amount over tier 1 capital, total regulatory capital, risk-weighted assets and total equity respectively. The same lender, borrower and loan characteristics are controlled as in our baseline regression. All lender characteristics are averaged by lenders at package level and year-quarter time fixed effect is controlled. For non-bank lead loans, participant bank information is used to determine lender characteristics. The coefficient estimates are based on the robust standard errors clustered at the package level. The \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Panel A: TARP variable measured by TARP dummy

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Loan size		Loan maturity		Average bank asset size		Average bank Tier 1 capital	
	>median	<median	>median	<median	>median	<median	>median	<median
TARP loan dummy	-0.288	-1.603	-3.249*	-3.204*	-2.686	-4.320**	-5.617***	-5.772
Lender characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Borrower characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Loan characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,177	3,113	3,429	2,861	3,145	3,145	3,144	3,146
R-squared	0.119	0.518	0.238	0.483	0.377	0.455	0.426	0.401

Panel B: TARP variable measured by TARP infusion rate 3

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Loan size		Loan maturity		Average bank asset size		Average bank Tier 1 capital	
	>median	<median	>median	<median	>median	<median	>median	<median
TARPloan_inf3	8.457	-40.511	-68.053	-83.910	-19.778	-118.827**	-180.654***	-93.012
Lender characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Borrower characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Loan characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,177	3,113	3,429	2,861	3,145	3,145	3,144	3,146
R-squared	0.119	0.518	0.237	0.483	0.377	0.455	0.426	0.401

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 8  
Robust OLS regression (for Herfindahl index) by subsamples

This table shows the robust regression results by different subsamples. We subsample by above/below median loan size, loan maturity, the average bank asset size and the average bank Tier 1 capital ratio. The dependent variable is a syndicate structure variable measured by Herfindahl index of syndicate concentration. Key independent variable is a TARP variable measured by either TARP loan dummy or TARP infusion rate. TARP loan dummy takes value of 1 if any of banks regardless of its role in the syndicate is the TARP-recipient at the time of deal activation and TARP infusion rate 1, 2, 3 and 4 equals to total TARP amount over tier 1 capital, total regulatory capital, risk-weighted assets and total equity respectively. The same lender, borrower and loan characteristics are controlled as in our baseline regression. All lender characteristics are averaged by lenders at package level and year-quarter time fixed effect is controlled. For non-bank lead loans, participant bank information is used to determine lender characteristics. The coefficient estimates are based on the robust standard errors clustered at the package level. The \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Panel A: TARP variable measured by TARP dummy

VARIABLES	(1) Loan size		(3) Loan maturity		(5) Average bank asset size		(7) Average bank Tier 1 capital	
	>median	<median	>median	<median	>median	<median	>median	<median
TARP loan dummy	-36.110	-173.012	-339.017*	-307.145	-281.450	-440.179**	-567.603***	-515.614
Lender characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Borrower characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Loan characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	0.089	0.513	0.224	0.470	0.345	0.441	0.416	0.376

Panel B: TARP variable measured by TARP infusion rate 3

VARIABLES	(1) Loan size		(3) Loan maturity		(5) Average bank asset size		(7) Average bank Tier 1 capital	
	>median	<median	>median	<median	>median	<median	>median	<median
TARPloan_inf3	880.155	-4,030.344	-7,408.340	-7,601.302	-1,444.770	-12,244.158**	-17,980.647***	-5,259.130
Lender characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Borrower characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Loan characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Loan purpose dummies	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,177	3,113	3,429	2,861	3,145	3,145	3,144	3,146
R-squared	0.089	0.513	0.223	0.469	0.345	0.441	0.416	0.376

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 9

Lender level analysis: regression of bank share in the syndicate on TARP participants by their roles in the syndicate

This table shows the results for OLS regressions on unique package-bank sample. Therefore it includes multiple observations in terms of package if there are more than one bank in the syndicate and they share the common borrower and the loan characteristics. The dependent variable is a syndicate structure variable measured by bank share in the syndicate. Key independent variable is an interaction of TARP variable and the bank role in the syndicate either to be a lead bank or a participant. TARP variable is measured by either TARP loan dummy or TARP infusion rate. TARP loan dummy takes value of 1 if any of the lead banks in the syndicate is the TARP-recipient at the time of deal activation and TARP infusion rate 1, 2, 3 and 4 equals to total TARP amount over tier 1 capital, total regulatory capital, risk-weighted assets and total equity respectively. All lender characteristics are specific to the observed bank and year-quarter time fixed effect is controlled. The coefficient estimates that are based on the robust standard errors clustered at the package level. The \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent levels respectively.

VARIABLES	(1) TARP dummy	(2) TARP infusion rate 3
Lead dummy	30.132***	30.038***
TARP variable	-2.032***	-66.902***
Lead dummy*TARP variable	7.752***	397.406***
Lender size	0.155	0.161
Lender tier 1 capital ratio	52.917***	53.059***
Lender risk-weighted asset	9.682***	9.642***
Lender deposit	-0.155	-0.187
Lender cash (B\$)	-0.000***	-0.000***
Lender loan allowance rate	-125.840***	-128.095***
Lender ROA	29.148	28.029
Lender liquidity	6.391***	6.374***
Leverage ratio	-48.721***	-48.749***
Total lender industry experience	0.035*	0.035*
Total-borrower past relationship	0.038***	0.038***
Total top 10 lead lender	-1.554***	-1.545***
Borrower Tobin's Q	0.556***	0.548***
Borrower S&P Rating	-0.490*	-0.496*
Borrower R&D rate	117.242***	116.703***
Borrower cash holding	3.910**	3.884**
Borrower leverage	-1.944**	-1.957**
Borrower profitability	-10.925***	-10.765***
Borrower size	-0.171	-0.171
Borrower tangibility	1.570***	1.572***
Borrower cash flow volatility	0.000	0.000
Loan size	-4.153***	-4.145***
Loan maturity	-3.111***	-3.114***
Loan security	1.677***	1.668***
Loan refinancing	-1.650***	-1.637***
Constant	39.208***	39.126***
Observations	16,471	16,471

R-squared	0.547	0.547
Time FE	YES	YES
Industry FE	YES	YES
Loan purpose dummies	YES	YES

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\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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