Decision-Making during the Credit Crisis:

Did the Treasury let Commercial Banks fail?

Ettore Croci[a], Gerard Hertig[b], and Eric Nowak[c*]

[a] *Università Cattolica del Sacro Cuore, Italy*

[b] *ETH Zurich, Switzerland*

[c] *Swiss Finance Institute and University of Lugano, Switzerland*

This Draft: December 14, 2015

Abstract

Limited attention has been paid to the comparative fate of banks benefiting from Capital Purchase Program (CPP) funding and less fortunate banks subject to FDIC resolution. We address this omission by investigating two core issues. One is whether commercial banks that ended up being subject to FDIC resolution received CPP funds. The other is whether the non-allocation of CPP funds made FDIC receivership more likely for viable commercial banks. Our findings show almost no overlap between CPP-funded and FDIC-resolved commercial banks, but we provide evidence that a significant number of FDIC-resolved banks could have avoided receivership if they had been allocated CPP funding. By comparing estimated funding and resolution costs we also show that bailing out more banks would have been cost-efficient. While our results do not allow for any policy suggestion on the optimality of bail-outs per se, they suggest that once a bail-out program is already on the table, it is better to err on the side of rescuing too many rather than too few banks.

JEL classification: G21, G28, G33, K23, K29

Keywords: Bankruptcy, Bail-out, Commercial Bank, CPP, Financial crisis, Resolution.

* We thank Anita Anand, Allen Berger, Barbara Casu, Jeffrey Gordon, Daniel Gros, Evren Ors, Jean-Charles Rochet, David Skeel, Remco Zwinkels and participants in the 2016 American Finance Association (AFA) Annual Meeting, 2015 American Law & Economics Association (ALEA) Conference, Luxembourg School of Finance (LSF) Conference on the European Sovereign Debt Crisis, CEPR-IMFS Conference on Monetary and Financial Stability, ETH Zurich Law & Finance Seminar and the 2014 Virginia Law School Law & Finance Seminar, ESCP Law & Finance Seminar, Lund University Seminar, NYU-ETH Zurich Law & Banking Conference, and WHU Otto Beisheim School of Management Seminar for their comments.

Decision-Making during the Credit Crisis:
Did the Treasury let Commercial Banks fail?

This Draft: December 14, 2015

Abstract

Limited attention has been paid to the comparative fate of banks benefiting from Capital Purchase Program (CPP) funding and less fortunate banks subject to FDIC resolution. We address this omission by investigating two core issues. One is whether commercial banks that ended up being subject to FDIC resolution received CPP funds. The other is whether the non-allocation of CPP funds made FDIC receivership more likely for viable commercial banks. Our findings show almost no overlap between CPP-funded and FDIC-resolved commercial banks, but we provide evidence that a significant number of FDIC-resolved banks could have avoided receivership if they had been allocated CPP funding. By comparing estimated funding and resolution costs we also show that bailing out more banks would have been cost-efficient. While our results do not allow for any policy suggestion on the optimality of bail-outs per se, they suggest that once a bail-out program is already on the table, it is better to err on the side of rescuing too many rather than too few banks.

JEL classification: G21, G28, G33, K23, K29

Keywords: Bankruptcy, Bail-out, Commercial Bank, CPP, Financial crisis, Resolution.

1. Introduction

Since September 15, 2008, the day Lehman Brothers filed a petition seeking relief under Chapter 11 of the US Bankruptcy Code, the Federal Deposit Insurance Corporation (FDIC) has been appointed as receiver for almost 500 banks.[1] This is more than ten times the number of banks subject to FDIC receivership during the expansion period that preceded the credit crisis (40 banks failed between October 2000 and September 15, 2008).

[Please insert Figure 1 about here]

It is an open question whether this increase in FDIC interventions is related to the decisions taken during the 2007-08 financial crisis by the US Treasury, and in particular by its management of the Capital Purchase Program (CPP) established under the Troubled Asset Relief Program (TARP). According to the Treasury, CPP "was launched to stabilize the financial system by providing capital to *viable* financial institutions of all sizes throughout the nation. Based on market indicators at the time, it became clear that financial institutions needed additional capital to absorb losses and restart the flow of credit to businesses and consumers".[2] The Treasury did not explicitly define *viability* nor the market indicators suited to measure it, except to point out that: "Participation is reserved for healthy, viable institutions that are recommended by their applicable federal banking regulator".[3] It follows that the Treasury had to avoid two types of mistakes: (i) subsidizing banks that were not viable (type I error); and (ii) not assisting banks that were viable (type II error).

[1] See FDIC, List of failed banks, available at fdic.gov (as of January 16, 2014).

[2] See http://www.treasury.gov/initiatives/financial-stability/TARP-Programs/bank-investment-programs/cap/Pages/overview.aspx (as of November 24, 2014).

[3] See http://www.treasury.gov/initiatives/financial-stability/glossary/pages/default.aspx (as of November 24, 2014).

Ideally, the proper way to deal with a *viable* bank facing difficulties in a financial crisis situation is to have the government intervene and provide some form of temporary aid (as in the case of the CPP).[4] Conversely, when providing temporary aid will not prevent a bank from failing during or after the crisis, it should be considered *non-viable* and restructured or wound-down. In the real world, however, insuring for the continuation of essential services can require the government to provide financial support to banks that may not be viable, especially if their failures could lead to a bank-run and result in the so-called *too-many-to-fail* effect (Brown and Dinç, 2011). In addition, non-viable banks may be bailed out due to pressures by politicians worried about the impact of bank failures upon their constituency (Blau et al., 2013), even though this kind of state aid is likely to merely delay resolution or liquidation. Such lobbying is not only increasing the costs of subsequent FDIC intervention (Liu and Ngo, 2014), but is also likely to lead to fire sales of bank assets that, in turn, affects the viability of additional banks (Caballero and Simsek, 2013).

These considerations highlight the practical importance of the decisions made by the Treasury during the credit crisis: (i) were CPP funds allocated to (*ex post*) non-viable banks? (ii) was the non-allocation of CPP funds a determinant factor of FDIC receivership for (*ex ante*) viable banks? Related to this, there is also the issue of whether the Treasury took optimal decisions once we properly account for the cost of FDIC interventions—in particular in view of the FDIC often carrying 80% of the losses resulting from the sale of resolved bank assets.[5]

This paper empirically investigates the decisions government officials took to accepting some banks into the CPP program and not supporting others that were thereafter subject to resolution. Our focus is on *commercial banks*, especially smaller ones, rather than on *bank holding companies*

[4] For a literature review, see Bolzico et al. (2007); Mishkin (2000).

[5] During the crisis there was a serious risk that the Treasury would have to bail-out the FDIC. See e.g. FDIC-Insured Institutions Lost $3.7 Billion in the Second Quarter of 2009, Press Release PR-153-2009, FDIC, http://www.fdic.gov/news/news/press/2009/pr09153.html (last accessed on April 23, 2014).

(BHCs). While many BHCs submitted applications to participate in the CPP program, they were usually under the control of their largest bank (Carnell et al., 2008). It follows that BHC-affiliated commercial banks were the most likely users of CPP funding, for two reasons. First, they were the legal entities in charge of lending to firms and individuals, and thus the intended recipients of CPP funding. Second, over half of the 707 applications approved and funded by the Treasury were submitted by institutions with less than $500 million in assets (Cornett et al., 2013), within which funding is more likely to trickle down to banking subsidiaries rather than to remain at the holding level. In addition, the focus on commercial banks allows for a cleaner analysis. On the one hand, it makes it possible to directly compare CPP bail-outs, which targeted BHCs as well as commercial banks, and FDIC resolutions, which were limited to commercial banks.[6] On the other hand, it allows for a within-the-same-market analysis of the competition impact of CPP bail-outs.

We examine whether banks that received CPP funds were systematically different from those that were not bailed-out and eventually faced FDIC resolution. More specifically, we try to understand whether CPP funding allocation was limited to viable banks in temporary distress, or whether the allocation contained a random component, respectively was driven by other considerations—for example political connections. While there are studies that identify the characteristics of banks that applied for and received CPP funds, we are not aware of any research that investigates systematic differences between CPP banks and banks that were later subject to FDIC resolution.

Our evidence shows that, by the end of 2014, only 19 of the banks resolved by the FDIC obtained financial support from the Treasury. In other words, there is almost no overlap between

[6] During the pre-Dodd-Frank Act period, which represent a significant part of our sample, FDIC powers were limited to the seizure and resolution of commercial bank affiliates within bank or financial holding companies. Post Dodd-Frank, the Treasury has (yet untested) powers to petition the DC court to appoint the FDIC as a receiver for systemically important institutions: see Jackson and Skeel (2012) and Scott (2012).

FDIC resolved banks and commercial banks that received (or whose bank holding companies received) CPP funding. The low number of failed banks within the CPP sample is consistent with the goal of limiting financial support to banks that *temporarily* needed additional capital but were healthy otherwise.

Furthermore, our probit and hazard rate models shed light on the criteria the Treasury is likely to have used to identify banks that were viable post-crisis and thus deserved CPP funding. Compared to FDIC resolved banks, CPP funded banks were *generally* larger and older, marginally more capitalized, had less cash and non-performing assets, and relied less on brokered deposits. These criteria may be deemed suitable for a viability analysis (and interpreted as evidence of the Treasury having done a good job in identifying banks that deserved bailout money), as a mere 3.6% of CPP banks proved to be non-viable *ex post*.[7]

However, in many instances the financial situation of FDIC resolved banks and CPP funded banks did not differ at the onset of the crisis. By matching banks that did get CPP funding (CPP banks) to banks with *similar characteristics* that did not get CPP funding (non-CPP banks), we provide evidence suggesting that CPP funding turned out to be crucial for a bank's survival. More specifically, we find that non-CPP banks were almost six times more likely to fail within five years from the beginning of the crisis than CPP banks. While only 19 CPP banks out of 826 (2.3%) went bankrupt, 110 out of the 826 non-CPP matching banks had to face FDIC resolution over the next five years (13.3%). Since we are comparing banks that were close to identical at the beginning of the crisis, it appears that the Treasury funding allocation was instrumental in increasing the likelihood of

[7] Additional evidence that the bailout effort was overall profitable comes from the numbers that the Obama administration provided on December 19, 2014, the day Treasury Secretary Jacob J. Lew declared the bailout programs officially terminated with a profit of about $15bn. See for example: Weisman, Jonathan, "U.S. declares bank and auto bailouts over; and profitable", New York Times, December 19, 2014, available at http://www.nytimes.com/2014/12/20/business/us-signals-end-of-bailouts-of-automakers-and-wall-street.html?_r=0.

bank survival. This finding suggests that the Treasury may have been too restrictive in selecting CPP banks.

This is a somewhat puzzling result. It cannot be attributed to limited availability of funds, as the Treasury only allocated 82% of the available CPP money ($205bn out of $250bn). It is also unlikely to be due to the Treasury trying to minimize macroeconomic and informational rents associated with CPP funding.[8] Our findings are related to small commercial banks where the benefits in terms of rent limitation pale in comparison to the corresponding increase in resolution costs.

Alternatively, the Treasury's approach to CPP funding could be interpreted as an attempt to minimize the competitive distortions that have been associated with the provision of government subsidies. For example, Berger and Roman (2013) provide evidence of TARP-banks increasing their market share and market power relative to non-TARP banks. However, the validity of this result has been questioned by Koetter and Noth (2015). Our evidence at the commercial bank level provides additional reasons to doubt that government funding significantly altered competition. After we match CPP banks to comparable non-CPP banks, we find that the two groups have similar post-crisis performance in terms of ROA and ROE. We interpret this absence of abnormal performance as evidence of CPP funding having a limited impact on competition, the latter being mostly confined to CPP funding increasing the likelihood of survival of their recipients.

One could also argue that the Treasury limited the provision of CPP funding to avoid giving the impression of wasting taxpayers' money, in particular in the wake of politically motivated claims that the Treasury tended to overvalue bank assets (Bebchuk 2009). However, the available evidence points towards politics generally increasing rather than decreasing the bailout probability (Duchin and Sosyura, 2012; Liu and Ngo, 2014). In fact, the Treasury's restrictive funding approach is more likely to reflect conservatism in assessing bank viability, in view of the credit crisis generally

[8] See above note 2.

prompting banks to overstate the value of distressed assets (Huizinga and Laeven, 2012) and to understate their portfolio risk (Vallascas and Hagendorff, 2013).

To be sure, this does not mean that all resolved banks deserved CPP funding or would have survived if they had gotten CPP funding. On the other hand, the fact that non-CPP banks were almost six times more likely to fail than their matching CPP peers is evidence pointing towards the US Treasury having been overly conservative when it came to bailing out small commercial banks.

More importantly, it would have cost less to provide a significant number of matching banks with CPP funding than have deposit insurance covering the losses induced by their failures. To begin with, using estimated loss projections provided by the FDIC, we find that the costs of failure are higher than bailout costs would have been for about *all* matching failed banks. Second, even under a worst case CPP scenario under which government funding would be completely unrecoverable in case of failure, we still find it optimal to bail out at least more than half of the failed banks. Third, assuming a best case FDIC intervention scenario under which resolution is undertaken at the first sign of bank failure, i.e., at the time of the first enforcement action against the bank, resolution would have been more expensive than bailout for well above a third of the banks. Again this does not justify saving *all* banks, but it definitely questions the validity of a strategy that generally denies bailout funding to banks *matching* those that benefited from CPP funds.

We offer several contributions to the literature. On a general level, we provide evidence about the viability of smaller banks, an important component of the US banking system. More specifically, we firstly add to the growing literature on the effect of CPP bail-outs (Bayazitova and Shivdasani, 2011; Berger and Roman, 2013; Berger et al., 2013; Black and Hazelwood, 2013; Duchin and Sosurya, 2012; Duchin and Sosurya, 2014; Li, 2012; Ng et al., 2011;). We investigate an issue none of the above contributions did, i.e. whether it would have been preferable to have some CPP banks subject to FDIC resolution or vice versa.

Second, we extend the literature on bank failures. James (1991) examined bank failures in the 1980s, finding that the loss on assets is on average 30% of the failed bank's assets. Bennett and Unal (2015) analyze over 1,000 bank failures from 1986 to 2008 and estimate the total resolution costs to be 23% of total asset value in the quarter before failure. Recent studies have investigated various factors that contributed to commercial bank failures during the financial crisis of 2007-2008, like real estate investments (Cole and White, 2012); income from non-traditional banking activities (DeYoung and Torna, 2013); lack of capital (Berger and Bouwman, 2013). However, none of these studies attempted to establish a link between bank failure and CPP funding management.

The organization of the paper is as follows. Section 2 discusses the institutional background of CPP funding and FDIC resolutions. Section 3 introduces the sample and the data. Section 4 presents the empirical analysis. Section 5 discusses the optimality of rescuing failed banks. Finally, Section 6 provides our conclusions.

2. CPP Funding & FDIC Resolution: Institutional Background

On October 14, 2008, less than a month after Lehman Brothers' Chapter 11 filing, the US Treasury announced the Capital Purchase Program (CPP). The aim was to increase the flow of financing to the U.S. economy — there was a significant decrease in bank lending during the crisis (Ivashina and Scharfstein, 2010)—by reinforcing the equity position of viable financial institutions.

Participation was voluntary, but eligible institutions were encouraged to apply, especially those considered of *systemic* importance. As shown by Wells Fargo's reluctance to participate, not all banks were enthusiastic about getting Treasury funding.[9] This was at least partly because CPP

[9] See Damian Paletta, Jon Hilsenrath and Deborah Solomon, *At Moment of Truth, U.S. Forced Big Bankers to Blink*, The Wall Street Journal, October 15, 2008, available online at http://online.wsj.com/news/articles/SB122402486344034247

participation required compliance with executive compensation restrictions. But reluctance to participate was also fueled by dilution effects. Nevertheless, Duchin and Sosyura (2012) find that the overwhelming majority (80%) of public firms eligible to participate submitted CPP applications. They interpret this finding as a confirmation of the attractiveness of CPP financial conditions and of the program's simplicity. To get funding, banks had to issue preferred shares (the dividend being set at 5% for the first five years, 9% thereafter) and warrants, so as to enable taxpayers to share the profits bailed-out institutions were expected to make once markets had recovered.

Banks organized under US law and not controlled by a foreign entity were generally eligible to participate in the CPP. Applicants were required to provide basic information about themselves and the amount of preferred shares they wanted the US Treasury to acquire. Submissions had to be made to the primary supervisory authority, i.e. the Office of the Comptroller of the Currency (OCC) for federally chartered banks; the Federal Reserve Board for state chartered banks members of the Federal Reserve System (FRS); and the FDIC for state chartered banks not members of the FRS. Bank holding companies were additionally required to submit an application to the supervisor of the largest insured deposit institution they controlled. These applications were processed by the Treasury, working in consultation with the supervisory authorities. Once it had made a preliminary decision, the Treasury notified the applicant. To the extent there was preliminary acceptance into the program, the financial institution had to submit its final documentation within 30 days.

The criteria used to approve CPP funding have not been made public (Ng et al., 2011). The Treasury did not release details of the applicants' list to the public either (Cornett et al., 2013; Duchin and Sosyura, 2012). According to Cornett et al. 2013, a large number of banks withdrew their CPP application, either voluntarily (despite being qualified) or under pressure (banking authorities having indicated that they would not qualify). There is also some evidence that banks were asked by federal regulators not to apply. However, in the absence of publicly available official records, all we know for sure is that the Treasury (i) provided some guidance to assist banking supervisors in their

reviewing of CPP applications; and (ii) determined the allocation of CPP funds based upon an overall viability assessment by the responsible banking supervisor.[10]

CPP investments amounted to $205 billion and represented approximately 30% of the funding available under TARP. The largest investment was $25 billion, the smallest $301'000, with the last CPP funding taking place in December 2009. While impressive on paper, these numbers were relatively small compared to the size of the banking industry.[11] This is in line with the Treasury's claim that its investments targeted viable banks—a point also made clear by capping CPP equity injections at 3% of total risk weighted assets (5% if the bank had less than $500 million in total assets).

There is some evidence that many of the smaller CPP beneficiaries (372 out of the 656 banks benefiting from preferred stocks investments) have been both reluctant to exit the program and prone to miss their dividend payments to taxpayers (Wilson 2013), raising doubts about their long-term viability. There is also evidence that these banks are weaker than the healthier banks that have exited the CPP program (SIGTARP 2012, Special SBLF, p. 15).

Given the severity of the credit crisis, the increase in FDIC bank resolutions does not come as a surprise. The FDIC has receivership authority over all national banks (12 U.S.C. §1821), whereas in practice it also acts as a receiver for all FDIC-insured state banks (Carnell et al., 2008). The resolution of a bank can be done using four different methods: (i) liquidate all assets; (ii) pay a third party to reimburse depositors; (iii) get an acquirer to purchase some/all assets and to assume some/all

[10] See e.g. http://www.federalreserve.gov/oig/the%20Capital%20Purchase%20Program.htm

[11] The sum of the total assets of the 6900 commercial banks included in the analysis is around US$2'833bn, almost fourteen times the total CPP investments. This is a very conservative estimate of the size of the banking industry because our sample does not include the largest banks.

liabilities (Purchase and Assumption); (iv) set-up a bridge bank that include some/all assets and liabilities and continues to conduct business until an acquirer is found (12 U.S.C. §1821).

Nowadays, the FDIC favors the Purchase and Assumption (P&A) method. P&A transactions often include a loss sharing agreement, under which the FDIC absorbs a portion of the loss on a given set of assets, in principle on an 80% FDIC - 20% acquirer basis. The approach is deemed to make resolution operationally simpler while permitting to postpone the sale of individual assets until market conditions are favorable.[12]

502 financial institutions were subject to FDIC receivership from 2008 to September 2013.[13] This number is more than ten times of what it was during the expansion period that preceded (40 banks failed between October 2000 and September 15, 2008) and clearly above the 4.5 yearly average prototypical of the 1995-2007 period (Cowan and Salotti, 2015). On the other hand, having 140 banks subject to FDIC resolution in 2009, followed by an additional 157 banks in 2010 is comparable to the 162 yearly FDIC receivership average experienced in the wake of the savings and loans crisis (Bennett and Unal, 2015).

Overall, however, these bailout and failure numbers should not obfuscate the fact that the vast majority of US banks managed the credit crisis without governmental assistance. Given our focus on smaller commercial banks, it is likely that their supervisory authority generally required the taking of prompt corrective actions as soon as a given bank became undercapitalized,[14] including the

[12] More than 300 shared-loss agreements had been entered into by September 30, 2013, allowing for estimated savings of $41 billion compared to outright cash sales of assets: http://www.fdic.gov/bank/individual/failed/lossshare/.

[13] http://www2.fdic.gov/hsob/HSOBSummaryRpt.asp?BegYear=2008&EndYear=2013&State=1&Header=0. An additional 11 P&A transactions involved insured deposits only.

[14] Under the Federal Deposit Insurance Act, Section 38, banks are deemed undercapitalized when their leverage ratio falls below 4% and/or their total risk-based capital ratio falls below 6%.

submission of a capital restoration plan within 45 days (12 U.S.C. §1831o). It is only when these actions proved insufficient that failure, i.e. receivership, did follow.[15]

3. Data & Descriptive analysis

3.1 Data

For the reasons mentioned in the introduction and following DeYoung and Torna (2013), we focus on commercial banks, rather than their parent bank or financial holding companies. We start from the list of failed banks whose primary federal regulator was the FDIC. This list, available on the FDIC website,[16] covers the period from Oct. 2000 to Sep. 2013. Accounting data used throughout the study are obtained from *Consolidated Reports of Condition and Income (Call Reports)*.[17]

Data for CPP recipients and CPP transactions are from the US Treasury's website.[18] When CPP funding is made at the bank holding company level (which is the rule), we consider the commercial bank affiliated to the BHC as a CPP recipient. As already mentioned, this takes into account the fact that, due to BHCs usually being under the control of their largest bank (Carnell et al., 2008), BHC affiliated commercial banks were the most likely users of CPP funding. Using this

[15] In theory, the supervisory authority could place the bank in conservatorship (to correct problems at a viable bank) rather than in receivership (to resolve a failed bank by liquidating assets). However, conservatorship is the exception: from 1934 to 2005, 2094 FDIC-insured institutions were placed in receivership and only 2 in conservatorship (Carnell et al., 2008 at 706).

[16] https://www.fdic.gov/bank/individual/failed/banklist.html and https://www2.fdic.gov/hsob/SelectRpt.asp?EntryTyp=30&Header=1.

[17] Call reports data for commercial banks are available from the Federal Reserve Bank of Chicago's website (http://www.chicagofed.org/webpages/banking/financial_institution_reports/commercial_bank_data.cfm) and starting March 2011 from https://cdr.ffiec.gov/public/ .

[18] http://www.treasury.gov/initiatives/financial-stability/TARP-Programs/bank-investment-programs/cap/Pages/cpp-results.aspx?Program=Capital+Purchase+Program (CPP Recipients and CPP Transactions).

approach, we identify 826 commercial bank as CPP recipients, of which 53 were commercial banks that received funds directly from the US Treasury.

Table 1 reports the number of failed banks in the FDIC list from September 30, 2008 to September 30, 2013, as well as the number of banks the FDIC included in its *problem list*.[19] We report in the column *Commercial Banks* the number of failed banks that actually have Call Reports data available.[20] As already noticed by Cole and White (2012) and DeYoung and Torna (2013), commercial bank failures significantly increased in the immediate aftermath of the financial crisis (2009-2010). However, a substantial number of failures also took place in 2011 and 2012, a period during which the US economy was already recovering. The column *Surviving Filters* reports the number of failed commercial banks included in our final sample. Like in DeYoung and Torna (2013), banks have to survive the following screens to be included: (i) the commercial bank or its bank holding company has less than $100bn of total assets (because the probability of failure for a too-big-to-fail bank does not depend on its financial performance, and their participation in the CPP was almost compulsory); (ii) the ratio between deposits and total assets is larger than zero; (iii) the ratio between total gross loans and total assets is above (or equal) to 0.25; (iv) the bank is not controlled by a majority foreign owner (which would have prevented it from getting CPP funding); (v) the age of the bank is at least 3 years. This requirement is to mitigate the problem of the so-called *de novo banks* that have been recently established. DeYoung (2003) finds that these banks are financially fragile and they face an increasing likelihood of failure during the initial period. Finally, we require that the bank be classified as domestic and located in one of the 50 states (plus District of Columbia).

[19] The names of the banks included in the problem bank list are not publicly available. The number of banks in the list is published every quarter in the Quarterly Banking Profile available at: https://www2.fdic.gov/qbp/index.asp.

[20] The majority of the failed banks without Call Reports data are savings banks.

As of September 30, 2008, 6900 US banks survive the five filters, of which 382 failed over the next five years. Bank failures are relatively more frequent in states like Georgia, Florida, and Arizona. Appendix A provides the breakdown of failures and CPP investments by state level.

[Insert Table 1 about here]

Table 2 presents descriptive statistics for the universe of 6900 commercial banks available in the Call reports data for the quarter ending on September 30, 2008. All non-binary variables are winsorized at 1% on both tails. Variables are described in Appendix B.

Commercial banks affiliated to a listed bank represent less than 10% of the sample, which stresses the importance of extending the analysis to non-listed banks (see Bayazitova and Shivdasani, 2011; Duchin and Sosyura, 2012). The median bank has *total assets* of less than $150 million, again signaling that small banks represent an important component of the US banking system. Studying the 1984-2004 period, Ashcraft (2008) documents evidence that multi-bank holding company subsidiary banks are less likely to fail and more likely to receive capital injections from parent companies when faced with financial distress. In our sample, one out of five banks is affiliated with a BHC with more than one depository institution (*multibank* dummy).

Operating performance (ROA) is negligible, and *return on equity* (ROE) is less than 5%. On average, the *equity ratio* is above 10%, which suggests that, at least on paper, US banks were relatively well capitalized at the beginning of the crisis. This conjecture is also supported by a *tier 1 ratio* larger than 14%. Descriptive statistics for the other variables used in the empirical analysis show values that are in line with existing bank failure literature (Cole and White, 2012; DeYoung and Torna, 2013). In particular, the 48% real estate loans to total assets ratio is remarkably similar to the 53% ratio reported by Huizinga and Laeven (2012) for the average bank holding company.

Finally, we use two proxies to capture political connections. The first proxy is a lobbying indicator (*Lobbying Dummy*) that takes value 1 if the bank *i* lobbied in 2007-08. We obtain information on lobbying expenditures from the opensecrets.org - Center for Responsive Politics

(CRP). The data is compiled using quarterly lobbying disclosure reports filed with the Secretary of the Senate's Office of Public Records. We find that about 1% of the banks in our sample lobbied national politicians before the financial crisis. This percentage is apparently smaller than the ones in Duchin and Sosyura (2012) (6.8%) and Blau et al. (2013) (4.73%), which however use US listed banks as a sample. Given that large and listed banks obtain greater benefits from lobbying a national politician than small local banks, our lower percentage of lobbying banks is an expected result. Following Duchin and Sosyura (2012), we also employ the *House FS Subcommittee* indicator. This binary variable is equal to 1 if the House member representing the voting district of a firm's headquarters served on the Capital Markets Subcommittee or the Financial Institutions Subcommittee of the House Financial Services Committee in 2008 or 2009. We find that 13.51% of the banks in our sample are politically connected using this definition.

[Insert Table 2 about here]

3.2 Descriptive Analysis

Table 3 shows descriptive statistics for CPP banks and FDIC resolved banks. Panel A of Table 3 compares the number of failed banks and the number of commercial banks affiliated with a BHC that received CPP funding.

Overall, 382 out of 6900 commercial banks failed (5.5 percent). Moreover, Panel A clearly shows that there is almost no overlapping between CPP and commercial bank failures: only 19 banks that received CPP funds had failed by the end of 2013 (2.3 percent of the CPP banks). This means that CPP funding and FDIC resolution are close to being mutually exclusive events.

[Insert Table 3 about here]

Panel B of Table 3 reports information concerning bank failures and CPP funding by bank size (measured by the bank's total assets). The largest banks received more than half of the CPP funds,

whereas small banks (less than 500 million USD in total assets) received less than 23% of the total CPP allocation. By contrast, more than 70% of the failures involve small banks.

Panel C of Table 3 shows that, as expected, CPP banks are more politically connected than non-CPP banks. Failed banks tend to lobby less than non-failed banks, but they are more likely to be headquartered in the district of a House member that serves on the financial services subcommittees.

Finally, Panel D of Table 3 provides descriptive statistics for four subgroups: (i) banks that did not receive CPP money and did not fail until 30 September 2013 (*No CPP & No Failure*, 5760); (ii) banks that received CPP money (*CPP*, 813); (iii) banks that failed by the end of 2013 (*Failed*, 363); and (iv) banks that received CPP money and failed (*CPP & Failed*, 19). The results of the tests comparing CPP and failed banks (we ignore the CPP & Failed group given the limited size) point toward CPP banks being *on average* more viable than failed banks at the end of the last quarter before TARP. CPP banks were larger and older; more capitalized, even if only marginally so; had less cash; and relied less on brokered deposits—which have been associated with rapid and risky growth (Cole and White, 2012). CPP banks also had less troubled loans. While they lobbied more, CPP banks did not have stronger political connections than failed banks according to the House Financial Services subcommittee indicator.

However, our evidence does not suggest that CPP banks were in better financial shape than No-CPP/No Failure banks. This contrasts with Ng et al. (2011), who report that CPP banks had stronger fundamentals compared to No-CPP banks both prior to and during the program's initiation period. At the commercial bank level, our data points to CPP banks being in worse shape than No CPP/No Failure banks, even if not in as bad conditions as the No-CPP/Failed banks.

4. Econometric Analysis

4.1 Predicting bank failure

Were bank failures (and bailout situations) foreseeable when the crisis started and, if yes, did the Treasury bail-out only those commercial banks that were both viable and in temporary distress? In order to answer these questions we first estimate a Probit model with FDIC resolution and CPP as the dependent variables. Table 4 serves the purpose of verifying whether it was possible to forecast which banks were likely to fail and which ones were likely to receive cash injections from the Treasury.

[Insert Table 4 about here]

Panel A presents results of probit model regressions where the dependent variables are: *failure* dummies (columns I and III); and *CPP participation* (Column II and IV). These results are based on data for the quarter ending on September 30, 2008 data. Consistent with the univariate analysis, we find that *brokered deposits, credit risk*, low *equity* ratios, *goodwill*, non-performing loans (*NPL*), weak profitability (measured as *ROA*[21]), and real estate (*RE*) *loans* increase the likelihood to fail. In particular, the positive coefficient for *goodwill* is consistent with the interpretation that it represents overpayment in acquisitions (Cole and White, 2012). Columns I and IV also show that commercial banks affiliated to *listed* and/or *multibank* holding companies are less likely to fail. Similarly, banks that lobby are less likely to fail. Looking at Columns II and IV, there are significant differences in the determinants of bailouts. *Size* positively affects the likelihood to receive a bailout, as well as commercial and industrial (*C & I*) *loans*. Being affiliated to a *listed* and/or *multibank* holding also has a positive impact on the probability to receive a bailout. Profitability is no longer significant. *Non-performing loans* and *age* affect the likelihood of a bailout negatively. Finally, lobbying increases the probability of a bailout, which is consistent with Duchin and Sosyura (2012) and Blau et al. (2013).

[21] We obtain similar results if we include ROE instead of ROA in the regression models. ROA and ROE cannot be included in the same model for collinearity reasons.

It follows from Panel A that it is reasonable to assume that it was possible to predict at the outset of the crisis whether a bank would be bailed out as well as whether it was likely to fail. What remains to be shown is whether the (conservative) viability criteria used by the Treasury were fully adequate or whether another approach would have been preferable—an issue we will return to in Section 4.3.

In Panel B, we rerun the same models using end of 2006 data, which were available before the beginning of the crisis. In particular return on assets (*ROA*), *loans*, *credit risk* and *equity* indicators suggest that the characteristics leading to eventual bank failures were both systematic and possible to identify *ex ante*, well before the crisis. In other words, a given bank's problems were not hidden; they were in the spotlight and thus could have been detected by supervisory authorities and the Treasury. This conclusion is supported by the fact that only 19 of the banks that received CPP funds had failed by September 2013.[22]

4.2 The competitive impact of CPP funding

In this section, we try to validate whether CPP funding provided a competitive advantage to CPP banks over non-CPP banks. To that end we undertake a three-step analysis. Using a bank matching approach, we compare CPP banks to non-CPP banks, then to those non-CPP banks that did not fail and finally to banks that were subject to FDIC resolution.

Table 5 reports the estimates of means and medians abnormal variables for CPP banks for quarters ending between December 31, 2008 (one quarter ahead) and September 30, 2011 (twelve quarters ahead). Quarter 0 is the quarter ending on September 30, 2008. Abnormal variables are

[22] These 19 banks did not seem to have special characteristics: they did neither lobby nor have larger-than-average political connections; and they were not concentrated in a single region, being located in California (4), Illinois (4), Missouri (2), and Florida (2).

measured as the difference between the value of the variable of a CPP bank minus the corresponding performance of a matching non-CPP bank.

Matching banks are selected using a propensity score matching (PSM) approach, which relies on the probit model (II) of Table 4, Panel A, i.e. the model with the lobbying dummy as proxy for political connection.[23] Once we obtain the predicted values from the probit model (scores), the non-CPP bank from the same state (to avoid distortions due to geography) with the score closest to the CPP bank is selected as matching bank. If the matching bank drops out of the sample before September 2011, the second closest is used to replace it. We repeat this algorithm up to the fifth closest bank. Abnormal variables are winsorized at 2.5% on both tails.[24]

[Insert Table 5 about here]

Panel A compares CPP banks and their matching non-CPP banks as of September 30, 2008. Looking at *median* tests, the two groups of banks are not statistically different. While these results confirm the quality of the matching procedure, they also highlight the existence of non-CPP banks with characteristics similar to those that received CPP funds.

Panel B shows that commercial banks that received CPP funds (or were affiliated to a BHC that received CPP funds) have similar performance in terms of ROA than those of matched non-CPP banks. This suggests that CPP funding did not give a competitive edge to their beneficiaries. Here too, these results differ from those reported for BHCs. For example, Berger and Roman (2013) find that CPP recipients had competitive advantages and increased both their market shares and market power. Looking at ROE, there is some evidence that CPP banks outperform non-CPP banks, but again

[23] We repeat the PSM approach using the model with the House FS subcommittee indicator (model II, Panel A Table 4). Results are qualitatively similar and omitted for brevity purposes. They are available from the authors upon request.

[24] We also perform the PSM using a caliper matching. We tried different width for the caliper, obtaining results that are qualitatively similar to those presented in the section. We also use a difference-in-difference matching approach to eliminate the time constant unobserved effects. Again, results are qualitatively similar and omitted for brevity purposes.

only if we look at the mean. In fact, median abnormal ROE is never significant. Overall, ROA and ROE results suggest similarity in the profitability of CPP and non-CPP bank assets and equity.

On the other hand, CPP banks have more solid Equity/Total Assets ratios than matched firms starting from the second quarters. This state of affairs is associated with the actual reception of CPP funds, which increased the capital ratios of the receiving banks. CPP banks continued to enjoy higher capital ratios up to the twelfth quarter after September 2008 (September 2011). Conversely, CPP banks originally lent less than matching non-CPP banks. However, starting from quarter 6, there are no statistically significant differences in terms of total loans, suggesting that CPP banks were under pressure to increase loans. This finding is consistent with a report by the Office of the *Special Inspector General for the Troubled Asset Relief Program* (SIGTARP) according to which several banks did not increase lending as a result of TARP (SIGTARP 2009).[25] CPP banks also tended to be less risky in terms of credit risk, but this result is generally not significant.

While Panel B does not highlight significant performance differences between CPP banks and matching banks that did not receive government money, the *resolution* importance of government funding is made clear by Panel C. It shows that over the five years that followed CPP funding, merely 19 (2.3%) out of 826 CPP banks were subject to FDIC resolution, whereas this was the case for 110 (13.32%) of the matching 826 non-CPP banks. In other words, our data points to non-CPP banks being almost six times more likely to be subject to FDIC resolution than their matching CPP banks.

We perform a similar analysis in Table 6, but this time the matching bank is selected from the pool of non-CPP banks that survived until the end of our sample period.[26] Table 6 shows that the quality of the matching significantly deteriorates, with more accentuated key differences between CPP banks and their matches. This finding provides additional evidence of CPP funding being

[25] This finding is also supported by the results of Duchin and Sosyura (2014), who find that bailed-out banks do not make more loans but instead make riskier loans while looking safer at capital ratios.
[26] All the other criteria and requirements stays the same.

essential for bank survival. Matching deterioration implies that, for a number of CPP banks, the original matching bank was a bank that failed after the beginning of the CPP program. Moreover, the substantial underperformance of CPP banks with respect to the new matching banks implies that CPP banks were in bad shape at the outset of the crisis. In other words, Table 6 points to CPP funding being crucial for the survival of a number of CPP banks.

These results are further corroborated by Table 7, which presents the results of a Cox proportional hazards model. Here, the key variables of interest are the binary variables for *CPP funding* and *CPP repayment*. The sample period includes quarters ending between December 31, 2008, and December 31, 2009 (five quarters) in Columns I and II; between December 31, 2008, and December 31, 2010 (nine quarters) in Columns III and IV; and between December 31, 2008, and September 30, 2013 (twenty quarters) in Columns III and IV. In line with our previous findings, Table 7 shows that CPP funding substantially decreases the likelihood of a bank being subject to FDIC resolution. CPP repayment lowers to probability or failure going forward, but only in Column II and IV. This indicates that markets considered CPP repayment as a signal that the bank was in good financial health—but only if the bank was able to repay the Treasury quickly.

[Insert Tables 6 and 7 about here]

In short, while CPP funding may not have been the only reason why non-CPP banks were almost six times more likely to fail than matching CPP banks (Table 7 shows that lobbying also decreases the likelihood of failure), our findings clearly suggest that the Treasury may have been overly restrictive in selecting CPP banks.

To clarify whether the Treasury did in fact fail to bail-out some viable banks, we match each bank subject to FDIC resolution to the CPP bank with the most similar characteristics at the time of CPP funding. This test has the following goals. First, we verify if at the beginning of the crisis the soon-to-be failed banks were as a group comparable to the CPP banks that were rescued. Second, we use the 2009-2011 performance matching CPP banks as a proxy for the performance of failed banks

would they have received CPP funds. If the CPP bank *performs better*, it signals that the cash injection would have increased the probability to survive of the matched failed bank—meaning, in turn, that the Treasury adopted a very restrictive approach in allocating CPP funding, which resulted in the exclusion of small banks that may have survived with Treasury support.

Table 8 reports the estimates of means and medians abnormal performance for failed banks for quarters ending between December 31, 2008 and September 30, 2011 (twelve quarters). As in Tables 5 and 6, quarter 0 is the quarter ending on September 30, 2008. Our abnormal variables are measured as the difference between the variable value for the failed bank and the corresponding variable value for the matching CPP bank. Here too, matching banks are selected using a propensity score matching (PSM) approach, which relies on the probit model (I) of Table 4. Once we obtain the predicted values from the probit model (scores), the CPP bank headquartered in the same state of the failed bank with the propensity score closest to the failed bank is selected as matching bank. If - for any reason not related to resolution - the matching bank drops out of the sample, the second closest is used as matching bank. As we did for the matching approach in Tables 5 and 6, we repeat this algorithm up to the fifth closest bank. Abnormal variables are winsorized at 2.5% on both tails.

Panel A compares failed banks and CPP banks as of September 30, 2008. The propensity score matching highlights the differences between the two groups of banks, which do not disappear along four of the dimensions considered (profitability of equity, loans, equity ratio, and credit risk) even when we select the closest match. This suggests that matched failed banks, *as a group,* were remarkably *different* from CPP banks.[27] It also suggests that ROA, ROE, loans, equity, and credit risk probably were among the criteria the Treasury used to allocate or deny CPP funding.

[Insert Table 8 about here]

[27] In an untabulated analysis, we compare failed banks with non-CPP banks that survived. Differences are larger than those reported in Table 8.

In Panel B, *abnormal performance* (both ROA and ROE) is negative and significant in almost all quarters. It has to be noted that several small banks received CPP funding in the spring of 2009 (3 quarters ahead), which can explain why the performance differential is more negative after this quarter. Abnormal ROE results are stronger than ROA ones. Taking into account that matched banks are also similar in terms of managerial quality, this points towards matching CPP banks having been able to take more business risks than their failed counterpart. *Loans* issued by failed banks and matched CPP banks are significantly different in the first six quarters, with failed banks issuing less loans than CPP banks. *Equity* ratios are also worse for failed banks than for CPP banks, consistent with the fact that the cash injection helped stabilize these banks. Finally, *credit risk* is usually lower for failed banks.

Overall, Table 8 shows that failed banks and matching CPP banks performed very *differently*. Using the performance of the closest CPP bank as a proxy for the performance of the failed bank, we find a significant improvement in operating performance, capital ratios, and asset quality following the injection of CPP funding. These results do not allow us to say with certainty how many failed banks could have been saved if they had received CPP funding. However, there are strong indications that the Treasury adopted a very restrictive approach in allocating CPP funding, which resulted in the exclusion of small banks that could have survived with Treasury support but failed in its absence. Whether or not this made sense from a policy perspective is an issue we will address in Section 5.

4.3 The impact of TAF & TGLP funding

Starting December 12, 2007, the Federal Reserve established the *Term Auction Facility* (TAF) to meet financial institutions' demand for term funding.[28] Under the program, the Federal Reserve auctioned 28-day loans, and, beginning in August 2008, 84-day loans, to depository institutions in

[28] Initially, the FED tried to increase the amount of liquidity available to financial institutions through the discount window. However, many banks were reluctant to borrow at the discount window out of fear that their borrowing would become known and would be erroneously taken as a sign of financial weakness.

generally sound financial condition. The loans were fully collateralized. All depository institutions eligible to borrow under the Federal Reserve's primary credit program were eligible to participate in TAF.[29] The final TAF auction was held on March 8, 2010, with loan reimbursements expected on April 8, 2010. All loans were repaid in full, with interest, in accordance with the terms of the facility.

Since banks facing liquidity problems could have used TAF either as a complement or as an alternative to CPP funding, we investigate whether our results are affected by this contemporaneous program. TAF data is available on the Federal Reserve's website.[30] Table 9 shows that TAF was actually used by banks in sound financial conditions. In fact, only 17 out of 244 participants (about 7%) in the TAF program went bankrupt between Sept. 2008 and Sept. 2013 and less than 0.50% of the auctioned loans went to banks that failed.

It is noteworthy that 45% of TAF users were CPP banks and almost 90% of the loan volume made via TAF went to CPP banks. Panel C also shows that CPP banks were more likely (12.6% vs. 8.60%) to receive TAF funding than the matched non-CPP counterparts identified in Section 4.2. Only three banks that received both CPP and TAF failed.

[Insert Table 9 about here]

We also investigate the role of the *Temporary Liquidity Guarantee Program* (TLGP), implemented by the FDIC on October 14, 2008, as part of a coordinated response by the U.S. government to calm markets and encouraging lending during the crisis period. Using data available on the FDIC website,[31] we find that 132 sample banks used TLGP. The majority of the TLGP users were CPP banks (about 64%), which also accounted for more than 95% of the amount guaranteed with the program.

[29] U.S. branches and agencies of foreign banks were eligible to borrow under TAF.

[30] http://www.federalreserve.gov/newsevents/reform_taf.htm

[31] https://www.fdic.gov/regulations/resources/TLGP/total_debt.html

Overall, these results indicate that TAF and TLGP were used as complements rather than substitutes to CPP funding. Moreover, this additional source of liquidity was not available to banks that later faced FDIC resolution, confirming our previous conclusion that the Treasury effectively screened out the worst banks.

5. Would it have been optimal to rescue (some) failed banks?

In this section we investigate the cost of letting the 382 banks in our sample fail during the period September 2008 to September 2013. While the FDIC is mostly funded by premiums that banks and thrift institutions pay for deposit insurance coverage, government intervention may become necessary to save deposit insurance corporations during severe crises.[32] The credit crisis caused a severe drainage of the deposit insurance fund, which shrunk from $52.8 billion at the end of March 2008 to only $10.4 billion in August 2009. Moreover, the *Federal Deposit Insurance Corporation Improvement Act* (FDICIA) of 1991 gave FDIC the ability to borrow from the Treasury. To calm the public when large losses were announced in the second quarter of 2009, Chairman Sheila Bair remarked that FDIC had the ability to borrow up to $500 billion from the Treasury. She also added that a "*decline in the fund balance does not diminish our ability to protect insured depositors*," implicitly suggesting government guarantees.[33] For these reasons, we believe that the bank failure costs borne by the FDIC should be included when calculating the costs and benefits of the Treasury's bailout decisions.

Our goal is to determine whether the Treasury took a prudent decision not to provide CPP funds to hundreds of banks, either by denying their applications or by discouraging them from

[32] For example, the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) authorized the use of taxpayer money to resolve S&L failures.

[33] FDIC-Insured Institutions Lost $3.7 Billion in the Second Quarter of 2009, Press Release PR-153-2009, FDIC. http://www.fdic.gov/news/news/press/2009/pr09153.html (last accessed on April 23, 2014)

applying. To do so, we need to estimate the *expected cost of the failure* and the *expected cost of bailing-out* a bank. By comparing these two costs, we can classify the Treasury decision as incorrect if the expected cost of failure is larger than the expected cost of bailing out the bank. Formally:

$$Expected\ Cost\ of\ Failure \geq Expected\ of\ Cost\ of\ Bailout \quad (1)$$

which can be written as:

$$p_F * Cost\ of\ Failure_{NR} \geq p_{FR}(Cost\ of\ Bailout + Cost\ of\ Failure_R) \quad (2)$$

where p_F is the probability to fail without government intervention; *Cost of Failure*$_{R(NR)}$ is the estimated cost of resolution at the time of the rescue decision *with (or without)* government assistance; p_{FR} is the probability of failure given government intervention; and *Cost of Bailout* is the estimated cost of funding the bank. Moreover, while the cost of failure without government intervention (*Cost of Failure*$_{NR}$) is likely to be larger than the cost of failure post bailout (*Cost of Failure*$_R$), we make the conservative assumption that the two values are equal. Given the uncertainty surrounding the success of the CPP in October 2008, we also consider a worst-case scenario approach in which we assume funding costs to be entirely sunk, an assumption that plays in favor of the Treasury decision to leave the banks fail. In this scenario equation (2) becomes:

$$p_F * Cost\ of\ Failure_{NR} \geq Cost\ of\ Bailout + p_{FR} * Cost\ of\ Failure_R \quad (3)$$

We use the *Estimated Loss* provided by FDIC as a proxy for the *Cost of Failure*. FDIC defines the estimated loss as "the difference between the amount disbursed from the Deposit Insurance Fund (DIF) to cover obligations to insured depositors and the amount estimated to be ultimately recovered from the liquidation of the receivership estate. Estimated losses reflect unpaid principal amounts deemed unrecoverable and do not reflect interest that may be due on the DIF's administrative or subrogated claims should its principal be repaid in full." *Estimated Loss* thus refers to the expected costs for the FDIC, not the difference between assets book value at the time of bank closure and assets

value in a Purchase and Assumption transaction (see also James, 1991). Values for estimated losses are available for 367 of the 382 failures.[34]

The *Cost of Bailout* is estimated as a percentage of the bank's risk-weighted assets: 3% if the bank's total assets are above $500 million, 5% if they are below $500 million. The rationale for this proxy stems from the fact that the government intervention was capped to 3% of the risk-weighted assets of the applying banks, a cap that was raised to 5% in the third CPP window in May 2009 for small banks (i.e. banks with less than $500 million in assets).

Our proxy for p_F is the *estimated probability of failure* obtained from model I in Table 4, panel A. Finally, the *probability of failure given government intervention* p_{FR} is equal to p_F minus the reduction induced by the government's cash injection. We estimate the upper bound of this unobserved reduction using the realized frequency of resolutions for CPP banks and their matching banks reported in Panel D of Table 5. Using the model with the lobbying indicator,[35] the frequency of resolutions for non-CPP banks is 13.32%, while the frequency in the CPP sample is just 2.30%. So, the provision of CPP funds implies, on average, a decrease in the frequency of resolutions of 82.73% (= (13.32% - 2.30%) / 13.32%)). Denoting this decrease by π, our proxy for p_{FR} is the following:

$$p_{FR} = (1 - \pi) * p_F \qquad (4)$$

To put it differently, the ratio between p_F and p_{FR} equal to 5.79, i.e. the probability to fail without a government bailout is almost six times higher than with CPP funding. However, since the reduction obtained from the frequencies in Table 5 appears quite large, we also take a more

[34] Since the estimated loss does not materialize on the day of the decision but in a future date, we should discount it. However, we ignore discounting in this situation to use a more conservative estimate of this value. Ignoring discounting does not affect our results.

[35] The results are remarkably similar if we use the model with House financial service subcommittee indicator.

conservative view and compute estimates of p_{FR} assuming that π is equal to 50% and 66.67%. These values for π imply a ratio p_F/p_{FR} equal to 2 and 3, respectively.

Panel A of Table 10 reports descriptive statistics for key inputs of our analysis. The average *estimated loss* is around \$130m per failed bank, which is slightly less than 20% of the bank's *total assets* at the end of the third quarter of 2008.[36] The grand total of the estimated losses is \$47.8bn, almost one-fifth of the money injected in the system via CPP. Average *risk-weighted assets* are about \$460 million. The average *probability of failure* is about 42%, which further confirms the good fit of our model.

[Insert Table 10 about here]

Panel B Table 10 reports means and medians for the *expected cost of failure*, the *expected cost of bailout*, and their *difference* using the model of Equation (2) in both the delay and no delay scenarios. The table offers a clear picture: the expected cost of saving these banks is small compared to the expected cost incurred by FDIC because of their resolution. Indeed, we find that almost all 367 failed banks *should* have been saved. The aggregate expected cost of saving these banks varies from a relatively small \$4.3 billion to 12.6 billion, while the expected cost of their failure is \$22.1 billion. Thus, providing CPP funds to these banks would have hypothetically saved the FDIC (and thus the US taxpayer), from \$9.5 to \$17.8 billion.

The second part of Panel B shows the same statistics but assuming that the Treasury cannot recover the bailout money, a very conservative assumptions that play in favor of the Treasury's decision. Again, the expected cost of saving these banks is small compared to the expected cost incurred by FDIC because of their resolution. Indeed, even using this extremely conservative

[36] These numbers are consistent with Bennett and Unal (2015) who estimate the total resolution costs in 22.96% of the total asset value in the quarter before failure (post FDICIA 1991). Total resolution costs are slightly larger than the estimated loss because they include also the losses for claimants other than the FDIC.

approach, we find that, in our exercise, it would have been preferable to extend CPP funds to between 187 and 227 out of the 367 failed banks (51 to 62%). The aggregate expected cost of saving these banks increases with respect to the previous scenarios as expected, but providing them with CPP funds would have saved the FDIC (and thus the US taxpayer) a substantial amount of money, with savings ranging from $3.8 billion to $11.1 billion.

However, there is substantial evidence that FDIC resolution interventions were delayed (see, for example, Liu and Ngo, 2014). This does not come as a surprise, supervisory and resolution authorities having strong incentives to avoid or, at least, delay receivership. In particular, it is well known that supervisory authorities generally arrange for failing banks to be taken over by a competitor to avoid shortsightedness and forbearance criticism (Enriques and Hertig 2015). Resolution authorities, for their part, prototypically adopt a wait and see approach. In non-crisis time, they want to give takeover undertakings a chance. In the presence of a financial crisis, they do not want to intervene before having a good understanding of the nature, scope and potential impact of the bailout packages monetary and fiscal authorities usually adopt in such circumstances.

It follows that our estimated *Cost of Failure* may be higher than it would have been in the absence of resolution delays.[37] This should have no impact on our cost of resolution/cost of bailouts comparison if intervention delays symmetrically affect bailout costs. Moreover, even if we assume that (i) this is not the case and (ii) future resolution interventions will be more timely, it would remain cost efficient to bailout more commercial banks than during the credit crisis. To demonstrate this, we first determine *ex post* a potential date for resolution without delay in the credit crisis environment. This moment is determined exploiting data on supervisory actions hand-collected from the FDIC

[37] Note that this is also true for industrial firms: Andrade and Kaplan (1998) provide evidence of most revenues, opportunities and goodwill losses due to financial distress occurring pre-bankruptcy filing.

ED&O database, the Office of the Comptroller of the Currency (OCC) Formal Enforcement Actions search engine, and the Federal Reserve's Enforcement Actions search engine.

Similarly to DeYoung and Torna (2013), we identify the timing of the following enforcement actions*: consent order*; *order to cease & desist*; *prompt corrective action* directive; *written or formal agreement*; *order for restitution*. We then use the first enforcement action against the failed bank posterior to September 2008 (or the non-completed action started before Sep. 2008) as the reference point for the date in which the bank should have been seized by FDIC. The delay is computed as the number of quarters between the quarter before the enforcement action and the last quarter before the failure. Overall, we find that 295 out of the 382 failed banks received at least one enforcement action before their failure (77.22%), with the average (median) delay being 3.78 (3) quarters. These delays were indeed costly: on average, the failed banks total assets decreased by about 13% ($76 million).[38]

To account for these delays in our estimation of the cost of failure, we subtract this decrease in total assets from the estimated loss.[39] Then, we multiply this adjusted cost of failure by the probability of failure of obtaining it, which is reported in Panel C of Table 11 (*No Delay*). We also re-estimate the expected cost of bailout to account for (i) differences in the value of risk-weighted assets between the time of the first enforcement action and the failure date; (ii) the revised cost of failure.[40] We find that the average *expected cost of failure* decreases by about one third (to $40 million on average) in a no resolution delay situation. However, the intervention lowers the expected costs of bailout compared to the those in Panel B. Thus, even these new estimates remain above the *cost of*

[38] It is worth remembering that a decrease of 13% in total assets is more than enough to wipe out completely the equity of the great majority of banks.

[39] If there is an increase in total assets, we set the decrease equal to zero.

[40] We also rerun the test assuming that the expected cost of bailout remained the same as in the "delay" scenario. Using this higher expected cost of bailout decreases the savings from bailing out failed banks to 3.5bn and the number of banks worth saving to 146, but it does not alter our main conclusions.

saving the bank.[41] The *total expected cost of failure* is still a hefty $14.5 billion, and the potential savings varies from $370 million (assuming CPP funding unrecoverable) to $11.5 billion (CPP funding recoverable). Even assuming FDIC resolutions without delays, the results of our analysis indicate that it would have been worth bailing out failed banks.

One issue with the analysis above is that we limited it to banks failing within five years. This may underestimate the true cost of a policy aiming at rescuing a larger number of banks, respectively overestimate the benefits of a more generous bailout approach. However, there is significant uncertainty as to the cause of longer term failures of bailed out banks. While it is possible that they are due to pre-bailout business plan or asset quality deficiencies (which would speak for a tougher resolution approach), they may also reflect changes in the post bailout banking environment or, more generally, the state of the economy (which would speak for a more generous bailout approach). Thus, there is no strong case against widening bailout scope, especially if the best alternative—no bail-out for smaller banks—is not a politically realistic option.

To conclude, while the Treasury made good choices in term of the viability of the banks chosen to be included in the CPP program, its bailout policy was overly selective. We have provided some evidence that it would have been less costly to provide additional banks with CPP funding. Taken at face value, our results imply that, to the extent a bailout program is on the table, its aim should be to err on the side of rescuing too many rather than too few banks.

Needless to say, we do not address any general welfare implications of bail-outs in our analysis, which could be increasing the true costs of a bail-out (moral hazard of banks in the future) or increasing the benefits of bailing-out more banks. With respect to the moral hazard argument we would argue that once the policy-makers have already opted for a bail-out, then it is only a question

[41] To apply the more conservative estimate, we leave the cost of failure unchanged in the computation of the expected cost of the bailout (i.e. the cost of failure is still equal to the estimated loss).

of where to draw the line of which banks should be saved or not. Being overly restrictive about whom to grant a bail-out in our opinion only creates incentives for banks to be "systemically important enough" to be bailed out in the future, while being more generous does not create this incentive. On the additional benefit side of bail-outs, Bernanke (1983) shows that non-monetary costs of failing banks adversely affected the macro-economy in the Great Depression by reducing the quality of financial services, by increasing the credit intermediation costs of channeling funds from the ultimate savers/lenders into the hands of good borrowers. So if non-monetary credit intermediation costs are of concern to the Treasury, it could have decreased these costs by giving more banks access to CPP.

6. Conclusions

We investigate the stark increase in the number of FDIC resolutions of commercial banks following the credit crisis and whether it would have been a good policy for the Treasury to adopt a more generous approach under the TARP Capital Purchase Program (CPP).

Our data shows almost no overlap between CPP-funded and FDIC-resolved commercial banks, which is attributable to viable banks being identifiable as early as 2006. Thus, our results suggest that the Treasury made a good job when it came to granting direct public funding. It managed to stave off further bankruptcies while avoiding to fund non-viable banks. Moreover, we could not find evidence that CPP funding provided a competitive advantage for banks that were bailed out.

However, there is also strong evidence that the Treasury could have prevented a significant number of additional commercial banks from failing by granting them CPP funding. This outcome is probably attributable to excessive reliance upon capital ratios and deficient comparison of funding and resolution costs. While CPP funding is direct public money and FDIC resolutions are seemingly bank-funded, there was clear evidence during the Crisis that the taxpayer was at risk to fund the FDIC too. More importantly, these additional bailouts would have been cost-efficient by saving not only resolution costs but also by avoiding an increase in non-monetary credit intermediation costs.).

Taken at face value, our results imply that, to the extent a bailout program is already on the table, the policy should be to err on the side of rescuing *too many* rather than *too few* banks. This approach would substantially reduce resolution costs without affecting banks' risk-taking incentives in a meaningful way: financial crises are both hard to time and not necessarily addressed by way of bailout programs. In other words, the suggested approach should not raise moral hazard concerns.

References

Andrade, G., Kaplan, S.N., 1998. How costly is financial (not-economic) distress? Evidence from highly leveraged transactions that became distressed. J. Financ. 53, 1443-1493.

Ashcraft, A.B., 2008. Are bank holding companies a source of strength to their banking subsidiaries? J. Money Credit Bank. 40, 273-294.

Bayazitova, D., Shivdasani, A., 2012. Assessing TARP. Rev. Financ. Stud. 25, 377-407.

Bebchuk, L.A., 2009. Buying Troubled Assets, Yale J. Regulation 26, 343-358.

Bennett, R.L., Ünal, H., 2015. Understanding Bank Resolution Costs. Financ. Mark. Inst. & Instrum. 24, 349-389.

Berger, A.N., Bouwman, C.H.S., 2013. How does capital affect bank performance during financial crises. J. Financ. Econ. 109, 146-176.

Berger, A.N., Roman, R.A., forthcoming. Did TARP banks get competitive advantages? J. Financ. Quant. Anal.

Berger, A.N., Imbierowicz, B., Rauch, C., forthc. The role of corporate governance in bank failures during the recent financial crisis. J. Money, Credit, and Banking.

Bernanke, B., 1983. Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression. Am. Econ. Rev. 73, 257-276.

Black, L.K., Hazelwood, L.N. 2013. The effect of TARP on bank risk-taking. J. Financ. Stab. 9, 790-803.

Blau, B.M., Brough, T.J., Thomas, D.W., 2013. Corporate lobbying, political connections, and the bailout of banks. J. Bank. Financ. 37, 3007-3017.

Bolzico, J., Mascaro, Y., Granata, P., 2007. Practical guidelines for effective bank resolution. World Bank Policy Research Working Paper No. 4389.

Brown, C.O., Dinç, I.S., 2011. Too many to fail? Evidence of regulatory forbearance in bank failures when the banking sector is weak. Rev. Financ. Stud. 24, 1378-1405.

Caballero, R.J., Simsek, A., 2013. Fire sales in a model of complexity. J. Financ. 68, 2549-2587.

Carnell, R.S., Macey, J.R., Miller, G., 2008. The Law of Banking and Financial Institutions. Aspen Publishers.

Cole, R.A., White, L.J., 2012. Dejà vu all over again: The causes of US commercial bank failures this time around. J. Financ. Services Res. 42, 5–29.

Cornett, M.M., Li, L., Tehranian, H., 2013. The performance of banks around the receipt and repayment of TARP funds: Over-achievers versus under-achievers. J. Bank. Financ.37, 730-746.

Cowan, A.R., Salotti, S., 2015. The resolution of failed banks during the crisis: Acquirer performance and FDIC guarantees, 2008-2011. J. Bank. Financ.54, 222-238.

DeYoung, R., 2003. De novo bank exit. J. Money Credit Bank. 35, 711-728.

DeYoung, R., Torna, G., 2013. Nontraditional banking activities and bank failures during the financial crisis. J. Financ. Intermediation 22, 397-421.

Duchin, R., Sosyura, D., 2012. The politics of government investing. J. Financ. Econ. 106, 24-48.

Duchin, R., Sosyura, D., 2014. Safer ratios, riskier portfolios: Banks' response to government aid. J. Financ. Econ. 113, 1-28.

Enriques, L., Hertig G., 2015. Shadow resolutions as a no-no in a sound banking union, in: Faia et al. (Eds.), Financial Regulation. A Transatlantic Perspective, Cambridge University Press.

Huizinga, H., Laeven, L. 2012. Bank valuation and accounting discretion during a financial crisis. J. Financ. Econ. 106, 614-634.

Ivashina, V., Scharfstein, D., 2010. Bank lending during the financial crisis of 2008. J. Financ. Econ. 97, 319-338.

Jackson, T.H., Skeel, D.A. 2012. Dynamic resolution of large financial institutions. Harv. Bus. Law Rev. 2, 435-460.

James, C., 1991. The losses realized in bank failures. J. Financ. 46, 1223-1242.

Koetter, M., Noth, F., 2015. Bank bailouts and competition. Did TARP distort competition among sound banks, Econ. Inquiry, forthc.
Li, L., 2013. TARP funds distribution and bank loan supply. J. Bank. Financ.37, 4777-4792.
Liu, W.M., Ngo, P.T.H., 2014. Elections, political competition and bank failure. J. Financ. Econ. 112, 251-268.
Mishkin, F.S., 2000. Prudential Supervision: Why is it Important and What are the Issues? NBER Working Paper No. 7926.
Ng, J., Vasvari, F., Wittenberg-Moerman, R., 2011. The Impact of TARP's Capital Purchase Program on the Stock Market Valuation of Participating Banks. Chicago Booth Research Paper No. 10-10.
Philippon, T., Schnabl, P., 2013. Efficient recapitalization. J. Financ. 68, 1-42.
Scott, K.E, 2012. A Guide to the resolution of failed financial institutions - Dodd-Frank II and proposed chapter 14, in: Scott, K.E., Taylor, J.B. (Eds), Bankruptcy not bail-out, A special chapter 14, Hoover Institution Press.
SIGTARP - Special Inspector General for the Troubled Asset Relief Program, Emergency capital injections provided to support the viability of Bank of America, other major banks, and the U.S. financial system, 2009 SIGTARP Report 10-001, available at www.sigtarp.gov.
SIGTARP - Special Inspector General for the Troubled Asset Relief Program, TARP and SBLF: Impact On Community Banks, 2012 SIGTARP Quarterly Report to Congress, April 25, available at www.sigtarp.gov.
Vallascas, F., Hagendorff, J., 2013. The risk sensitivity of capital requirements: Evidence from an international sample of large banks. Rev. Financ. 17, 1947-1988.
Wilson, L., 2013. TARP's deadbeat banks. Rev. Quant. Financ. Account. 41, 651-674.

Figure 1 – Failing Banks 2004-2013

The figure presents the time series of US commercial bank failures between 2004 and 2013. Data are from the FDIC website (https://www.fdic.gov/bank/individual/failed/banklist.html).

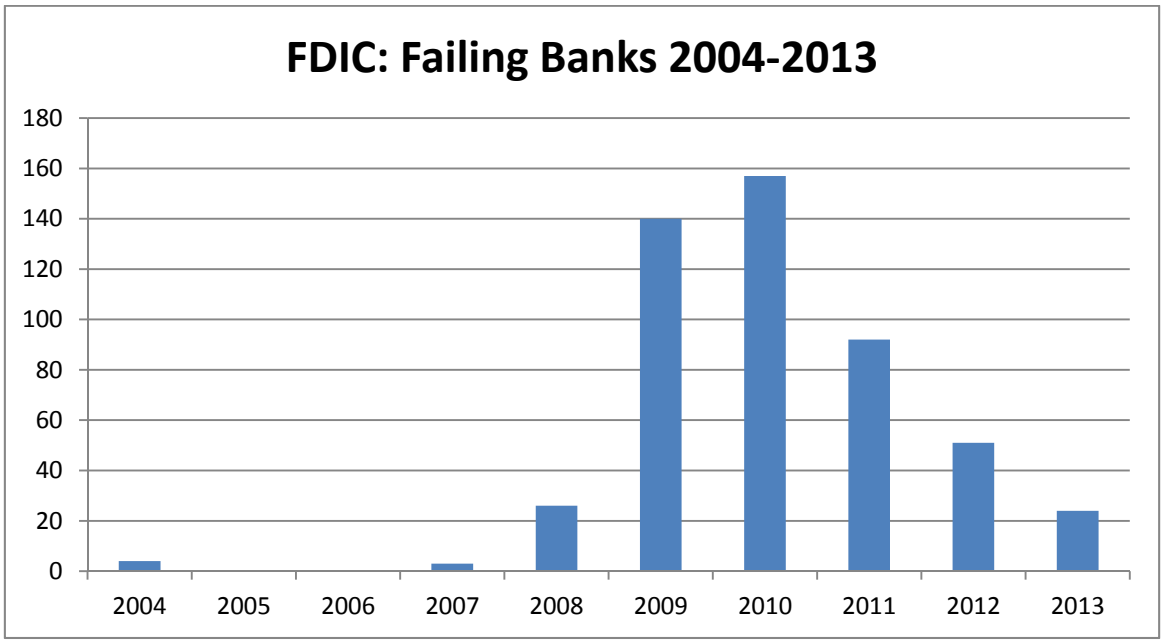

Table 1 – Sample of Failures after September 30, 2008

The table reports commercial bank failures by year (Panel A) and by quarter (Panel B) that took place in the US between September 30, 2008 and September 30, 2013. Column "FDIC Failure List" presents the number of failed banks in every year (quarter) according to the list of failed banks available on the FDIC website. The Column "Commercial Banks" identifies how many of these failed banks have Call reports data available. Finally, the column "Surviving filters" presents the number of commercial banks that survived the following screens: 1) the commercial bank or its bank holding company has less than $100bn of total assets; 2) the ratio between deposits and total assets is larger than zero; 3) the ratio between total gross loans and total assets is above (or equal) to 0.25; 4) the bank is not controlled by a majority foreign owner; 5) the age of the bank is at least 3 years. In Panel B, the column "Problem List" reports the number of banks in the Problem list, a list created and maintained by the Federal Deposit Insurance Corporation which lists banks that are in jeopardy of failing.

Panel A: Failures by year

Year	FDIC Failure List	Commercial Banks	Surviving Filters	Problem List
2008 (Q4)	17	13	8	252
2009	148	126	117	702
2010	154	136	125	844
2011	92	86	77	813
2012	51	42	41	651
2013 (Q1-Q3)	20	19	14	515
Total	482	422	382	

Panel B: Failures by Quarter

Quarter	FDIC failure list	Commercial Banks	Surviving Filters	Problem List
2008 Q4	17	13	8	252
2009 Q1	29	26	21	305
2009 Q2	24	21	21	416
2009 Q3	50	42	41	552
2009 Q4	45	37	34	702
2010 Q1	41	37	33	775
2010 Q2	42	40	38	839
2010 Q3	41	32	30	860
2010 Q4	30	27	24	844
2011 Q1	26	24	24	888
2011 Q2	22	19	18	865
2011 Q3	26	25	19	844
2011 Q4	18	18	16	813
2012 Q1	16	13	12	772
2012 Q2	15	11	11	732
2012 Q3	12	11	11	694
2012 Q4	8	7	7	651
2013 Q1	4	4	4	612
2013 Q2	12	11	7	553
2013 Q3	4	4	3	515
Total	482	422	382	

Table 2 – Descriptive statistics

The table presents descriptive statistics for the universe of commercial banks available in the Call reports data for the quarter ending on September 30, 2008. To be included in the sample, banks have to survive the following screens: 1) the commercial bank or its bank holding company has less than $100bn of total assets; 2) the ratio between deposits and total assets is larger than zero; 3) the ratio between total gross loans and total assets is above (or equal) to 0.25; 4) the bank is not controlled by a majority foreign owner; 5) the age of the bank is at least 3 years. All non-binary variables are winsorized at 1% on both tails. Variables are described in the Appendix B.

	Mean	Median	25th Perc.	75th Perc.	Stand. Dev.	N
Age	70.54	81	27	104	42.42	6900
Brokered Deposits	3.95%	0.00%	0.00%	4.13%	7.90%	6900
C&I Loans	9.72%	8.28%	4.86%	13.02%	6.81%	6900
Cash	4.34%	3.02%	2.02%	4.90%	4.12%	6900
Cost Inefficiency	2.25%	2.14%	1.78%	2.57%	0.76%	6900
Credit Risk	72.72%	73.99%	64.10%	82.13%	12.82%	6900
Equity	10.60%	9.78%	8.40%	11.90%	3.30%	6900
Goodwill	0.46%	0.00%	0.00%	0.07%	1.28%	6900
House FS Subcommittee	13.51%	0.00%	0.00%	0.00%	34.18%	6900
Listed Banks	9.84%	0.00%	0.00%	0.00%	29.79%	6900
Loan Loss Reserves	0.93%	0.84%	0.64%	1.09%	0.49%	6900
Loans	68.59%	70.84%	59.67%	79.31%	14.31%	6900
Lobbying Dummy	1.03%	0.00%	0.00%	0.00%	10.09%	6900
Multibank	19.25%	0.00%	0.00%	0.00%	39.43%	6900
Non Interest Income	0.55%	0.45%	0.28%	0.68%	0.46%	6900
NPL	1.28%	0.74%	0.25%	1.64%	1.62%	6900
RE Loans	48.29%	49.63%	35.55%	61.92%	17.82%	6900
ROA	0.48%	0.61%	0.22%	0.93%	0.85%	6900
ROE	4.46%	5.81%	2.17%	9.10%	9.43%	6900
Size ($m)	410.57	143.72	68.21	323.42	1’017.07	6900

Table 3 – Failures & CPP

In Panel A, the table compares the numbers of failed banks and the number of commercial banks whose bank holding company received CPP money. Panel B reports CPP investments and failures by bank size, measured as the bank's total assets. In Panel C, the table provides descriptive statistics for the four subgroups (No CPP/No Failure; CPP; Failed; CPP & Failed). All non-binary variables are winsorized at 1% on both tails. Variables are described in the Appendix. Variables are defined in the Appendix B and measured at the end of the quarter ending on September 30, 2008.

Panel A: CPP & Failures

	Failure within 2011Q4		Failure within 2012Q4		Failure within 2013Q3	
	#	%	#	%	#	%
No CPP/No Failure	5760	83.48%	5725	82.97%	5711	82.77%
CPP	813	11.78%	807	11.70%	807	11.70%
Failed	314	4.55%	349	5.06%	363	5.26%
CPP & Failed	13	0.19%	19	0.28%	19	0.28%
Total	6900		6900		6900	

Panel B: CPP and Failures by Bank Size

Size Range (in $m)	CPP Investment		CPP Dummy		Failure 08-13		
	Total (in $m)	%	Total	%	Total	%	# Obs.
Less than $500	115'037.4	22.66%	461	55.81%	275	71.99%	5810
$500<= X <$1000	21'018.7	4.14%	148	17.92%	53	13.87%	598
$1000<= X <$2000	58'647.8	11.55%	78	9.44%	29	7.59%	243
$2000<= X <$3000	31'780.7	6.26%	38	4.60%	9	2.36%	85
Larger than $3000	281'286.6	55.40%	101	12.23%	16	4.19%	164
Total	507'771.0		826		382		6900

Panel C: Political Connections, CPP and Failures

CPP vs. Non-CPP.

	Non-CPP	CPP	Difference	p-value
House FS Subcom.	18.40%	12.84%	5.56%	0.0001
Lobbying Dummy	4.72%	0.53%	4.19%	0.0028
# Obs.	826	6074		

Failed vs. Non-Failed

	Failed	Non-Failed	Difference	p-value
House FS Subcom.	19.37%	13.16%	6.21%	0.0028
Lobbying Dummy	0.26%	1.07%	-0.81%	0.0055
# Obs.	382	6518		

Panel D: Descriptive Statistics

	No CPP/No Failure		CPP		Failed (2008-2013)		CPP/Failed		P-value Tests CPP vs. Failed	
Variable	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Age	75.02	87.00	54.59	36.00	37.38	21.00	36.32	11.00	0.0000	0.0000
Brokered Deposits	2.88%	0.00%	6.54%	3.38%	14.55%	10.98%	12.88%	12.34%	0.0000	0.0000
C&I Loans	9.32%	7.98%	12.38%	10.88%	9.74%	7.62%	15.37%	14.73%	0.0000	0.0000
Cash	4.59%	3.19%	3.11%	2.37%	3.28%	2.20%	3.19%	2.51%	0.4342	0.1640
Cost Inefficiency	2.25%	2.15%	2.21%	2.10%	2.39%	2.24%	2.22%	1.82%	0.0015	0.0430
Credit Risk	71.05%	71.88%	79.80%	81.07%	82.70%	83.88%	83.63%	83.15%	0.0000	0.0000
Equity	10.78%	9.93%	10.10%	9.16%	8.95%	8.42%	9.09%	9.35%	0.0000	0.0000
Goodwill	0.35%	0.00%	1.27%	0.06%	0.43%	0.00%	0.73%	0.00%	0.0000	0.0000
House FS Subcom.	12.41%	0.00%	18.46%	0.00%	19.56%	0.00%	15.79%	0.00%	0.6604	0.7170
Listed Banks	4.52%	0.00%	45.35%	0.00%	13.50%	0.00%	31.58%	0.00%	0.0000	0.0000
Loan Loss Reserves	0.88%	0.80%	1.03%	0.94%	1.56%	1.30%	0.98%	1.10%	0.0000	0.0000
Loans	67.09%	69.15%	74.97%	76.98%	77.67%	79.41%	77.05%	80.34%	0.0000	0.0000
Lobbying Dummy	0.54%	0.00%	4.83%	0.00%	0.28%	0.00%	0.00%	0.00%	0.0000	0.0000
Multibank	17.14%	0.00%	37.17%	0.00%	13.50%	0.00%	0.00%	0.00%	0.0000	0.0000
Non Interest income	0.55%	0.46%	0.61%	0.50%	0.40%	0.29%	0.57%	0.37%	0.0000	0.0000
NPL	1.09%	0.65%	1.30%	0.95%	4.23%	3.60%	1.42%	1.29%	0.0000	0.0000
RE Loans	46.15%	46.53%	56.05%	57.51%	64.32%	67.05%	54.94%	55.01%	0.0000	0.0000
ROA	0.59%	0.67%	0.28%	0.40%	-0.78%	-0.40%	0.01%	0.39%	0.0000	0.0000
ROE	5.59%	6.29%	3.07%	4.31%	-10.08%	-4.54%	-0.70%	4.02%	0.0000	0.0000
Size ($m)	273.60	121.19	1’282.91	428.78	570.74	246.86	1’466.52	270.75	0.0000	0.0000
# Obs.	5711		807		363		19			

Table 4. Probability to predict Failure, CPP, and CPP repayment at the onset of the crisis

The table reports the estimates of probit models to predict failure and CPP participation. In Panel A, we use independent variables measured right before the start of the CPP program (September, 30, 2008), while in Panel B independent variables are measured at the end of 2006. Only banks with data available on September 30, 2008 are included in the analysis (both Panel A and Panel B). Robust standard errors reported in brackets. All independent variables are winsorized at 1% on both tails. Variables are defined in the Appendix B. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Predictions based on Call reports Sept. 2008

	Failure 2008-2013 (I)	CPP (II)	Failure 2008-2013 (III)	CPP (IV)
Constant	-2.2850***	-4.5493***	-2.2221***	-4.5928***
	[0.6837]	[0.4595]	[0.6795]	[0.4554]
Age (log)	0.0097	-0.1352***	0.0148	-0.1408***
	[0.0390]	[0.0274]	[0.0394]	[0.0273]
Brokered Deposits	2.5320***	-0.2803	2.5422***	-0.3089
	[0.3575]	[0.3200]	[0.3574]	[0.3196]
C&I Loans	0.817	2.6895***	0.7716	2.5819***
	[1.1221]	[0.5053]	[1.1103]	[0.5041]
Cash	-1.8642	-0.7254	-1.8453	-0.8373
	[1.3132]	[0.9109]	[1.3220]	[0.9058]
Cost Ineff.	-11.123	9.5049*	-11.4886	9.1414*
	[7.0405]	[5.3495]	[7.0336]	[5.2687]
Credit Risk	2.1362***	1.1149***	2.1379***	1.0382***
	[0.6053]	[0.4083]	[0.6069]	[0.4018]
Equity	-11.6003***	-6.4416***	-11.6533***	-6.3165***
	[2.3494]	[1.2428]	[2.3535]	[1.2282]
Goodwill	15.8547***	17.9926***	15.8269***	17.6797***
	[4.0228]	[2.2592]	[4.0043]	[2.2377]
House FS Subcom.			0.1575*	0.0491
			[0.0952]	[0.0694]
Listed	-0.2747**	0.8604***	-0.2806**	0.8660***
	[0.1271]	[0.0737]	[0.1279]	[0.0734]
Loan Loss Reserves	11.0417	-3.1213	11.1864	-1.9435
	[9.0534]	[7.2640]	[9.0704]	[7.2051]
Loans	-1.5561	-0.123	-1.5497	-0.0721
	[1.0623]	[0.5183]	[1.0508]	[0.5098]
Lobbying Dummy	-0.8672**	0.8195***		
	[0.3738]	[0.1983]		
Multibank	-0.5147***	0.3325***	-0.5244***	0.3557***
	[0.1134]	[0.0641]	[0.1133]	[0.0629]
Noninterest Income	8.3532	-5.1688	8.7778	-4.4989
	[11.6717]	[7.9045]	[11.6540]	[7.7640]
NPL	16.8251***	-10.1689***	16.6683***	-10.0825***
	[2.1388]	[2.1478]	[2.1341]	[2.1467]
RE loans	2.1285**	0.9784***	2.1255**	0.8658**
	[0.8771]	[0.3484]	[0.8633]	[0.3464]
ROA	-30.6557***	-2.2871	-30.7617***	-1.8847
	[5.6827]	[4.3908]	[5.7005]	[4.3345]
Size (log)	-0.0286	0.2281***	-0.0369	0.2386***
	[0.0408]	[0.0283]	[0.0409]	[0.0280]
State Fixed Effects	yes	yes	yes	yes
Pseudo R2	0.4566	0.3323	0.4568	0.3295
Observations	6363	6888	6363	6888

Panel B: Predictions based on Call reports Dec. 2006

	Failure 2008-2013 (I)	CPP (II)	Failure 2008-2013 (III)	CPP (IV)
Constant	-3.7682***	-4.6234***	-3.7202***	-4.6625***
	[0.7185]	[0.4757]	[0.7138]	[0.4721]
Age (log)	-0.0815**	-0.0916***	-0.0783**	-0.0961***
	[0.0372]	[0.0277]	[0.0373]	[0.0277]
Brokered Deposits	2.8861***	-0.1193	2.8893***	-0.126
	[0.4382]	[0.3893]	[0.4392]	[0.3889]
C&I Loans	1.7149*	2.8460***	1.6350*	2.7201***
	[0.9994]	[0.4828]	[0.9928]	[0.4831]
Cash	-3.6197**	1.7454*	-3.4995*	1.7284*
	[1.8322]	[0.9873]	[1.8197]	[0.9807]
Cost Ineff.	3.0852	1.9866	2.7579	1.6686
	[6.8128]	[4.8258]	[6.7928]	[4.7789]
Credit Risk	2.9316***	1.3122***	2.9193***	1.2454***
	[0.5057]	[0.3956]	[0.5038]	[0.3923]
Equity	-3.7069**	-4.4385***	-3.6348**	-4.5346***
	[1.7463]	[1.2510]	[1.7310]	[1.2465]
Goodwill	13.9766***	13.8593***	13.5482***	13.6502***
	[3.6128]	[2.5006]	[3.5922]	[2.4921]
House FS Subcom.			0.1737*	0.0475
			[0.0914]	[0.0711]
Listed	-0.1253	0.8802***	-0.131	0.8858***
	[0.1195]	[0.0764]	[0.1201]	[0.0761]
Loan Loss Reserves	1.1082	26.5064***	1.157	26.6469***
	[12.1815]	[8.7442]	[12.1974]	[8.7427]
Loans	-3.1486***	-0.5737	-3.1294***	-0.4854
	[0.9686]	[0.4558]	[0.9600]	[0.4552]
Lobbying Dummy	-0.7246	0.7356***		
	[0.4651]	[0.2127]		
Multibank	-0.5227***	0.3355***	-0.5277***	0.3498***
	[0.1155]	[0.0647]	[0.1155]	[0.0638]
Noninterest Income	-8.8377	5.5456	-8.5146	6.1432
	[11.4266]	[7.0350]	[11.3911]	[6.9580]
NPL	26.4512***	-13.8640***	26.5312***	-13.4748***
	[4.3364]	[4.4774]	[4.3252]	[4.4674]
RE loans	3.4380***	0.9718***	3.4255***	0.8466***
	[0.7928]	[0.3086]	[0.7826]	[0.3084]
ROA	-15.9051**	-27.9732***	-15.7545**	-27.7004***
	[6.3431]	[5.3851]	[6.3099]	[5.3335]
Size (log)	0.0766	0.2257***	0.0689	0.2358***
	[0.0473]	[0.0309]	[0.0471]	[0.0305]
State Fixed Effects	yes	yes	yes	yes
Pseudo R2	0.3394	0.3222	0.3398	0.3201
Observations	5916	6552	5916	6552

Table 5. Did CPP banks outperform non-CPP banks?

Panel A presents the differences between CPP Banks and matched non-CPP banks at matching date (September 30, 2008). Panel B reports the estimates of means and medians for abnormal variables of CPP banks for quarters ending between December 31, 2008 and September 30, 2011. Quarter 0 is the quarter ending on September 30, 2008. *Abnormal* variables are measured as the difference between the variables of the CPP bank minus the corresponding variable of the matching firm. Matching firms are selected from the universe of commercial banks with available data on Sept. 30, 2008. Matching banks are selected using a propensity score approach, which relies on the probit model (II) of Table 4, Panel A. We also require that the matching bank is incorporated in the same state as the CPP bank. Abnormal variables are winsorized at the 2.5% level on both tails. In Panel B, the table reports the number of CPP banks and the number of matched banks that faced FDIC resolution before Sept. 30, 2013. Panel C presents the number of banks that failed in between Sep. 2008 and Sep. 2013 in both samples. Variable definitions are provided in the Appendix B.

Panel A: Differences between CPP Banks and Matched non-CPP banks at matching date (September 30, 2008)

				Tests (p-value)	
Abnormal Variable	Mean	Median	N. Obs.	Mean	Median
ROA	0.05%	-0.06%	826	0.1599	0.2760
ROE	1.20%	-0.51%	826	0.0094	0.6914
Loans	-0.33%	-0.63%	826	0.4671	0.2912
Equity	-0.17%	-0.23%	826	0.1938	0.1134
Credit Risk	-0.02%	-0.49%	826	0.9587	0.7229

Panel B: ROA, ROE, Loans, Equity, and Credit Risk

	Abnormal ROA		Abnormal ROE		Abnormal Loans		Abnormal Equity		Abnormal Credit Risk		
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	N
1 Quarter ahead	0.16%	-0.14%	3.47%	-1.34%	-0.79%	-1.55%	0.08%	0.06%	-0.45%	-0.55%	800
p-value tests	0.0386	0.1282	0.0005	0.2637	0.0923	0.045	0.4923	0.4219	0.3002	0.2506	
2 Quarters ahead	0.02%	-0.02%	0.38%	-0.17%	-0.74%	-1.06%	0.60%	0.55%	-0.26%	-0.22%	791
p-value tests	0.1442	0.4603	0.0627	0.5741	0.136	0.0978	0.0000	0.0000	0.5848	0.6386	
3 Quarters ahead	0.09%	-0.06%	3.10%	-0.41%	-1.02%	-1.08%	0.76%	0.73%	-0.33%	-0.06%	782
p-value tests	0.0333	0.5124	0.0000	0.9568	0.0421	0.0209	0.0000	0.0000	0.4786	0.6405	
4 Quarters ahead	0.05%	-0.14%	6.16%	-1.24%	-0.74%	-1.01%	0.86%	0.75%	-0.19%	-0.03%	770
p-value tests	0.4468	0.0801	0.0000	0.4193	0.152	0.0862	0.0000	0.0000	0.6883	0.5957	
5 Quarters ahead	0.14%	-0.20%	12.87%	-1.42%	-0.79%	-1.14%	0.89%	0.65%	-0.59%	-0.30%	765
p-value tests	0.1567	0.2702	0.0000	0.9734	0.1138	0.0740	0.0000	0.0000	0.201	0.3125	
6 Quarters ahead	0.05%	-0.02%	1.45%	-0.12%	-0.35%	-1.00%	0.94%	0.64%	-0.54%	0.02%	759
p-value tests	0.0056	0.8652	0.0000	0.8441	0.4824	0.4892	0.0000	0.0000	0.2552	0.5222	
7 Quarters ahead	0.06%	-0.03%	3.57%	-0.17%	-0.18%	-0.32%	0.80%	0.56%	-0.37%	0.43%	723
p-value tests	0.0987	0.6872	0.0000	0.6355	0.7286	0.6901	0.0000	0.0000	0.441	0.7871	
8 Quarters ahead	0.10%	-0.06%	5.06%	-0.47%	0.14%	-0.30%	0.61%	0.36%	-0.36%	-0.08%	717
p-value tests	0.0832	0.4703	0.0000	0.9489	0.7895	0.9935	0.0000	0.0001	0.4532	0.5916	
9 Quarters ahead	0.20%	-0.09%	12.02%	-0.98%	-0.07%	-0.83%	0.64%	0.32%	-0.67%	-0.20%	703
p-value tests	0.0301	0.3684	0.0000	0.2541	0.8888	0.5363	0.0000	0.0006	0.175	0.2632	
10 Quarters ahead	-0.01%	-0.03%	1.10%	-0.29%	0.01%	-0.43%	0.54%	0.23%	-0.68%	-0.01%	695
p-value tests	0.3703	0.0303	0.0015	0.0835	0.9847	0.7846	0.0001	0.0054	0.1741	0.2871	
11 Quarters ahead	-0.02%	-0.06%	2.63%	-0.50%	0.27%	0.04%	0.46%	0.16%	-0.28%	0.11%	679
p-value tests	0.5265	0.0888	0.0004	0.1666	0.632	0.8961	0.0012	0.0265	0.5725	0.5877	
12 Quarters ahead	0.03%	-0.05%	7.22%	-0.37%	0.58%	0.17%	0.50%	0.26%	-0.24%	0.23%	667
p-value tests	0.486	0.3038	0.0000	0.467	0.3118	0.5969	0.0005	0.0157	0.6399	0.7881	

Panel C: Failures over the period September 30, 2008- September 30, 2013

	# Resolution	% Resolution	# Observations
CPP Sample	19	2.30%	826
Matching Sample	110	13.32%	826
	T-test for difference		
		t-stat	p-value
CPP vs. Matching Sample		8.251	0.000

Table 6. Did CPP banks outperform non-CPP banks that did not fail?

Panel A presents the differences between CPP Banks and matched non-CPP banks that did not fail at matching date (September 30, 2008). Panel B reports the estimates of means and medians for abnormal variables of CPP banks for quarters ending between December 31, 2008 and September 30, 2011. Quarter 0 is the quarter ending on September 30, 2008. *Abnormal* variables are measured as the difference between the variables of the CPP bank minus the corresponding variable of the matching firm. Matching firms are selected from the universe of commercial banks with available data on Sept. 30, 2008. Matching banks are selected using a propensity score approach, which relies on the probit models (II) and (V) of Table 4, Panel A. We also require that: 1) the matching bank is incorporated in the same state as the CPP bank; 2) the matching bank did not fail in the next five years. Abnormal variables are winsorized at the 2.5% level on both tails. In Panel B, the table reports the number of CPP banks and the number of matched banks that faced FDIC resolution before Sept. 30, 2013. Variable definitions are provided in the Appendix B.

Panel A: Differences between CPP Banks and Matched non-CPP banks at matching date (September 30, 2008)

				Tests (p-value)	
Abnormal Variable	Mean	Median	N. Obs.	Mean	Median
ROA	-0.09%	-0.11%	826	0.0065	0.0000
ROE	-0.67%	-0.99%	826	0.0572	0.0009
Loans	-0.39%	-0.85%	826	0.3929	0.1704
Equity	-0.24%	-0.36%	826	0.0708	0.0272
Credit Risk	-0.09%	-0.58%	826	0.8258	0.5187

Panel B: ROA, ROE, Loans, Equity, and Credit Risk – PSM with Lobbying Dummy

	Abnormal ROA		Abnormal ROE		Abnormal Loans		Abnormal Equity		Abnormal Credit Risk		
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	N
1 Quarter ahead	0.16%	-0.14%	3.47%	-1.34%	-0.79%	-1.55%	0.08%	0.06%	-0.45%	-0.55%	800
p-value tests	0.0386	0.1282	0.0005	0.2637	0.0923	0.0450	0.4923	0.4219	0.3002	0.2506	
2 Quarters ahead	0.02%	-0.02%	0.38%	-0.17%	-0.74%	-1.06%	0.60%	0.55%	-0.26%	-0.22%	791
p-value tests	0.1442	0.4603	0.0627	0.5741	0.1360	0.0978	0.0000	0.0000	0.5848	0.6386	
3 Quarters ahead	0.09%	-0.06%	3.10%	-0.41%	-1.02%	-1.08%	0.76%	0.73%	-0.33%	-0.06%	782
p-value tests	0.0333	0.5124	0.0000	0.9568	0.0421	0.0209	0.0000	0.0000	0.4786	0.6405	
4 Quarters ahead	0.05%	-0.14%	6.16%	-1.24%	-0.74%	-1.01%	0.86%	0.75%	-0.19%	-0.03%	770
p-value tests	0.4468	0.0801	0.0000	0.4193	0.1520	0.0862	0.0000	0.0000	0.6883	0.5957	
5 Quarters ahead	0.14%	-0.20%	12.87%	-1.42%	-0.79%	-1.14%	0.89%	0.65%	-0.59%	-0.30%	765
p-value tests	0.1567	0.2702	0.0000	0.9734	0.1138	0.0740	0.0000	0.0000	0.2010	0.3125	
6 Quarters ahead	0.05%	-0.02%	1.45%	-0.12%	-0.35%	-1.00%	0.94%	0.64%	-0.54%	0.02%	759
p-value tests	0.0056	0.8652	0.0000	0.8441	0.4824	0.4892	0.0000	0.0000	0.2552	0.5222	
7 Quarters ahead	0.06%	-0.03%	3.57%	-0.17%	-0.18%	-0.32%	0.80%	0.56%	-0.37%	0.43%	725
p-value tests	0.0987	0.6872	0.0000	0.6355	0.7286	0.6901	0.0000	0.0000	0.4410	0.7871	
8 Quarters ahead	0.10%	-0.06%	5.06%	-0.47%	0.14%	-0.30%	0.61%	0.36%	-0.36%	-0.08%	719
p-value tests	0.0832	0.4703	0.0000	0.9489	0.7895	0.9935	0.0000	0.0001	0.4532	0.5916	
9 Quarters ahead	0.20%	-0.09%	12.02%	-0.98%	-0.07%	-0.83%	0.64%	0.32%	-0.67%	-0.20%	705
p-value tests	0.0301	0.3684	0.0000	0.2541	0.8888	0.5363	0.0000	0.0006	0.1750	0.2632	
10 Quarters ahead	-0.01%	-0.03%	1.10%	-0.29%	0.01%	-0.43%	0.54%	0.23%	-0.68%	-0.01%	697
p-value tests	0.3703	0.0303	0.0015	0.0835	0.9847	0.7846	0.0001	0.0054	0.1741	0.2871	
11 Quarters ahead	-0.02%	-0.06%	2.63%	-0.50%	0.27%	0.04%	0.46%	0.16%	-0.28%	0.11%	682
p-value tests	0.5265	0.0888	0.0004	0.1666	0.6320	0.8961	0.0012	0.0265	0.5725	0.5877	
12 Quarters ahead	0.03%	-0.05%	7.22%	-0.37%	0.58%	0.17%	0.50%	0.26%	-0.24%	0.23%	670
p-value tests	0.4860	0.3038	0.0000	0.4670	0.3118	0.5969	0.0005	0.0157	0.6399	0.7881	

Table 7. CPP and the likelihood of Failure

The table reports the estimates of hazard ratios for a hazard rate model to predict failure. A Cox proportional hazards model is employed. The sample period includes quarters ending between December 31, 2008, and December 31, 2009 (five quarters) in Columns I and II; and between December 31, 2008, and December 31, 2010 (nine quarters) in Columns III and IV; and between December 31, 2008 and September 30, 2013 (20 quarters). Robust standard errors are reported in brackets. All independent variables are winsorized at 1% on both tails. All regressions models include state fixed effects. Variable definitions are provided in the Appendix B. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(I)	(II)	(III)	(IV)	(V)	(VI)
Failure between:	*2008Q4 – 2009Q4*	*2008Q4 – 2009Q4*	*2008Q4 – 2010Q4*	*2008Q4 – 2010Q4*	*2008Q4 – 2013Q3*	*2008Q4 – 2013Q3*
CPP	-1.0097**	-1.0080**	-1.1161***	-1.1095***	-0.5713***	-0.6016***
	[0.4786]	[0.4783]	[0.4034]	[0.4036]	[0.2068]	[0.2145]
CPP Repaid		-38.3101		-37.4020***		0.8222
		[0.0000]		[0.8667]		[0.6767]
Age (log)	-0.0401	-0.0402	0.0962*	0.0961*	0.0543	0.0555
	[0.0962]	[0.0962]	[0.0563]	[0.0562]	[0.0458]	[0.0458]
Brokered Deposits	1.2366	1.236	0.9165	0.9151	0.8361	0.8367
	[1.2258]	[1.2258]	[0.6852]	[0.6852]	[0.6039]	[0.6041]
C&I Loans	-4.1345	-4.1347	-0.2251	-0.2213	-0.2125	-0.2256
	[3.0628]	[3.0626]	[1.6171]	[1.6166]	[1.2807]	[1.2807]
Cash	1.7296	1.7291	0.6609	0.6597	0.2211	0.2254
	[1.5948]	[1.5947]	[1.1034]	[1.1032]	[0.8253]	[0.8245]
Cost Ineff.	39.6377***	39.6358***	31.7804***	31.7587***	25.1025***	25.3622***
	[9.1056]	[9.1049]	[6.8870]	[6.8866]	[5.1386]	[5.1596]
Credit Risk	2.4942*	2.4941*	2.9877***	2.9870***	3.6669***	3.6737***
	[1.3460]	[1.3461]	[0.8713]	[0.8711]	[0.6830]	[0.6833]
Equity	-121.041***	-121.016***	-133.191***	-133.164***	-148.724***	-148.752***
	[25.7464]	[25.7535]	[20.0065]	[20.0132]	[18.8585]	[18.8290]
Goodwill	25.0147	25.0134	17.9511	17.9644	18.781	18.722
	[17.2267]	[17.2271]	[13.5528]	[13.5530]	[12.5831]	[12.5870]
Listed	-0.3339	-0.3339	-0.2111	-0.2107	-0.001	-0.0016
	[0.2852]	[0.2852]	[0.1870]	[0.1869]	[0.1459]	[0.1462]
Loan Loss Reserves	12.6114	12.6117	23.5052**	23.5001**	24.1547***	24.1782***
	[15.5792]	[15.5793]	[10.4601]	[10.4607]	[8.3629]	[8.3715]
Loans	-2.4134	-2.413	-2.9411**	-2.9410**	-3.1432***	-3.1552***
	[2.1600]	[2.1598]	[1.4306]	[1.4298]	[1.1745]	[1.1757]
Lobbying Dummy	1.6866**	1.6857**	0.3671	0.3629	0.1706	0.1839
	[0.7933]	[0.7937]	[0.9291]	[0.9309]	[0.8063]	[0.8036]
Multibank	0.2862	0.2864	-0.003	-0.0031	-0.4200**	-0.4179**
	[0.2338]	[0.2339]	[0.1933]	[0.1933]	[0.1924]	[0.1925]
Noninterest Income	-81.9266**	-81.9189**	-67.6349***	-67.6056***	-45.3250***	-45.6068***
	[41.6284]	[41.6288]	[22.8039]	[22.8036]	[14.9045]	[14.9157]
NPL	24.9180***	24.9192***	21.6058***	21.6004***	24.9016***	24.9102***
	[6.1660]	[6.1661]	[3.9790]	[3.9794]	[3.1962]	[3.1970]
RE loans	0.5748	0.5744	1.1036	1.1055	0.5473	0.5459
	[2.1428]	[2.1426]	[1.2195]	[1.2189]	[1.0253]	[1.0262]
ROA	-43.5961**	-43.5994**	-58.8724***	-58.8699***	-69.2630***	-69.1243***
	[19.9865]	[19.9874]	[13.0935]	[13.0919]	[9.5069]	[9.5095]
Size (log)	0.1456	0.1456	0.0916	0.0915	0.0447	0.0459
	[0.0962]	[0.0962]	[0.0659]	[0.0658]	[0.0516]	[0.0517]
State Fixed Effects	yes	yes	yes	yes	yes	yes
Pseudo R2	0.4246	0.4246	0.3998	0.3998	0.4153	0.4154
Observations	20619	20619	47543	47543	114291	114291

Table 8. Do failed banks perform worse than CPP banks?

Panel A presents the differences between failed banks and matched CPP banks at matching date (September 30,2008). Panel B reports the estimates of means and medians for abnormal variables of failed banks for quarters ending between December 31, 2008 and September 30, 2011. Quarter 0 is the quarter ending on September 30, 2008. Abnormal variables are measured as the difference between the variable of the failed bank minus the corresponding variable of the matching firm. Matching firms are banks that participated to the CPP program. Matching banks are selected using a propensity score approach, which relies on the probit model (I) of Table 4, Panel A. Abnormal variables are winsorized at the 2.5% level on both tails. Variable definitions are provided in the Appendix B.

Panel A: Differences between Failed Banks and Matched CPP banks at matching data (September 30, 2008)

				Tests (p-values)	
Abnormal Variable	Mean	Median	N. Obs.	Mean	Median
ROA	0.09%	-0.11%	382	0.4884	0.1531
ROE	-4.34%	-2.21%	382	0.0145	0.0054
Loans	-1.92%	-1.77%	382	0.0016	0.0011
Equity	-0.89%	-0.70%	382	0.0000	0.0000
Credit Risk	-4.01%	-3.92%	382	0.0000	0.0000

Panel B: ROA, ROE, Loans, Equity, Credit Risk

	Abnormal ROA		Abnormal ROE		Abnormal Loans		Abnormal Equity		Abnormal Credit Risk		
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	N
1 Quarter ahead	-0.58%	-0.73%	-27.15%	-12.15%	-1.73%	-2.22%	-1.94%	-1.84%	-3.48%	-3.77%	373
p-value tests	0.0033	0.0000	0.0000	0.0000	0.0049	0.0033	0.0000	0.0000	0.0000	0.0000	
2 Quarters ahead	-0.58%	-0.18%	-17.86%	-2.30%	-2.28%	-3.02%	-2.60%	-2.47%	-2.35%	-3.28%	353
p-value tests	0.0000	0.0000	0.0000	0.0000	0.0011	0.0013	0.0000	0.0000	0.0005	0.0003	
3 Quarters ahead	-1.40%	-0.70%	-17.07%	-9.25%	-1.89%	-2.06%	-3.43%	-2.91%	-2.48%	-3.19%	332
p-value tests	0.0000	0.0000	0.0362	0.0000	0.0042	0.0047	0.0000	0.0000	0.0002	0.0000	
4 Quarters ahead	-1.71%	-1.33%	-61.01%	-21.56%	-1.05%	-0.70%	-3.53%	-3.14%	-2.47%	-2.58%	290
p-value tests	0.0000	0.0000	0.0000	0.0000	0.1153	0.1093	0.0000	0.0000	0.0002	0.0001	
5 Quarters ahead	-2.86%	-2.78%	-129.25%	-71.91%	-1.44%	-1.29%	-4.74%	-4.79%	-2.47%	-3.00%	257
p-value tests	0.0000	0.0000	0.0000	0.0000	0.0474	0.0327	0.0000	0.0000	0.0008	0.0005	
6 Quarters ahead	-0.44%	-0.35%	-9.76%	-5.70%	-2.21%	-2.82%	-4.87%	-4.78%	-2.71%	-3.54%	224
p-value tests	0.0000	0.0000	0.1527	0.0000	0.0079	0.0059	0.0000	0.0000	0.0010	0.0004	
7 Quarters ahead	-1.28%	-1.17%	-65.55%	-26.00%	-0.86%	-2.19%	-4.86%	-5.09%	-0.99%	-1.97%	175
p-value tests	0.0000	0.0000	0.0000	0.0000	0.3508	0.2722	0.0000	0.0000	0.2753	0.1009	
8 Quarters ahead	-2.07%	-2.03%	-77.54%	-45.72%	-0.23%	-0.61%	-4.84%	-5.32%	0.26%	-1.41%	147
p-value tests	0.0000	0.0000	0.0000	0.0000	0.8151	0.7090	0.0000	0.0000	0.7824	0.6495	
9 Quarters ahead	-3.10%	-3.16%	-207.50%	-82.94%	-0.14%	-0.07%	-5.76%	-5.77%	0.72%	-0.91%	125
p-value tests	0.0000	0.0000	0.0000	0.0000	0.8970	0.8640	0.0000	0.0000	0.4774	0.8063	
10 Quarters ahead	-0.85%	-0.64%	-40.69%	-17.61%	0.53%	0.28%	-6.08%	-6.08%	1.97%	0.23%	101
p-value tests	0.0000	0.0000	0.0012	0.0000	0.6758	0.7361	0.0000	0.0000	0.1171	0.2836	
11 Quarters ahead	-1.77%	-1.72%	-54.72%	-46.47%	0.19%	0.03%	-6.01%	-6.08%	1.69%	1.73%	85
p-value tests	0.0000	0.0000	0.0061	0.0000	0.8773	0.8902	0.0000	0.0000	0.1706	0.2447	
12 Quarters ahead	-3.07%	-2.77%	-153.69%	-75.68%	-2.03%	-2.17%	-6.81%	-6.75%	0.23%	-0.65%	66
p-value tests	0.0000	0.0000	0.0000	0.0000	0.1268	0.1168	0.0000	0.0000	0.8741	0.8555	

Table 9. Failures, CPP, and TAF

Panel A reports the number and percentage of banks that received TAF loans during the period 2007-2010. Panel B reports the amount of loans received. All loans are included (i.e. loans that are renewed are counted). Matching non-CPP banks are described in Section 5.2.

Panel A: TAF Recipient

	TAF		TAF pre Sept. 2008		TAF post Sept. 2008	
	#	%	#	%	#	%
No CPP/No Failure	119	48.77%	26	10.66%	114	46.72%
CPP	108	44.26%	34	13.93%	103	42.21%
Failed	14	5.74%	4	1.64%	12	4.92%
CPP/Failed	3	1.23%	2	0.82%	1	0.41%
Total	244	100.00%	66	27.05%	230	94.26%

Panel B: Loan Amount Received

	TAF		TAF pre Sept. 2008		TAF post Sept. 2008	
	Amount (in $m)	% Total TAF	Amount (in $m)	% Total TAF %	Amount (in $m)	% Total TAF
No CPP/No Failure	77'482.4	10.39%	11'012.8	1.48%	66'469.6	8.91%
CPP	664'833.9	89.13%	263'495.6	35.32%	401'338.3	53.80%
Failed	2'988	0.40%	827.5	0.11%	2'160.5	0.29%
CPP/Failed	630	0.08%	55	0.01%	575	0.08%
Total	745'934.3		275'390.9	36.92%	470'543.4	63.08%

Table 10. Cost of Saving the Failed Banks

Panel A presents descriptive statistics for estimated losses, total assets, risk-weighted assets, the probability of failure (p_F),and the probability of failure given government assistance (p_{FR}). Panel B (Panel C) reports means and medians for the expected cost of failure, the expected cost of rescue, their difference, and the number of salveageble banks under different scenarios based on the ratio between p_F and p_{FR}, where p_{FR} is the probability of failure given rescue, in a delay (no delay) situation. We consider three p_F/ p_{FR} ratios: 2, 3, and 5.79, corresponding to values of π of 0.5, 0.6667 and 0.8237. Values are in $ millions.

Panel A: Estimated Loss, Total Assets, Risk-Weighted Assets, and probabilities

	Estimated Loss (in $ millions)	Total Assets (in $ millions)	Risk-Weighted Assets (in $ millions)	P_F
Mean	130.256	673.776	560.453	41.99%
Median	60.442	254.522	204.856	37.00%
N. Obs.	367	367	367	367
Total	47'804.099			

Panel B: Expected cost of failure and expected cost of rescue in a delay situation (in $ millions)

Ratio p_F/ p_{FR}	2			3		5.79	
	(1) Expected cost of Failure	(2) Expected Cost of Bailouts	(3) Difference (2)-(1)	(4) Expected Cost of Bailouts	(5) Difference (4)-(1)	(6) Expected Cost of Bailouts	(7) Difference (6)-(1)
				CPP funding recoverable			
Mean	60.247	34.257	25.991	22.838	37.410	11.830	48.417
Median	22.471	13.708	8.913	9.139	13.472	4.734	17.978
Total	22'110.814	12'572.149	9'538.665	8'381.432	13'729.382	4'341.734	17'769.080
N.Obs	367	367	367	367	367	367	367
# Salvageable Banks			365		367		367
% Salvageable Banks			99.45%		1		1
				CPP funding non recoverable			
Mean	60.247	49.820	10.428	39.779	20.469	30.099	30.148
Median	22.471	23.748	0.366	19.760	3.737	15.946	7.196
Total	22'110.814	18'283.864	3'826.950	14'598.728	7'512.086	11'046.391	11'064.423
N.Obs	367	367	367	367	367	367	367
# Salvageable Banks			187		213		227
% Salvageable Banks			50.95%		58.04%		61.86%

Panel C: Expected cost of failure and expected cost of rescue in a no delay situation (in $ millions)

Ratio p_F/ p_{FR}		2		3		5.79	
	(1) Expected cost of Failure	(2) Expected Cost of Bailouts	(3) Difference (2)-(1)	(4) Expected Cost of Bailouts	(5) Difference (4)-(1)	(6) Expected Cost of Bailouts	(7) Difference (6)-(1)
				CPP funding recoverable			
Mean	39.498	23.695	15.803	15.797	23.701	8.183	31.315
Median	7.004	6.048	2.126	4.032	3.720	2.088	5.294
Total	14'495.801	8'696.100	5'799.702	5'797.399	8'698.402	3'003.158	11'492.644
N.Obs	367	367	367	367	367	367	367
# Salvageable Banks			250		257		261
% Salvageable Banks			68.12%		70.03%		71.12%
				CPP funding non recoverable			
Mean	39.498	38.488	1.010	31.905	7.593	25.559	13.939
Median	7.004	16.957	-3.156	15.543	-1.812	13.258	-1.344
Total	14'495.801	14'124.965	370.837	11'708.997	2'786.804	9'380.093	5'115.708
N.Obs	367	367	367	367	367	367	367
# Salvageable Banks			131		148		163
% Salvageable Banks			35.69%		40.32%		44.41%

Appendix A: CPP & Bank failures by State

	Failure 08-11	% Failure 08-11	Failure 08-12	% Failure 08-12	Failure 08-13	% Failure 08-12	CPP Dummy	% CPP dummy	Obs.
AK	0	0.00%	0	0.00%	0	0.00%	1	16.67%	6
AL	4	3.01%	5	3.76%	5	3.76%	19	14.29%	133
AR	1	0.73%	1	0.73%	1	0.73%	15	10.95%	137
AZ	10	27.78%	10	27.78%	12	33.33%	5	13.89%	36
CA	29	13.24%	30	13.70%	30	13.70%	68	31.05%	219
CO	8	6.35%	8	6.35%	8	6.35%	13	10.32%	126
CT	0	0.00%	0	0.00%	0	0.00%	5	11.63%	43
DC	0	0.00%	0	0.00%	0	0.00%	2	40.00%	5
DE	0	0.00%	0	0.00%	0	0.00%	10	71.43%	14
FL	41	19.52%	48	22.86%	51	24.29%	38	18.10%	210
GA	63	22.66%	72	25.90%	74	26.62%	43	15.47%	278
HI	0	0.00%	0	0.00%	0	0.00%	1	25.00%	4
IA	1	0.28%	1	0.28%	1	0.28%	11	3.06%	359
ID	0	0.00%	0	0.00%	0	0.00%	4	28.57%	14
IL	45	7.67%	52	8.86%	53	9.03%	72	12.27%	587
IN	2	1.72%	2	1.72%	2	1.72%	16	13.79%	116
KS	6	1.85%	7	2.16%	7	2.16%	18	5.56%	324
KY	0	0.00%	0	0.00%	0	0.00%	21	11.86%	177
LA	2	1.52%	2	1.52%	2	1.52%	13	9.85%	132
MA	1	0.68%	1	0.68%	1	0.68%	9	6.12%	147
MD	2	3.85%	4	7.69%	4	7.69%	22	42.31%	52
ME	0	0.00%	0	0.00%	0	0.00%	4	19.05%	21
MI	9	6.47%	10	7.19%	10	7.19%	17	12.23%	139
MN	16	3.97%	18	4.47%	19	4.71%	17	4.22%	403
MO	7	2.22%	11	3.49%	11	3.49%	35	11.11%	315
MS	2	2.25%	2	2.25%	2	2.25%	16	17.98%	89
MT	0	0.00%	0	0.00%	0	0.00%	1	1.43%	70
NC	4	5.26%	5	6.58%	6	7.89%	32	42.11%	76
ND	0	0.00%	0	0.00%	0	0.00%	3	3.33%	90
NE	2	0.87%	2	0.87%	2	0.87%	10	4.37%	229
NH	0	0.00%	0	0.00%	0	0.00%	4	28.57%	14
NJ	3	4.00%	3	4.00%	3	4.00%	21	28.00%	75
NM	2	4.44%	2	4.44%	2	4.44%	4	8.89%	45
NV	7	28.00%	7	28.00%	7	28.00%	4	16.00%	25
NY	3	2.94%	3	2.94%	3	2.94%	14	13.73%	102
OH	2	1.16%	2	1.16%	2	1.16%	18	10.47%	172
OK	4	1.65%	5	2.07%	5	2.07%	6	2.48%	242
OR	6	18.18%	6	18.18%	6	18.18%	5	15.15%	33
PA	3	1.65%	4	2.20%	4	2.20%	34	18.68%	182
RI	0	0.00%	0	0.00%	0	0.00%	2	33.33%	6
SC	4	6.67%	4	6.67%	4	6.67%	19	31.67%	60
SD	1	1.27%	1	1.27%	1	1.27%	2	2.53%	79
TN	0	0.00%	3	1.73%	5	2.89%	27	15.61%	173
TX	7	1.27%	7	1.27%	7	1.27%	32	5.81%	551
UT	6	11.32%	6	11.32%	6	11.32%	8	15.09%	53
VA	1	1.08%	1	1.08%	1	1.08%	30	32.26%	93
VT	0	0.00%	0	0.00%	0	0.00%	0	0.00%	12
WA	17	22.08%	17	22.08%	18	23.38%	20	25.97%	77
WI	5	1.95%	5	1.95%	6	2.33%	23	8.95%	257
WV	0	0.00%	0	0.00%	0	0.00%	7	11.48%	61
WY	1	2.70%	1	2.70%	1	2.70%	5	13.51%	37
Total	327		368		382		519		6900

Appendix B: Variable Definitions

Variable Name	Definition (Call reports codes in parentheses)
Age	Difference between sample year and the year of opening (RSSD9950)
Brokered Deposits	Brokered deposits scaled by total assets (RCON2365/ RCFD2170)
C&I Loans	Commercial and industrial loans scaled by total assets (RCON1766/RCFD2170)
Cash	Cash scaled by total assets (RCFD0010/RCFD2170)
Cost Inefficiency	Noninterest expenses divided by total assets (riad4093/RCFD2170)
Credit risk	Risk weighted assets scaled by total assets (RCONA223/RCFD2170)
Crisis Dummy	Binary variable that takes value one in years 2008 and 2009
Equity	Total equity capital scaled by total assets (RCFD3210/ RCFD2170)
Failure 08-11	Binary variable that takes value 1 if the bank fails between Sept. 30, 2008 and Dec. 31, 2011.
Failure 08-12	Binary variable that takes value 1 if the bank fails between Sept. 30, 2008 and Dec. 31, 2012.
Failure 08-13	Binary variable that takes value 1 if the bank fails between Sept. 30, 2008 and Sep. 31, 2013.
Goodwill	Godwill scaled by total assets (RCFD163/RCFD2170)
House FS Subcommittee	Binary variable equal to 1 if the House member representing the voting district of a firm's headquarters served on the Capital Markets Subcommittee or the Financial Institutions Subcommittee of the House Financial Services Committee in 2008 or 2009.
Leverage ratio	Tier1 capital over total assets (RCFD8274/RCFD2170)
Listed	Binary variable that takes value 1 if the bank or its bank holding company is listed on a major stock exchange.
Loan Loss Reserves	Loan loss allowance scaled by total assets (RCFD3123/RCFD2170)
Loans	Total Loans & Leases, scaled by total assets (RCFD1400/ RCFD2170)
Lobbying Dummy	Binary variable that takes value 1 if the bank *i* lobbied in 2007-08. We obtain data on lobbying expenditures from the opensecrets.org - Center for Responsive Politics (CRP). The data are compiled using quarterly lobbying disclosure reports filed with the Secretary of the Senate's Office of Public Records.
Multibank	Binary variable that takes value 1 if the bank is affiliated to a bank holding company with more than one commercial banks in the sample.
Non Interest Income	Total noninterest income scaled by total assets (riad4079/RCFD2170)
NPL	loans 90 days past due plus nonaccrual loans scaled total assets ((RCFD1407+RCFD1403)/ RCFD2170)
RE Loans	Real estate loans scaled by total assets (RCFD1410/RCFD2170)
Repaid TARP	Binary variable that takes value one in quarters after the bank repaid TARP funds.
ROA	Net Income scaled by total assets (RIAD4340/RCFD2170)
ROE	Net Income scaled by total equity capital (RIAD4340/RCFD3120)
Size	Total assets (RCFD2170)
Tarp	Binary variable that takes value one in quarters after the bank received TARP funds.
Tier 1 Ratio	Tier 1 capital over risk-weighted assets (RCFD8274/RCFD223)