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THE CONTRACTION IN COMMUNITY BANK LENDING AFTER THE 2008 GSE TAKEOVER

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ABSTRACT

In September 2008, the government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac were placed into conservatorship and dividend payments on common and preferred shares were suspended. As a result, share prices fell to nearly zero and many banks across the country lost the value of their investments in the preferred shares. We estimate more than 600 depository institutions in the United States were exposed to at least $8 billion in investment losses from these securities. In addition, fifteen failures and two distressed mergers either directly or indirectly resulted from the takeover. Since these GSE investments were considered to be safe investments by banks, regulators, and rating agencies, we consider these losses to be exogenous shocks to bank capital, and use this event to examine the relationship between community bank condition and lending during this crisis. We find that in the quarter following the takeover of Fannie Mae and Freddie Mac, the measured Tier 1 capital ratio at exposed banks fell about three percent on average, and loan growth at exposed banks with median capitalization was about 2 percentage points lower compared to other banks in the following quarter. Consequently, considering the set of community banks that incurred about $2 billion in GSE-related losses, and assuming that each bank reduced loan growth by 2 percentage points, the estimated aggregate lending drop among these banks would be roughly $4 billion.

Keywords: Banking; financial crisis; government sponsored enterprise; credit contraction

JEL Classification: G21, G28, E61

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1. Introduction

On September 7, 2008, the Treasury Department and the Federal Housing Finance Agency announced that the housing-related government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac, had been placed into conservatorship. The GSEs' equity prices dropped considerably in response, and, as a result, many banks that held sizable amounts of the preferred stock of the two GSEs had to recognize substantial losses.

Equally important as the size of these losses was the environment in which they occurred. The fallout from the financial crisis and the resulting economic downturn weighed heavily on the condition of the U.S. commercial banking industry in 2008, and the industry remained under significant pressure in 2009. As house prices declined sharply, the performance of real estate-related assets deteriorated, and, with the onset of recession, credit problems spread to other asset classes and to a wider range of financial institutions. Sizable losses and write-downs deepened concerns about the condition of some very large financial institutions. Meanwhile, with banks reluctant to lend to one another in the fall of 2008, the cost of borrowing in the interbank market increased appreciably, and securitization markets, with the exception of those for government-supported mortgages, essentially shut down.[1]

Reflecting these adverse conditions, 139 banks and 26 other depository institutions failed in 2008-2009, and the watch list of the Federal Deposit Insurance Corporation (FDIC) expanded to include about 700 institutions by year-end 2009, the highest levels for both of these measures since the early 1990s. The Treasury provided a large amount of capital to banking institutions under the Troubled Asset Relief Program (TARP), and a substantial volume of that capital was downstreamed by parent holding companies to their commercial bank subsidiaries.

Altogether, a number of unprecedented shocks placed the banking industry under extreme stress. We focus in this paper on one particular exogenous shock to the health of U.S. banks: the set of losses related to GSE preferred stock holdings. These GSE preferred securities were assigned an

[1] For a more comprehensive description of the financial crisis and its impact on bank profitability and condition of U.S. banks, see Bech and Rice (2009) and Lee and Rose (2010).

Aa3 credit rating and were widely held by banks.[2] Given the advantages of holding these securities, including the relatively high yields and the low perceived risks, investments in the preferred shares were extensive across banks, particularly community banks, and at other financial institutions. Banks were able to hold considerable amounts GSE preferred shares because, even though banks are normally restricted from investing substantially in equity securities, an exemption to the standard limits on permissible equity securities was established for the GSE investments.[3]

We have three objectives in this paper. First, we document and describe the losses incurred by community banks as an unintended consequence of the policy decision to take the GSEs into conservatorship. Second, we use this event to examine the relationship between bank health and bank lending during a period of extreme stress in the banking sector. Finally, we discuss how results of our study are applied more broadly to developments in bank condition and their effect on lending.

The GSE takeover is central to our study in two important respects. First, the banks' losses on GSE preferred securities serve as an instrument for changes in bank capital in the study of the relationship between bank health and bank lending. Without a valid instrument, such a parsing of the importance of supply and demand in loan growth is difficult. We consider the GSE losses to be a random shock to bank capital and will show that the losses from GSE preferred shares appear to be distributed across banks in a way that is random and thus plausibly exogenous to other bank characteristics.

Second, this event provides a natural experiment to study the relationship between bank health and lending under a period of crisis, when banks were under considerable capital pressure. In good (profitable) times and, importantly, with a substantial capital buffer, a single hit to bank

[2] The rating is from Moody's, whose highest rating is Aaa, followed by Aa1, Aa2, and Aa3. "Moody's judges obligations rated Aa to be high quality, with `very low credit risk', but `their susceptibility to long-term risks appears somewhat greater'.

[3] See 12 U.S.C. §24 (Seventh). "The limitations and restrictions herein contained as to dealing in, underwriting and purchasing for its own account, investment securities shall not apply to... obligations, participations, or other instruments of or issued by the Federal National Mortgage Association... or obligations or other securities which are or ever have been sold by the Federal Home Loan Mortgage Corporation..."

capital may not affect bank lending behavior. Given the recently proposed changes to Basel III, however, which will phase in higher minimum regulatory capital ratios over a number of years, examination of a capital shock when banks are near their minimum regulatory capital ratios may inform implementation of Basel III regulations.

The GSE investments and their abrupt fall in value upon the GSEs' conservatorship constitute an extraordinary natural experiment to study the relationship between bank health and lending under a period of crisis. This event allows us to examine policy decisions designed to provide financial support to failing institutions while preserving the value of stakeholders investments to the extent possible, and to analyze regulatory treatment of bank investments in securities.

Our approach shares some similarities with the bank lending literature from macroeconomics, which began with Bernanke (1983). These studies exploit variation in the amount of credit available due to changes in monetary policy (e.g., Bernanke and Blinder (1988), Kashyap and Stein (2000)), changes in capital regulation or the role of regulators (Bernanke and Lown (1991), Hancock, Laing and Wilcox (1995), and Berger and Udell (1994), Peek and Rosengren (1995), and variation from exogenous shocks to bank capital (Peek and Rosengren (2000), Ashcraft (2005), Chava and Purananadam (2008), Puri, Rochell, and Steffen (forthcoming)). Overwhelming evidence indicates that weakening bank capital positions translate into a reduction in bank credit extended to borrowers. The extent of the contraction in bank credit varies, with studies of European banks (rather than U.S. banks), and studies using loan-level (rather than bank-level) data finding the contraction to be larger.

Our study extends earlier research on bank health and bank lending by concentrating on credible identification to separate out the effects of supply side developments. As in several studies (e.g., Puri, Rochell, and Steffen (forthcoming)), Mora and Logan (2010)), we use a plausibly exogenous shock to bank capital. We first tie changes in GSE securities holdings to capital losses, and then tie these changes to bank credit. The first step in our analysis is to identify the set of banks with exposure to losses from GSE preferred stock investments. We estimate that approximately five hundred banks, or about one in fourteen of the roughly seven thousand banks in the country , held preferred stock in Fannie Mae and Freddie Mac on their balance sheets

entering into the crisis. The total exposure across banks and other depository institutions was at least $8 billion, and while a good portion of that was held by the largest institutions, community banks (banks with less than $10 billion assets) held at least $2.3 billion.

Our strategy differs from the literature on bank health and bank lending, however, in three critical ways. First, it uses an important and novel but relatively unpublicized event to examine the effect of weakened bank capital on lending. Our paper documents the adverse consequences of losses from GSE preferred shares, both on an individual bank-basis and in aggregate, following the GSEs' conservatorship. Second, our study focuses on the recent crisis; preliminary evidence suggests that the financial crisis of 2007 to 2008 led to sharp declines in new loan originations (Ivashina and Scharfstein (2009), Strahan (2009), Puri, Rochell, and Steffen (forthcoming)), much like the contraction of the early 1990s. Yet, few studies have quantified the effects of bank health, in particular, on lending over the recent crisis period, and only one other study concentrates, in particular, on U.S. banks, Berrospide and Edge (2010). Finally, our study focuses on community banks, i.e. banks under $10 billion in assets, a sector of the banking industry that has received little attention with regard to this topic. The other U.S. study, Berrospide and Edge (2010) examines lending of large bank holding companies, and finds the effects of capital on lending at large BHCs to be somewhat smaller than the effect we find at community banks.

In contrast to large BHCs, many community banks found that the sharp, sudden drop in the GSEs' preferred stock prices resulted in capital shocks from which they could not recover. We trace the failures of fifteen depository institutions (either directly or indirectly) to losses from GSE investments, and we identify another two institutions that were forced to sell themselves to other institutions in order to avoid failure. To preview our results, we find that banks with GSE exposure, and resulting drops in capital, had lower loan growth than other banks. For the banks with GSE exposure, the median drop in the ratio of Tier 1 capital to risk-weighted assets was about three percent and this translated into loan growth two percentage points below other banks on average. Observable bank characteristics do little to predict which banks invested in GSE preferred shares, supporting our assertion that this was an exogenous capital shock, but after

losing the investments, banks with those losses were 50 percent more likely to be downgraded to a weak regulatory rating than other banks.

The paper proceeds as follows. Section 2 reviews the 2008 GSE takeover event and documents the GSE investments at community banks in the U.S. Section 3 demonstrates the exogenous nature of this event to bank lending. Section 4 describes the technique we create to identify banks with large GSE preferred share holdings. Section 5 describes our empirical design and dataset, and our empirical analysis. Section 6 describes the historical trends in bank health and bank lending prior to and following recent banking crises. The final section concludes.

2. The 2008 intervention to stabilize Fannie Mae and Freddie Mac and its implications[4]

Events leading up to the conservatorship announcement

In the late summer of 2008, the GSEs were facing mounting credit losses, and their ability to raise capital was impeded by a growing lack of confidence by investors about their financial condition and an increasing uncertainty over whether the Treasury would move to seize the companies.

GSE share prices fell over the summer, and debt investors sought clarity from the federal government about whether the bondholders would be shielded from any losses that might arise (Frame, 2008). The preferred shares held their value until July, when they dropped around the time of passage of the Housing and Economic Recovery Act (HERA) that gave the Treasury broad authority to invest in the GSEs.

Altogether, the GSEs had issued a total of $36 billion in preferred stock in the recent decade. These issuances are listed in Table 1. The GSEs' then-regulator, the Office of Federal Housing Enterprise Oversight (OFHEO) had required capital to be raised following a set of well-known accounting problems that arose earlier in the decade. In addition, by the end of 2007, the GSEs were facing losses on their mortgage portfolios, and so their regulator directed them to raise

[4] For more detail on the events leading up to the intervention, see Frame (2008).

additional capital. About $22 billion of the securities were issued in 2007 and 2008, with the bulk of that being issued over a two-week period in late November and early December 2007.

On September 7, 2008, the Treasury Department and the GSEs' newly created federal regulator, the Federal Housing Finance Agency (FHFA), jointly announced that the two GSEs could not continue to operate without intervention. The GSEs were placed into the conservatorship by the FHFA, while the Treasury entered into senior preferred stock purchase agreement with each of the GSEs, initially pledging support of up to $100 billion per institution. At this time, the value of the GSEs' equity capital was positive, and so both GSEs were technically solvent, but Frame (2008) makes the compelling case that both were insolvent on an economic basis. The GSEs' reported fair values of equity were much lower than the book values, and both institutions had recorded large "deferred tax assets" (DTAs).

The result of this decision was that the claims of bondholders would be fully preserved and mortgage-backed securities obligations would remain intact, but that the dividends on common and preferred shares would be wholly eliminated, and the government would acquire a large (and increasing) stake in both of the enterprises. This action destroyed the value of the preferred stock shares. Though considerable public debate surfaced surrounding the potential adverse consequences to U.S. banks in the case of takeover of the GSEs prior to the announcement, the Treasury Department's decision resulted in an unexpectedly rapid loss of value of the GSE preferred shares. From values of around $20 to $25 a share at the end of the second quarter, the prices dropped to about $1 per share by the end of the third quarter.[5]

Many banks had invested in the preferred stock, and by the end of the fourth quarter, they were forced to write down nearly the entire value of those investments. Figure 1 illustrates the dramatic decline in share value from the end of 2007 through the announcement of the suspension of dividend payments, to the end of 2008. GSE preferred stock was an attractive investment as it offered relatively high yields with low perceived risks. These securities were rated Aa3 until the summer of 2008, when they were downgraded twice, first on July 15, 2008

[5] A last dividend payment was made at the end of the third quarter because it had been previously announced. The Treasury believed it was legally obligated to make the payments given the prior announcement.

and then again on August 22, 2008, and are currently rated junk. Prices of the GSE preferred stock declined to near zero in early September 2008. Common equity shares became essentially worthless as well. In contrast, the claims of bondholders were not written down as a result of the conservatorship.

Regulators' favorable treatment of the GSE preferred securities

Before this event, banks were allowed by regulators to invest in these preferred securities; the low perceived risk was particularly important in shaping the views of both banks and regulators. For example, the written investment policy of the National Bank of Commerce (NBC)—a small bank in Illinois with substantial GSE preferred stock investments and that failed after having its capital position devastated by the GSE takeover—stated that "while the various federal agency securities [do] not all bear the explicit guarantee of the U.S. Treasury, it is implicitly deemed unthinkable that the U.S. government would allow any of its agencies to default on outstanding debt."[6] Such beliefs were widespread.

The regulatory environment underpinning the holdings of these GSE investments by banks was supportive, particularly for banks with national charters. Few, if any, objections were raised by regulators when banks invested in GSE stock, even when the investments were large relative to their other investments. When two state-chartered subsidiaries of a bank holding company named FBOP, North Houston Bank and Madisonville State Bank, purchased substantial amounts of preferred stock in both GSEs in December 2007, the FDIC was informed and "no serious concerns regarding the securities were raised."[7] The two institutions subsequently failed after the GSEs were placed into conservatorship.

All three national banking regulators have conducted *ex post* audits of banks that failed partly due to substantial holdings of GSE preferred stock, and all have wholly exculpated the stock acquisitions. Federal Reserve System examiners "did not consider the accumulation of these

[6] Source: Department of the Treasury, *Material Loss Review of National Bank of Commerce.*

[7] Source: FDIC, *Material Loss Review of North Houston Bank, Houston, Texas, and Madisonville State Bank, Madisonville Texas*.

securities a risk."[8] Supervisors at the Office of the Comptroller of the Currency "did not express supervisory concern" over the substantial GSE investment at the Illinois-based NBC, mentioned above. An audit of that bank's supervision by the Treasury Department's Inspector General noted the following:

> One examiner stated that he would hesitate to tell a bank not to purchase GSE securities or raise a concentration concern because of the implied backing by the U.S. government. Two examiners told us that, in hindsight, it would have been a good idea to either mention the concentrations to management or require the bank to monitor its investment portfolio more closely. We accept that at the time NBC made the purchases of the GSE securities, there would have been little basis to criticize the bank given the regulatory standards and perception of minimal risk associated with these holdings. Therefore, we do not fault OCC for not taking issue with NBC's investment practices.[9]

This exoneration of responsibility is partly a function of the endorsement received by GSE securities in federal law. Normally, banks face heavy constraints against most types of equity investments, but these restrictions were lifted for GSE preferred stock. Federal legislation (12 U.S.C. §1718) allowed any bank to hold even common stock in Fannie Mae; common equity investments in particular are generally restricted sharply.[10] National banks were able to invest without limitation in the obligations of the GSEs, another departure from normal equity restrictions. In addition, for national banks, GSE preferred stock carried a 20 percent risk weighting, which is the lowest weighting outside of Treasury securities, and is an indication of the low risk that national regulators perceived these investments to pose. State chartered banks were also permitted to invest in these securities, although the required risk weighting was higher, at 100 percent. Finally, these investments were eligible for a dividends-received deduction, so that only 30 percent of the dividend income was taxable.[11]

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[8] Source: Board of Governors of the Federal Reserve System, *Material Loss Review of Midwest Bank and Trust Company.*

[9] Source: Department of the Treasury, *Material Loss Review of National Bank of Commerce.*

[10] "Notwithstanding any other provision of law, any institution, including a national bank or State member bank of the Federal Reserve System or any member of the Federal Deposit Insurance Corporation, trust company, or other banking organization, organized under any law of the United States, including the laws relating to the District of Columbia, shall be authorized to purchase shares of common stock of the corporation and to hold or dispose of such stock, subject to the provisions of this subchapter."

[11] See, for example, the description of the dividends-received deduction in the circulars for Freddie Mac preferred stock, http://www.freddiemac.com/investors/preferred_stock.html.

Some banks were exposed to GSE preferred stock through auction rate preferred stock that held the GSE investments as the underlying securities.[12] The regulations governing auction rate preferred stock were fairly permissive as well. The FDIC issued a rule that explicitly excluded auction rate preferred stock from the definition of an equity investment, thus allowing banks to avoid the usual restrictions on equity investments.[13] Otherwise, the FDIC explicitly authorized state banks to invest up to 15 percent of Tier 1 capital in such an investment without the FDIC's prior consent, stating that such an investment does not represent a significant risk to the Deposit Insurance Fund. In other cases, the FDIC consented to banks investing up to 100 percent of their Tier 1 capital in auction rate preferred stock.[14]

In short, a belief in the low risk of these securities was widespread among investors (including banks and other financial institutions) and regulators. While some investors believed these preferred shares had increased in risk in months leading up to the conservatorship, Figure 1 shows that share prices of these securities did not begin to decline precipitously until the beginning of July (within our quarter of analysis). The notion that these preferred securities were widely thought to be safe investments establishes the validity of the statistical analysis below, the central claim of which is that bank level GSE exposure is random with respect to other features of the banks that might predict loan growth. Additionally, Section 3 will provide empirical evidence of the randomness of GSE preferred stock holdings among banks.

Consequences of the Treasury/FHFA action

Criticism of the Treasury's decision has come from bankers and industry trade groups, as well as other sources.[15] After the GSEs were seized in September 2008, banking industry advocates

[12] The ABA survey referenced in footnote 25 found that 3.4% of the surveyed banks held auction rate securities backed by GSE preferred stock.

[13] This paragraph relies heavily on information gathered by the American Bankers Association. "Incentives for banks to buy Fannie Mae and Freddie Mac Stock."
http://www.aba.com/aba/pdf/gr/FannieFreddieStockIncentives.pdf

[14] A thorough review of banks 8-K filings and

[15] William Isaac, former chair of the Federal Deposit Insurance Corporation, has written that "wiping out Fannie and Freddie preferred stock was a boneheaded idea." Tom Bengston of the *Northwestern Financial Review* has written a series of articles describing the process as "a national outrage," particularly with respect to the collapse of the FBOP corporation, a $19 billion bank holding company. However, altogether there has been relatively little press coverage

were exceedingly critical about the effects on banks. In his 2010 book on financial crises, William Isaac, former Chair of the FDIC, admonished Treasury for wiping out the preferred stock holders, while the Independent Community Bankers of America (ICBA) urged Treasury to remedy the banks affected by this "rogue changing of the rules governing preferred stock contracts."[16] The American Bankers Association (ABA) similarly noted that "the elimination of all dividends on preferred shares is reducing bank capital and impeding the ability of banks to make new loans and renew existing ones."[17]

The intent of the senior preferred stock agreements was, according to Frame (2008), "to provide comfort to [the GSEs'] senior and subordinate creditors and holders of mortgage-backed securities. By extension, these actions were expected to lower and stabilize the cost of mortgage finance." [18] Yet, the decision to wipe out the preferred shareholders was not an obvious one and while considerable uncertainly surrounded the fate of the GSEs, most parties assumed up until the takeover that the preferred shareholders would be made whole.[19]

After the GSEs were placed into conservatorship, two policy actions were taken in response to concerns that community bank lending would fall as a result of losses on preferred shares. First, a tax change was implemented so that banks could use these losses to offset ordinary income, as most banks did not have any capital gains that could be offset. Second, Troubled Asset Relief Program (TARP) funding was provided to more of the GSE-exposed banks than non GSE exposed banks—about 18 percent of these banks received capital investments through TARP, compared with 10 percent of other banks. In fact, most of the 20 banks with the heaviest

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of these losses on GSE preferred stock, with little coverage in particular after the period in September 2008 durig which the losses were first announced by some banks.

[16] Letter from the ICBA to Treasury Secretary Geithner, March 12, 2010. http://www.icba.org/files/ICBASites/PDFs/ltr031210.pdf. See also the letter to Congressional officials from September 2008 (http://www.icba.org/files/ICBASites/PDFs/wsjletter091508.pdf) and from late August 2008 beseeching Treasury Secretary Paulson not to wipe out the preferred shares (http://www.icba.org/files/ICBASites/PDFs/ltr082808.pdf)

[17] Letter from the ABA to federal bank regulators, September 22, 2008, http://www.aba.com/aba/documents/press/RegulatorLetterPreferredStockSurvey.pdf. The ABA has a valuable collection of other letters and additional materials at http://www.aba.com/Industry+Issues/FannieFreddieConservatorship.htm

[18] Page 133.

[19] Paulson (2010) outlines in detail the legal and regulatory complications in resolving the two GSEs

exposure to GSE preferred stock received capital through TARP, provided they did not fail or were not absorbed by stronger institutions.

3. GSE holdings were exogenous to bank condition

Underlying our empirical analysis below is the claim that GSE holdings were random relative to other factors that may have determined bank lending. In this section, we analyze whether observable determinants of loan growth have any correlation with banks' holdings of GSE securities. While this cannot address the ultimate issue of whether unobservable determinants of loan growth have any such correlation, the absence of systematic correlation with observables suggests strongly that GSE holdings were indeed exogenous to bank condition.

In Table 2, we report the results of a probit regression, in which we predict whether or not banks held any GSE preferred securities using a set of bank and market controls. The dummy variable in this regression equals one if a banks has GSE exposure, according to our filter described in the following section, otherwise 0.

In two important dimensions, our identified GSE exposed banks look no different than other banks. First, at the beginning of 2008Q3, the GSE exposed banks were no more likely to be considered weak banks by regulators (i.e. to have a CAMELS rating of 3, 4, or 5) than other banks. Second, these banks were no more likely to have higher delinquency rates on their loan portfolios.[20] The lack of a regulatory rating difference is important, since many of the otherwise unobservable characteristics of banks may be more readily observable by examiners and incorporated into their ratings. GSE exposed banks were slightly larger than other banks, which is not surprising since many community banks hold small and conservative security portfolios. Otherwise, these banks also had fewer of their assets in loans, particularly C&I loans, and had higher leverage than other banks.

[20] Peek, Rosengren and Tootell (2009) also consider banks with CAMELS rating of 3, 4 or 5 to be in poor health. These authors shows that bank supervisory information about the risk of contagious bank failures can improve macroeconomic forecasts.

Finally, we test whether the GSE exposure impacts banks' regulatory ratings even after accounting for other variables that would predict weak ratings. Table 3 reports the results of a probit analysis in which we predict downgrades of regulatory ratings between 2008Q3 and 2009Q4 using a dummy for GSE holdings and our standard set of control variables. Since not all banks in our sample were examined between 2008Q3 and 2009Q4, we separately report results for the subset of those banks that had been examined during this period. We use two different measures of downgrades: a downgrade to a "weak" bank from a "strong bank," and any downgrade at all.

The results are presented in Table 6. The GSE exposure dummy is strongly predictive of a downgrade under any specification. The central estimates are that GSE exposed banks were 5 percentage points on average more likely to be downgraded from strong to weak, and 8 percentage points on average more likely to be downgraded at all.

4. Data on exposure to GSE preferred stock

4.1 Institutions with sizeable exposures on GSE preferred stock

Having established that the GSE preferred stock investments were considered safe and that banks' GSE holdings were exogenous to bank health, we assume that those investments should be treated as independent of other factors affecting bank activities. Given this assumption, we next identify which institutions had sizeable exposures to the preferred shares and examine their behavior after the exposure. Table 4 reports a list of financial institutions that are known to have had particularly large exposures to GSE preferred stock. The list is compiled from publicly available information, and contains the ten banks with the most exposure to GSE preferred stock (measured relative to assets in 2008Q2), along with other notable cases.

These banks faced capital adequacy issues rapidly following the September 7th event. Given the difficulty of raising additional capital in late 2008 and 2009, some of these banks subsequently failed, and others put themselves up for sale. NBC, with about $450 million in assets, became critically undercapitalized after realizing a loss of nearly $100 million on GSE preferred stock holdings, and failed in January 2009. A larger North Carolina bank, Gateway Bank & Trust Co.,

with about $2.2 billion in assets, agreed to be acquired by Hampton Roads Bankshares, Inc., after realizing a loss of about $40 million.[21]

Altogether, it appears that 15 of the banks listed in Table 4 failed (either directly or indirectly) due to GSE exposure. Of those 15 banks, 10 failed with the primary cause being GSE exposure, and 4 failed with GSE exposure contributing to but not being the sole cause. Another 2 banks put themselves up for sale immediately after losing the GSE investments, and likely would have failed otherwise.

Aside from these failures, the viability of most banks with GSE holdings was not seriously threatened, as the holdings were smaller relative to the banks' capital. The other banks listed in Table 4 also had very large exposures but all survived the shock to their capital positions. They benefited from other assistance, however, as several of the publicly held banks received capital infusions via TARP. Another privately held bank received a capital infusion from its owner.

4.2 Exposure across the banking system

While no direct measure of the exact amount of GSE preferred stock holdings across all banks is available from any public or private source, we have created a method for identifying GSE exposure, discussed in greater detail below and outlined in Appendix A.

We combine from three sources: our method which uses balance sheet data from the commercial bank Reports of Condition and Income (call reports); publicly available 8-K filings and related press releases from publicly traded commercial banks; and survey information the ICBA.[22]

Our first step in detecting GSE exposure is to filter through balance sheet data for two signs that a bank held GSE preferred stock: first, the appropriate securities category should decline from the second to third quarter of 2008, and second, a realized loss on securities holdings (reported as

[21] See, for example, the discussion of Gateway Bank in the September 8, 2008 Bloomberg.com article, "Lenders with `Outsized' GSE Stakes May Need Capital." http://www.bloomberg.com/apps/news?pid=20601087&sid=a2trGkldcuzc, access May 12, 2010.

[22] While banks are required to report securities holdings on regulatory balance sheet filings, those filings do not require information at the level of detail that would identify specific securities.

total securities) of roughly the same magnitude should also be recorded. We describe the different categories we examine in Appendix A. Our approach yields an estimate that 483 community banks held GSE preferred shares, along with 29 larger banks, for 512 banks in total.[23]

After creating our filter and compiling the list of commercial banks from the call reports that were likely to have had GSE exposure, we carefully match that list with two other sources limited to two subsamples of banks (those that are publicly listed and those that are members of the ICBA and chose to participate in a voluntary survey).[24] In comparing our approach to identifying GSE-exposed banks to these sources, we find a type II error rate of nearly zero: we flagged only one bank incorrectly as holding GSE preferred stock. We find a somewhat higher type I error rate: our filter identifies 90 percent of banks with GSE exposures.[25]

Across all banks and savings institutions, we estimate that the total investment in GSE preferred stock was *at least* $7.8 billion, out of the $36 billion in outstanding shares as of September 2008. This exposure is spread across roughly 500 banks and 100 savings institutions, or about 7 percent of those institutions.[26]

Smaller banks were more likely than larger banks to be adversely affected. Certainly, some of the largest banks in the country had exposures, but the amounts were small compared to the size of these institutions' large balance sheets. JP Morgan Chase, for example, held $1.2 billion of

[23] Publicly available information suggests that at least an additional 100 savings institutions (which include savings and loan associations, mutual savings banks, federal savings banks, and Massachusetts cooperative banks) held these investments, but the balance sheets for some of these institutions (in particular, for savings and loan associations) is much less detailed and so we do not include savings institutions in our analysis.

[24] The sources are detailed in the appendix, and include public SEC filings, and other public announcements. In addition, we are very grateful to the ICBA for the information provided to us in order to judge the accuracy of the sample.

[25] We have identified a good proportion of the banks that misreported, as they had reported the holdings incorrectly as "other debt" rather than "other equity" as instructed by bank examiners. A number of banks also reported the losses as text items under extraordinary losses rather than realized losses on securities. Although we do not capture every bank that held GSE preferred securities, those banks that held GSE preferred securities but which are not identified by this process would bias our estimates through measurement error. This bias would move the estimated coefficient toward zero, attenuating the estimated effect of the loss in GSE investments on bank lending.

[26] We believe our estimate to be conservative, as described below and in the appendix, and so it is not surprising that the estimate is comparable but a little below other estimates that have been made by the ABA and ICBA. The ABA estimated that 27 percent of banks were exposed to a total of $10 to $15 billion. The ICBA estimated that $15 to $20 billion of the GSE preferred stock was held in the banking the system.

these GSE investments, while Wells Fargo held $480 million.[27] The investments were more likely to be large relative to the portfolios of the smaller community banks that had invested in them, and the subsequent shocks to their capital more impactful.

Throughout the rest of the paper, we therefore focus only on community commercial banks. We define community banks as those with less than $10 billion in assets, and those not within bank holding companies whose consolidated balance sheets contain more than $10 billion in assets. The resulting data set contains 6947 banks out of the 7183 total banks in 2008Q3. (This number declines in subsequent quarters due to failures and mergers.) We also split out the banks under $1 billion in assets and those in bank holding companies whose consolidated balance sheets are less than $1 billion in assets. We focus on the set of community banks in order to maintain a homogenous sample. As a set, the business practices of the community banks are fairly similar, relative to the largest banks, which have more diverse and complicated asset and liability strategies. Moreover, the securities holdings of the larger banks can be much more volatile; this makes identifying their holdings of GSE securities more difficult, and also raises the possibility that the larger banks would react differently to the shock.

Finally, for most of the paper, when examining the impact of GSE exposure, we use a dummy variable indicating GSE exposure rather than a continuous measure. The strength of our methodology is in its ability to identify exposure, but it does not necessarily yield an accurate dollar estimate of the exposure, since the estimates from balance sheets can be affected by other changes in balance sheet items.

5. Impact on Bank Health and Bank Lending

5.1 A look at the most exposed banks

To understand the pattern of loan growth and other balance sheet developments at GSE exposed banks after 2008Q3, we first examine in detail the banks with sizeable exposures. Table 5 adds detailed information to the previously discussed Table 4 on changes in banks' balance sheets

[27] Two savings and loan associations, not included in our sample for reasons described above, also suffered considerable losses from these investments. The largest savings and loan in the country, Washington Mutual, held $282 million, and the second largest savings and loan, Sovereign Bancorp Inc., held $623 million.

around the time the GSEs were seized. For each bank listed in this table, we calculate its percentile in the industry's loan growth distribution in a given quarter, so that a figure of 50 for 2008Q2 means that half of community banks had higher loan growth in that quarter, and a figure of 1 would mean that 99 percent of banks had higher loan growth. In 2008Q2, this small set of banks appears to be no different than the rest of US commercial banks: their loan growth averages at the 53rd percentile. We do the analogous calculation for changes in the ratio of Tier 1 capital to risk weighted assets, and again find these banks—in the 49th percentile—to be indistinguishable from the set of all community banks.

In 2008Q3, the banks exposed to GSE preferred shares took immediate and substantial charges to their measured capital. Together, these banks average at the 6th percentile of all banks as ranked by the change in their capital ratio. Loan growth in 2008Q3 does not respond much, but since the losses occurred in mid-September, banks did not have adequate opportunity to adjust their loan portfolios before the September 30th call report deadline. By 2008Q4, however, these banks average only at the 30th percentile of banks as ordered by loan growth. At the same time, the banks appeared to have raised needed capital, as they are slightly above the median bank in 2008Q4 when ordered by the change in their capital ratio.

5.2 Impact on Capital

The immediate impact of exposure to the GSE securities was a decline in capital at the affected banks. As Table 5 illustrates, GSE exposed banks were more likely to have experienced declines in their ratios of Tier 1 capital to risk-weighted assets (Tier 1 capital ratio) in 2008Q3.[28] While the table is instructive, we next examine whether capital changes at GSE exposed banks reflect systematic differences in other quarters. To that end, we run a set of twelve regressions, separately for each quarter from 2007Q1 to 2009Q4. The analysis for each quarter is a simple

[28] We focus here and in most of the remainder of the paper on the Tier 1 capital ratio. For definitions of capital adequacy in the U.S., refer to http://edocket.access.gpo.gov/cfr_2003/pdf/12cfr6.4.pdf. A bank's capital adequacy is measured by three metrics: the total risk-based capital ratio, the Tier 1 capital ratio and the leverage ratio and, generally, it must meet the threshold for each of those measures for each category of capital adequacy. The capital categories are as follows: well capitalized, adequately capitalized, undercapitalized, significantly undercapitalized, and critically undercapitalized. In addition to having a total risk-based capital ratio of 10 percent or higher and a leverage ratio of 4 percent or higher, a bank is considered well-capitalized if its Tier 1 capital ratio is 6 percent or higher. For a decline of one percentage point in all three ratios, a banks' capital adequacy drops down one notch (from well capitalized to adequately capitalized, for example).

univariate OLS model, with the dependent variable being the percent change in the Tier 1 capital ratio from the previous quarter (*Δcap*) and the independent variable being a dummy indicating exposure to GSE preferred stock (*GSE dummy*).[29] Our capital ratio regressions have the following structure:

$$\Delta cap_{it} = \alpha + \beta \cdot GSE\ dummy_{it} + \varepsilon_{it}$$
$$for\ t = quarters\ between\ 2007Q1\ and\ 2009Q4, \qquad (1)$$

where *i* is an index across banks, and t is an index across quarters. We use robust standard errors.

e estimate equation (1) separately for each quarter and report the results in graphical form in Figure 2, displaying the 95 percent confidence interval in each quarter for the coefficient on GSE preferred stock. The date of the GSE takeover is identified by a vertical line.

In the quarters prior to 2008Q3, the changes in the Tier 1 capital ratio at banks with GSE exposure versus at other banks are not significantly different from zero. There is a small increase, though, in 2008Q2, just prior to the GSE crisis, which is likely due to preemptive capital raising given the increasing trepidation about the GSE investments in July 2008.

The coefficient on GSE exposure in Figure 2 falls dramatically in the third quarter of 2008, and the average percent change observed in the measured Tier 1 capital ratio is about three percentage points lower than the average percent change at non-exposed banks. While an economically modest decline in capital, the difference in measured quarter-end capital ratios may understate the actual average capital shock incurred, since banks could have taken steps to improve their capital positions, by restricting dividends, for example.

In the quarters following 2008Q4, the GSE-exposed banks have average Tier 1 capital ratio changes that are slightly above other banks, as the exposed banks acted to raise capital following the shock during the third quarter. Given the stresses in the banking industry (discussed in the first section), raising capital quickly was presumably relatively difficult. In addition, banks

[29] Given the nature of banking data, there are extreme observations in each quarter as banks change their capital positions dramatically for various reasons. We trim the top and bottom 1% of the observations in each quarter, as arranged by the change in the capital ratio.

without GSE exposure may have been affected by negative shocks in the following quarters that the GSE banks were not exposed to, driving down their relative changes in capital positions. The GSE banks may have been insulated from shocks in subsequent quarters, where banks' portfolios had been dominated by GSE securities, crowding out other possible investments.

5.3 Impact on Loan Growth

To address the impact of GSE investments on loan growth from 2008Q3 to 2008Q4, we next test how the annualized quarter-to-quarter loan growth (g) varies with holdings of GSE securities.[30] Our baseline loan growth regression has the following structure:

$$g_i = \alpha + \beta \cdot GSE\ dummy_i + \delta_1 \cdot Cap2008Q2_i + \delta_2 \cdot Cap2008Q2_i \cdot GSE\ dummy_i + bank_{controls_i}'\eta + market\_controls_i'\kappa + \varepsilon_i \quad (2)$$

In this equation, *g* is annualized loan growth from 2008Q3 to 2008Q4, *Cap2008Q2* is the tier 1 capital ratio at the end of 2008Q2, *bank_controls* and *market_controls* are vectors of control variables which will be discussed below, and *i* indexes banks. The *GSE dummy,* as defined above, is an indicator variable that equals one if the bank held GSE preferred securities, otherwise zero. We estimate this equation with and without the term that interacts the capital ratio with the GSE dummy; this term would indicates whether GSE-exposed banks with high capital ratios responded differently than GSE-exposed banks with lower capital ratios.

We also report another specification that pools data from the eight quarters over 2007 and 2008. To isolate the effect of GSE preferred stock exposure, we introduce a dummy for fourth quarter of 2008, and interact that with the GSE exposure dummy. We also interact the lagged capital ratio with the 2008Q4 dummy in the following manner to capture the way in which loan growth differed with GSE exposure in 2008Q4 differently than in previous quarters and differently across initial capital positions:

[30] Similar to the analysis of capital, we trim the top 5% and bottom 2% of banks according to their loan growth in each quarter, in order to remove the inevitable outliers from this volatile variable. The larger trim at the top is due to the very long upper tail of the loan growth distribution. We obtain similar results with a trim of 2% on each end, but find that with trims smaller than that the volatility of the data has a much greater impact. The growth rates are also adjusted for merger activity.

$$g_{it} = a + \beta_1 \cdot GSE\ dummy_i + \beta_2 \cdot GSE\ dummy_i \cdot 1(2008Q4)$$
$$+ \theta_1 \cdot GSE\ dummy_i \cdot Cap_{i,t} \cdot 1(2008Q4) + \theta_2 \cdot GSE\ dummy_i \cdot Cap_{i,t}$$
$$+\theta_3 \cdot Cap_{i,t} + bank\_controls_{it}'\eta$$
$$+ market\_controls_{it}'\kappa + \varepsilon_{it} \qquad (3)$$

The *2008Q4dummy* is an indicator marking the quarter following the GSE takeover, *Cap2008Q4* is the Tier 1 capital ratio as of 2008Q4.

We include a large number of control variables in our reported specifications. Following Berger and Bouwman (2010), we include controls for bank size, bank risk, bank holding company (BHC) membership, and local market power and profitability. For bank size, we include the log of total assets for each bank and for bank risk we include the banks' CAMELS rating as of the beginning of 2008Q3. BHC membership (BHC dummy equals one if the bank is a member of a BHC, otherwise 0) is important because the source of strength doctrine requires the holding company to support all banks it owns as necessary and it may also voluntarily inject liquidity into the bank when needed (Berger and Bouwman, 2010). We include a number of additional controls that Francis (2010) finds can explain a significant share of bank failures in the recent crisis period, such as measures of asset quality, management competency and liquidity.[31] For asset quality, we use the overall loan delinquency rate. Management quality (or competency in business strategy and investment decisions) is proxied by several measures of the composition of banks' asset portfolios, such as the concentration of assets in loans and the characteristics of the loan portfolio, that is, the shares of total loans in consumer, residential real estate and commercial real estate (Francis, 2010). We also include, as an alternate to the concentration in commercial real estate, the ratio of CRE loans to equity since concentration in this type of real estate will trigger certain regulatory actions .[32] Liquidity measures include the ratio of securities holdings to assets (Kashyap and Stein, 2000 and Francis 2010) and the ratio of deposits to

[31] The author finds that measures of capital adequacy and profitability (which we include) also explain failures. These measures (listed with the Bouwman and Berger measures) are also included.

[32] Separately, we also included indicator of whether the CRE to equity ratio exceeded 300 percent, because this measure was the subject of particular focus by examiners during this period, and that threshold triggered certain regulatory actions. See, for example, FDIC Financial Institution Letters FIL-22-2008 on "Managing Commercial Real Estate Concentrations in a Challenging Environment," accessed July 29, 2010 at (http://www.fdic.gov/news/news/financial/2008/fil08022.html#_ftn1). However, we find that it does not have any explanatory power in our loan growth regressions.

assets.[33] We also include a measure of how important nontraditional activities are by including the ratio of noninterest income to the sum of total interest and noninterest income, as in Peek and Rosengren (1993, 1995).

The regression results for equation (2) are reported in Table 6. On average, banks with GSE exposure recorded loan growth almost two percentage points lower than other banks. Without any control variables, the estimate is slightly bigger at about two and a half percentage points. In order to gauge the economic significance of this result, it is worth comparing this impact on loan growth with the magnitude of the changes in capital caused by the investment shock. In the previous section, we saw that GSE exposed banks on average experienced a change in their Tier 1 capital ratios that was about two percentage points below other banks.

We might expect that banks with more vulnerable capital positions entering into September 2008 to be more likely to react negatively to a capital shock. With this in mind, in the second column of Table 6, we interact the GSE exposure dummy with each bank's capital position as of the 2008Q2.[34] The capital ratio itself has a positive coefficient of about 28, indicating that a one percentage point increase in the capital ratio is associated with loan growth about one quarter of a percentage point higher. In this specification, the coefficient on the GSE exposure dummy is larger than in the first column, at about negative five percentage points, while the interaction term is about twenty-four percentage points, though only statistically significant with 90 percent confidence. To bring these results together, consider the example of a bank with a capital ratio of 0.095 (about the 10th percentile). The impact of the GSE exposure for such a bank would be expected to be about negative 2.2 percentage points (-4.9 + 28*0.095). For a bank with a capital ratio of about 0.13 (the 50th percentile), the expected impact of GSE exposure would again be about negative 1.2 percentage points (-4.9+28*0.13), similar to the estimate from the first column.

If the differences we observe in loan growth are unique to the period after the GSE takeover, rather than reflecting general differences between GSE exposed banks and other banks, then we

[33] Francis (2010) uses noncore funding to total loans and investments.

[34] A few banks have very large outlying capital ratios. As a result, we constrain the sample to banks with a capital ratio below 100%.

would find no difference in lending in other quarters prior to 2008Q4. In column (3), we use the panel of data from 2007Q1 to 2008Q4, and interact the GSE dummy with a dummy indicating that the date is 2008Q4. The estimation also includes dummy variables for each quarter, as well as the same set of controls.[35] We also interact this with the capital ratio in each quarter. The results are similar: having GSE exposure has no general effect on lending, but it does have an effect in 2008Q4, lowering loan growth at community banks by about 5.5 to 7.5 percentage points.

Finally, as an additional robustness check, in Figure 3 we repeat the cross-sectional regression from the second column of Table 6 twelve times, separately for each quarter between 2007Q1 and 2009Q4. We report the results for a bank with the median capital ratio as of 2008Q2. As shown earlier, because GSE exposed banks were no different than other banks except for their GSE exposure, we expect to see a deviation in loan growth rate between the two groups of banks starting around the crisis, which is indeed what we find. Prior to 2008Q3, there are generally no statistically significant differences between GSE exposed banks and other banks with regards to loan growth.[36] The point estimate on the GSE dummy does bounce around a bit but is not statistically significant. From 2008Q3 onwards, the point estimate on the GSE dummy is negative, and statistically different from zero in 2008Q4, 2009Q1, and 2009Q3. In Figure 4, we repeat the same exercise but calibrate the response for a bank with a low capital ratio as of 2008Q2, at the tenth percentile of the distribution. The results are similar, but we find that the initial impact is a bit stronger in 2008Q4, and the effect remains statistically significant for one additional quarter, in 2009Q1.

On an aggregate basis, we suggest the following back of the envelope estimate for the total reduction of lending in 2008Q4. The set of community banks that incurred about $2 billion in

[35] The CAMELS rating in the reported results is fixed for the 2008Q3 rating. The results are not affected by using the contemporaneous CAMELS rating.

[36] Depending on the specification, at times there is a larger than normal difference in loan growth rates in 2007Q4, though not statistically significant from zero by conventional thresholds. This may be due to the fact that many of the banks with GSE investments made those investments during 2007Q4, when the GSEs issued large amounts of their preferred stock. Such banks may have had less money available for other investments. This small difference disappears by 2008Q2 however. In addition, the difference appears to be caused by very high growth rates (in the 96+ percentiles) at banks without GSE exposure.

GSE-related losses held roughly $200 billion in loans at the end of 2008Q3. If each bank reduced loan growth by 2 percentage points, an estimate for the aggregate lending drop among these banks would be roughly $4 billion.

7. Conclusion

GSE preferred stock was widely held across community banks entering into the fall of 2008, with regulators' knowledge and support. Fifteen institutions failed directly or indirectly as a result of the investment losses, and two more institutions were forced to put themselves up for sale. The total losses from these investments, across all US commercial banks and other depository institutions, are estimated to have been at least $8 billion.

At the community banks with the largest exposures to the GSE preferred shares, loan growth fell sharply compared to other banks. While these banks averaged at around the 50th percentile in terms of the loan growth distribution in 2008Q2, they fell to about the 30th percentile in 2008Q4. For a more rigorous and comprehensive analysis, we compile a list of all banks that we believe were exposed to the GSE preferred shares. We estimate that a considerable number of banks—roughly one out of every fourteen in the country—suffered losses from this source. After suffering large shocks to their measured capital positions, banks with exposure to these investments had loan growth significantly below the growth observed at other banks in the following period. Against the backdrop of the historic declines in bank lending that followed the 2007-2009 financial crisis, this paper may be viewed as a detailed examination of an extraordinary shock to bank capital during the crisis contributing to those developments.

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Appendix 1: Method for detecting GSE exposure

As described in the main text, we use call report information to compile a list of banks considered to have held GSE securities, and confirm the accuracy of our method by comparing the results for banks that have publicly available information on their holdings. We detail that process in this appendix.

In quarterly balance sheet filings, the GSE preferred stock securities should have been categorized as "other equity", but some banks categorized them as "other domestic debt" by mistake.[37]

In order to be flagged as a suspected holder of GSE preferred stock, a bank must have

1. recorded a net realized loss (NRL) on available-for-sale securities holdings of at least $100 thousand over 2008Q3, and a recorded a drop in "other equities" or "other domestic debt" of at least $100 thousand,[38]

2. and *either*

a) the drop in securities must be no more than 20 percent different than the NRL.

or

b) the drop in securities must be by at least 75 percent, and the drop must be no more than 50 percent different than the NRL.

In other words, the filter requires that the decline in the value of securities be fairly close to the net realized loss, and if not, the drop must be very large and still reasonably close to the net realized loss. We have also looked at a "stricter" version of this filter that uses only banks identified through 2(a), and find very similar results which we report at the end of this appendix.

Of the 6947 community banks existing in 2008Q3, this process suggests that 455 held GSE preferred stock. Along with 29 larger banks that we know held these securities from public information, and 28 banks not identified by this methodology, we reach our total estimate that 512 banks held GSE preferred stock.
Of these 483 banks, roughly three quarters are flagged because of their holdings of "other equity," and the other one quarter of banks are flagged because of their holdings of "other

[37] After the GSE losses made the errors apparent, the instructions were changed to clarify the appropriate category for GSE preferred stock, but this does not change the historical data. The full name of the "other equity" category is "investments in mutual funds and other equity securities with readily determinable fair values." This category consists of items RCFDA510 and RCFDA511 for book value and fair value. There are only available-for-sale securities in this category and no hold-to-maturity items. We shorten the name to "other equity" for convenience. The "other domestic debt" category includes items RCFDA1739 and RCFD1741, which are the book and fair values for available-for-sale securities in this category. We use book value for these calculations.

[38] A small number of banks reported the loss from the writedowns of these securities as extraordinary expenses rather than as realized losses. We adjust for this, as the extraordinary expenses have written explanations that identify which banks did this.

domestic debt." This strategy is less appropriate for larger banks, whose securities holdings are more complicated. This is largely not a concern, though, as any publicly held larger banks with exposures reported that information publicly through filings with the SEC.

This strategy has two risks. First, banks with GSE holdings may not be identified (a type I error), which may occur if the banks fail to record the loss properly (by not recording a realized loss, for example) or if the banks have offsetting actions with other securities that obscure the writedown of the GSE securities. Second, banks without GSE holdings may be improperly flagged (a type II error), which may occur if the banks happen to realize a loss on a different "other equity" or "other domestic debt" security in the same quarter or if the banks have other more complicated securities transactions.

To verify the success of our filter, we examine the ability of the filter to correctly identify banks that we know (from a few sources, noted below) held GSE preferred stock, as well as its ability to *not* flag banks which we known did not hold GSE preferred stock.

We use three sources of information on GSE holdings for this exercise. First, the Independent Community Bankers of America (ICBA) surveyed its members shortly after September 2008, asking whether each held the GSE securities; the ICBA generously shared the list of banks answering affirmatively, on a confidential basis. While the survey did not necessarily capture a representative sample of banks, it provides a valuable source of information for verifying our filter. Second, many publicly held banks filed disclosures with the SEC through 8-k filings in the period immediately after the GSE conservatorship, announcing either that they were or were not exposed to losses from the GSE preferred stock. We conducted a thorough search of 8-k filings between 9/1/2008 and 10/31/2008 for any banks mentioning key words about the GSEs or preferred stocks. Finally, we gathered information from additional banks that announced their exposure (or lack of exposure) through other public press releases or press coverage.

From these sources, we have gathered a list of 184 community banks that we know had exposure to GSE preferred stock, and 89 banks that we know did not have any exposure. The rate of false positives is nearly zero: only 1 bank of the 89 was incorrectly flagged as holding GSE stock. The rate of false negatives is somewhat more elevated: our filter correctly identified 156 of the 184 banks, or about 85 percent.

The majority of the type I errors involved irregularities of accounting or bookkeeping on the part of the banks. Many of these banks waited until Q4 to either write down the securities or to realize a loss on their income statements. A small number of banks were not identified simply because their fall in securities holding did not match very well their net realized losses. Altogether, though, the likelihood that we have not identified any banks that had large exposures to GSE stock is small, because such banks would probably have reported their holdings via an 8-k filing or to the public in some other way. In the analysis of the paper, we use all of the information from these ancillary sources; that is, if our filter was unsuccessful at classifying a bank based on the public information, we reclassify those banks for the purpose of the analysis.

Finally, tables A-1 to A-3 display the results of a few robustness exercises. In Table A-1, we display the number of banks that would be considered GSE exposed banks if we were to apply our selection method to quarters outside of 2008Q3. In the quarters leading up to the crisis, the number of such banks is small – less than 50 in some quarters and less than 10 in other quarters. Taken together with the evidence already presented, we believe our robustness exercises confirm that the number of banks that we may have mistakenly classified as having exposure to GSE preferred shares is small.

Table A-2 displays the aggregated holdings of "other equity" and "other domestic debt" at banks that were flagged because of their holdings of each, and at other banks. Total holdings of "other equity" in 2008Q2 at these banks were $5.8 billion. Of this, $2.0 billion were at banks suspected of holding GSE stock, and they were left with only $324 million in this category at the end of the next quarter. Less exposure is estimated to have occurred through the "other domestic debt" category. All community banks held about $11.4 billion in this category in 2008Q2, but only $968 million at banks suspected of holding GSE stock in this category. Those banks were left with $438 million in that category at the end of the third quarter. This table shows the effectiveness of our filter: there is a dramatic decline in the holdings of these securities at banks we believe were exposed to GSE securities but in the holdings at the other banks it is relatively stable.

Lastly, Table A-3 displays the loan growth results using the "strict" method described above that only counts banks that satisfy 2(a). The results are very similar but the coefficients are a bit smaller.

Appendix 2: **Materials on the GSE Preferred Stock**

Industry Groups

The American Bankers Association (ABA) has a large amount of material on its website, in a section titled "Industry Issues: Fannie Mae & Freddie Mac Conservatorship." The materials include letters written by the ABA on the subject, summaries of federal regulationhttp://www.aba.com/Industry+Issues/FannieFreddieConservatorship.htm

The Independent Community Bankers Association (ICBA) has several letters written to federal regulators and other federal bodies. Of particular interest is a survey the ICBA conducted of its members regarding their GSE exposure. See in particular the following sites:

All documents relating to the GSEs:
http://www.icba.org/advocacy/policyissuecategory.cfm?IssueID=111&ListID=3987&catName=GSEs&sn.ItemNumber=1710
ICBA advocacy statement:
http://www.icba.org/advocacy/index.cfm?ItemNumber=48715
Letter to Secretary Geithner:
http://www.icba.org/files/ICBASites/PDFs/ltr031210.pdf
Letter to Chairman Kanjorski:
http://www.icba.org/files/ICBASites/PDFs/ltr060209.pdf
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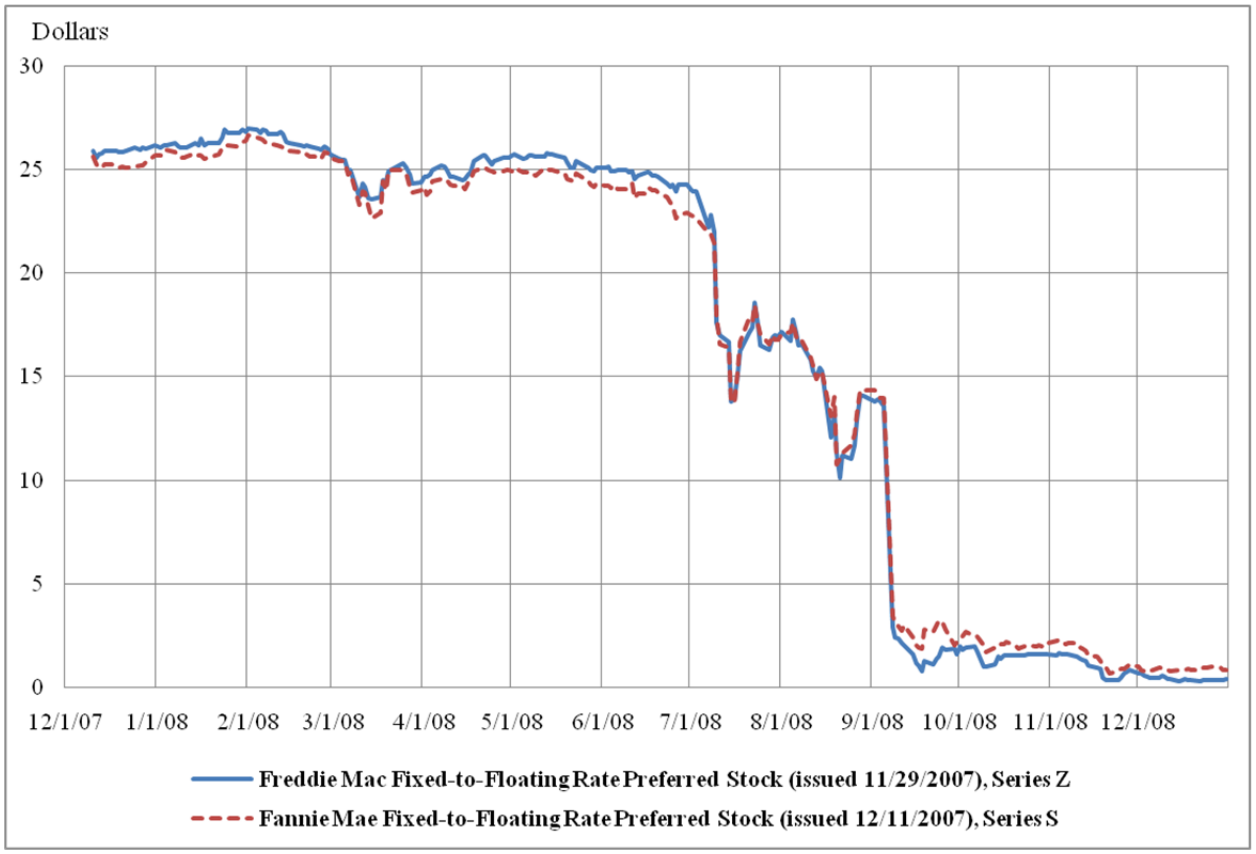
Federal Regulations

The ABA has a useful guide on the incentives for banks to purchase GSE preferred stock: http://www.aba.com/aba/pdf/gr/FannieFreddieStockIncentives.pdf

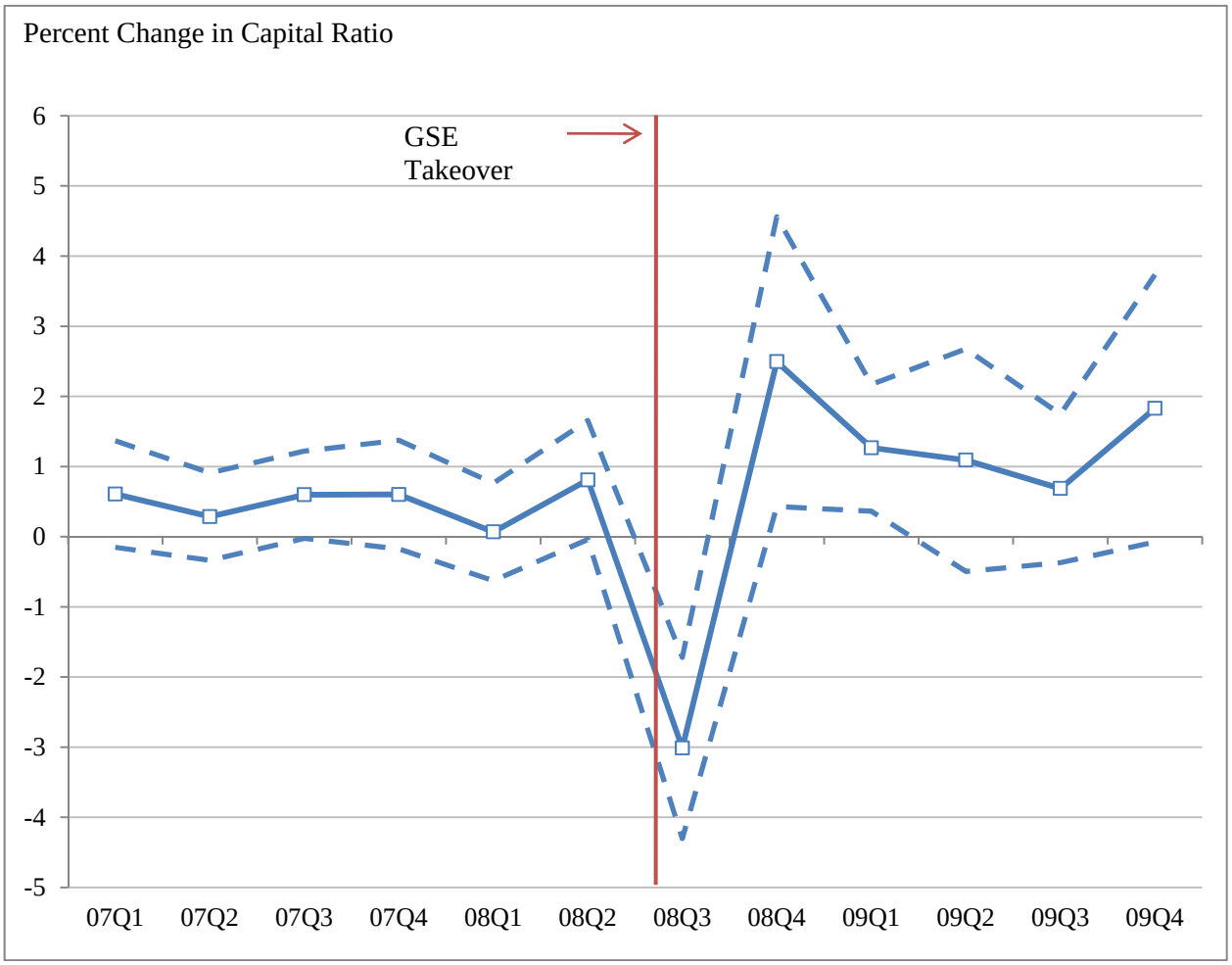
Federal bank regulators issued an "Interagency Statement on the Regulatory Capital Impact of Losses on Fannie Mae and Freddie Mac Preferred Stock," October 24, 2008. http://www.ots.treas.gov/_files/481135.pdf

Figure 1: Value of Selected GSE Preferred Stocks: December 2007 – December 2008



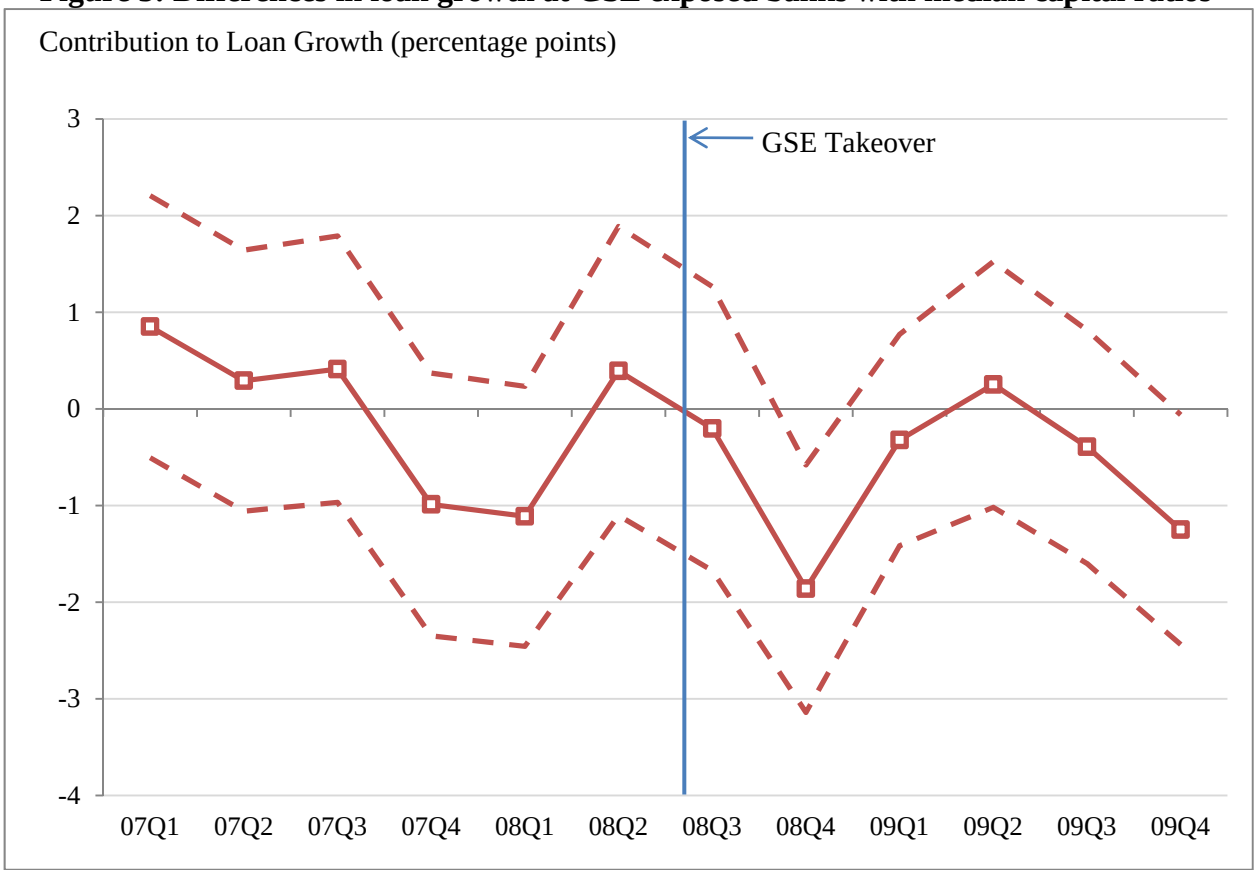
Notes: This figure illustrates the dramatic decline in share value from the end of 2007 through the announcement of the suspension of dividend payments, to the end of 2008. The blue line represents the value of the Freddie Mac series Z preferred shares, while the dotted red line represents the Fannie Mae series S preferred shares. *Source:* Bloomberg.

Figure 2: Capital changes at GSE exposed banks over time



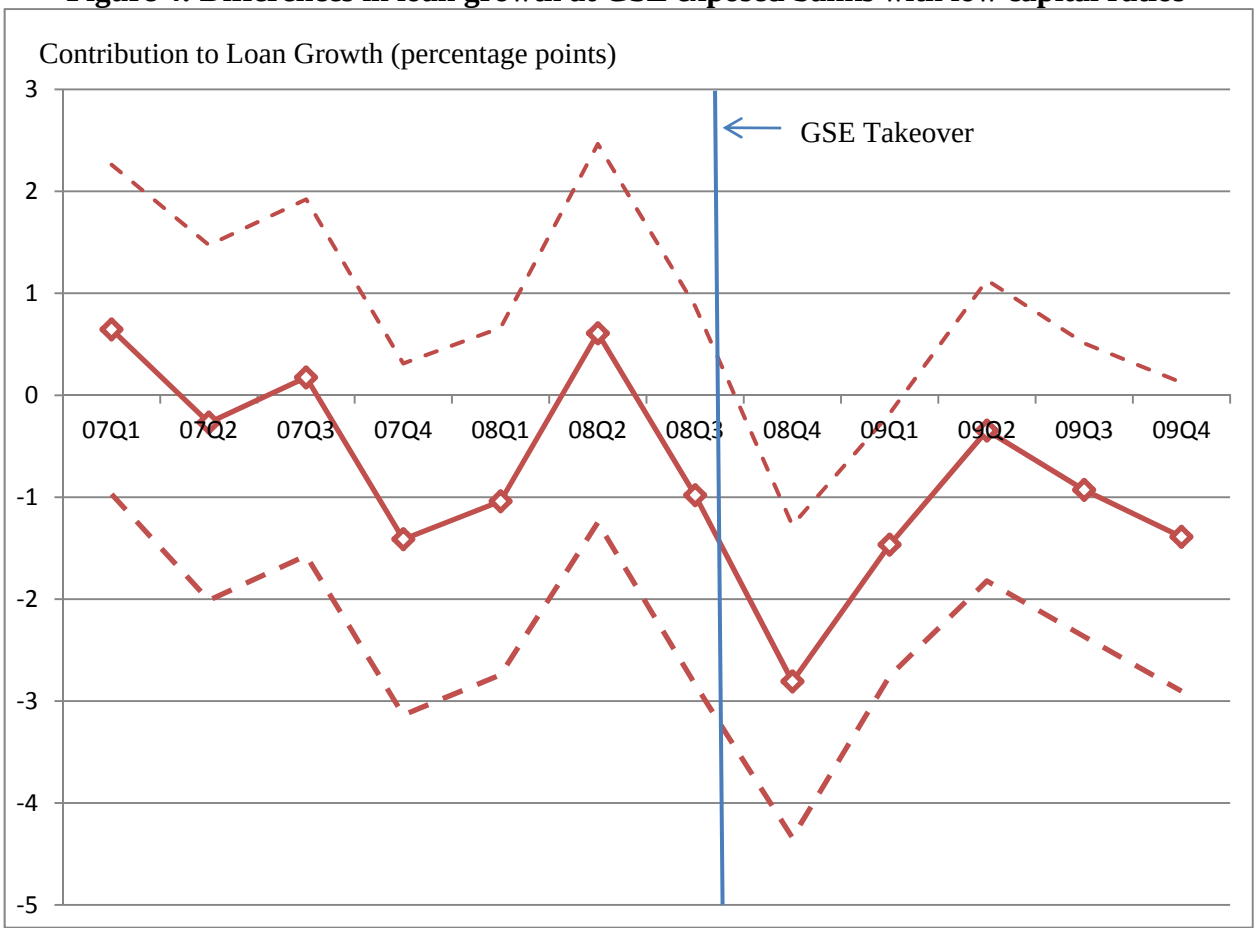
Notes: Pictured are the results of 12 regressions for each quarter between 2007Q1 and 2009Q4. The analysis is a simple OLS regression of the change in the capital ratio on a GSE dummy. The capital ratio is Tier 1 capital over risk weighted assets, multiplied by 100. Pictured are the point estimates on the GSE dummy with 95 percent confidence intervals, using robust standard errors.

Figure 3: Differences in loan growth at GSE exposed banks with median capital ratios



Notes: Pictured are the estimates from 12 regressions for each quarter between 2007Q1 and 2009Q4, of loan growth from the previous quarter on a dummy for GSE exposure along with the set of control variables described in the text. The graphic depicts the point estimates on the GSE dummy plus the median capital ratio times the coefficient on the GSE dummy interacted with the lagged capital ratio, along with 95percent confidence intervals

Figure 4: Differences in loan growth at GSE exposed banks with low capital ratios



Notes: Pictured are the estimates from 12 regressions for each quarter between 2007Q1 and 2009Q4, of loan growth from the previous quarter on a dummy for GSE exposure along with the set of control variables described in the text. The graphic depicts the point estimates on the GSE dummy plus the capital ratio at the 10th percentile times the coefficients on the GSE dummy interacted with the lagged capital ratio, along with 95 percent confidence intervals

Table 1: GSE Preferred Stock Issuances

Panel A: Fannie Mae

Issue Date	Preferred Stock Description	CUSIP	Total Amount of Issue ($)	Coupon
9/30/1998	5.25% Non-Cumulative Preferred Stock, Series D	313586505	150,000,000	5.25
4/15/1999	5.10% Non-Cumulative Preferred Stock, Series E	313586604	150,000,000	5.1
3/20/2000	Variable Rate Non-Cumulative Preferred Stock, Series F	313586703	690,000,000	0
8/8/2000	Variable Rate Non-Cumulative Preferred Stock, Series G	313586802	287,500,000	0
4/6/2001	5.81% Non-Cumulative Preferred Stock, Series H	313586885	400,000,000	5.81
10/28/2002	5.375% Non-Cumulative Preferred Stock, Series I	313586877	300,000,000	5.375
4/29/2003	5.125% Non-Cumulative Preferred Stock, Series L	313586844	345,000,000	5.125
6/10/2003	4.75% Non-Cumulative Preferred Stock, Series M	313586836	460,000,000	4.75
9/25/2003	5.50% Non-Cumulative Preferred Stock, Series N	313586828	225,000,000	5.5
12/30/2004	Variable Rate Non-Cumulative Preferred Stock, Series O	313586794	2,500,000,000	0
12/30/2004	5.375% Non-Cumulative Convertible Series 2004-1 Preferred Stock	313586810	2,500,000,000	5.375
9/28/2007	Variable Rate Non-Cumulative Preferred Stock, Series P	313586786	1,000,000,000	4.5
10/4/2007	6.75% Non-Cumulative Preferred Stock, Series Q	313586778	375,000,000	6.75
11/21/2007	7.625% Non-Cumulative Preferred Stock, Series R	313586760	530,000,000	7.625
12/11/2007	Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series S	313586752	7,000,000,000	8.25
5/14/2008	Non-Cumulative Convertible Preferred Stock, Series 2008-1	313586745	2,587,500,000	8.75
5/19/2008	8.25% Non-Cumulative Preferred Stock, Series T	313586737	2,225,000,000	8.25
	Total amount issued ($)		21,725,000,000	
	Of which, outstanding as of June 2010 ($)		20,629,398,600	

Table 1: GSE Preferred Stock Issuances (continued)

Panel B: Freddie Mac

Issue Date	Preferred Stock Description	CUSIP	Total Amount of Issue ($)	Coupon
4/23/1996	Variable-Rate Preferred Stock Offering, Series B	313400608	250,000,000	0
10/21/1997	5.81% Preferred Stock Offering	313400889	150,000,000	5.81
3/18/1998	5% Preferred Stock Offering, Series F	313400863	400,000,000	5
9/18/1998	Variable-Rate Preferred Stock Offering, Series G	313400848	219,750,000	0
9/18/1998	5.1% Preferred Stock Offering, Series H	313400855	400,000,000	5.1
10/23/1998	5.3% Preferred Stock Offering	313400822	200,000,000	5.3
3/15/1999	5.1% Preferred Stock Offering	313400814	150,000,000	5.1
7/16/1999	5.79% Preferred Stock Offering, Series K	313400830	250,000,000	5.79
11/2/1999	Variable-Rate Preferred Stock Offering , Series L	313400798	287,500,000	0
1/23/2001	Variable-Rate Preferred Stock Offering, Series M	313400780	325,000,000	0.94
3/20/2001	Variable-Rate And 5.81% Preferred Stock Offering, Series N	313400764	230,000,000	0.71469
3/20/2001	Variable-Rate And 5.81% Preferred Stock Offering, Series O	313400772	172,500,000	5.81
5/23/2001	Variable-Rate And 6% Preferred Stock Offering, Series Q	313400756	201,250,000	0
5/23/2001	Variable-Rate And 6% Preferred Stock Offering, Series P	313400749	172,500,000	6
10/25/2001	5.7% Preferred Stock Offering, Series R	313400731	300,000,000	5.7
1/24/2002	5.81% Preferred Stock Offering	313400723	300,000,000	5.81
7/12/2006	Variable-Rate and 6.42% Preferred Stock Offering, Series T	313400699	250,000,000	6.42
7/12/2006	Variable-Rate and 6.42% Preferred Stock Offering, Series S	313400715	750,000,000	4
10/11/2006	5.9% Preferred Stock Offering, Series U	313400681	500,000,000	5.9
1/10/2007	5.57% Preferred Stock Offering, Series V	313400673	1,100,000,000	5.57
4/10/2007	5.66% Preferred Stock Offering, Series W	313400665	500,000,000	5.66
7/17/2007	6.02% Preferred Stock Offering, Series X	313400657	500,000,000	6.02
9/24/2007	6.55% Preferred Stock Offering, Series Y	313400640	500,000,000	6.55
11/29/2007	Fixed-to-Floating Rate Preferred Stock Offering, Series Z	313400624	6,000,000,000	8.375
	Total amount issued ($)		14,108,500,000	
	Of which, outstanding as of June 2010 ($)		14,108,500,000	

Source: Bloomberg

Table 2: Determinants of GSE exposure

Dependent variable: dummy indicating a bank held GSE preferred stock		
	Probit	Probit
Sample	All	All
Date	2008Q2	2009Q4
Weak 2008Q3	0.00604	0.00941
	(0.00963)	(0.0104)
Loan Delinquency Rate	-0.0303	0.0427
	(0.0777)	(0.0597)
C&I Loans / All Loans	-0.107***	-0.101***
	(0.0337)	(0.0377)
Residential RE Loans / All Loans	0.0207	0.0393
	(0.0244)	(0.0251)
CLD Loans / All Loans	-0.0140	-0.0360
	(0.0309)	(0.0440)
Farm Loans / All Loans	-0.0685*	-0.0387
	(0.0373)	(0.0382)
Loans / Assets	-0.0699***	-0.0360*
	(0.0194)	(0.0205)
Deposits / Assets	-0.0224	-0.0266
	(0.0249)	(0.0285)
CRE/Equity	-0.00497*	-0.00112
	(0.00294)	(0.00256)
1(CRE/Equity>3)	0.00958	-0.00327
	(0.00937)	(0.00824)
log(Assets)	0.0357***	0.0329***
	(0.00246)	(0.00258)
Tarp recipient dummy		0.0215**
		(0.0107)
Three bank deposit concentration	-0.00593	0.00517
	(0.0125)	(0.0131)
Observations	6905	6506
Pseudo R-squared	0.096	0.081

Notes: Results are from probit regressions, with marginal effects being reported along with robust standard errors in parentheses. *** indicates statistical significance at the 1 percent level, ** at 5 percent, and * at 10 percent.

Table 3: Determinants of weakness

	Probit	Probit	Probit	Probit	Probit	Probit
Dependent Variable	Down-graded from 1/2 to 3/4/5	Down-graded from 1/2 to 3/4/5	Down-graded from 1/2 to 3/4/5	Down-graded at all	Down-graded at all	Down-graded at all
Sample	All	All	Examined	All	All	Examined
Dummy for GSE Holdings	0.0902***	0.0504**	0.0513**	0.120***	0.0802***	0.0764***
	(0.0231)	(0.0215)	(0.0251)	(0.0242)	(0.0255)	(0.0283)
Weak 2008Q3					-0.118***	-0.172***
					(0.0179)	(0.0201)
Loan Delinquency Rate		2.837***	3.618***		3.240***	4.012***
		(0.178)	(0.229)		(0.212)	(0.245)
C&I Loans / All Loans		0.101	0.139*		0.116	0.145*
		(0.0646)	(0.0799)		(0.0743)	(0.0872)
Residential RE Loans / All Loans		-0.0842	-0.0669		-0.0201	0.00897
		(0.0584)	(0.0718)		(0.0613)	(0.0730)
CLD Loans / All Loans		0.282***	0.236***		0.459***	0.448***
		(0.0742)	(0.0914)		(0.0946)	(0.111)
Farm Loans / All Loans		-0.0362	-0.00276		0.0984	0.146
		(0.0786)	(0.0974)		(0.0793)	(0.0943)
Loans / Assets		0.126***	0.160***		0.133***	0.166***
		(0.0428)	(0.0530)		(0.0498)	(0.0581)
Deposits / Assets		0.173***	0.187**		0.0954	0.109
		(0.0659)	(0.0791)		(0.0737)	(0.0836)
CRE/Equity		0.00732	0.0163		0.0127**	0.0190**
		(0.00773)	(0.0103)		(0.00562)	(0.00818)
1(CRE/Equity>3)		0.0937***	0.106***		0.114***	0.127***
		(0.0191)	(0.0237)		(0.0192)	(0.0224)
log(Assets)		-0.00121	-0.00763		0.0198***	0.0173**
		(0.00513)	(0.00617)		(0.00636)	(0.00718)
Tarp recipient dummy		0.0398**	0.0574***		-0.0180	-0.0176
		(0.0176)	(0.0214)		(0.0206)	(0.0238)
Three bank deposit concentration		-0.0507**	-0.0511*		-0.0413	-0.0364
		(0.0245)	(0.0297)		(0.0299)	(0.0345)
Observations	5956	5886	5063	6589	6519	5676
Pseudo R-squared	0.032	0.278	0.295	0.003	0.172	0.185

Notes: The dependent variable uses CAMELS changes between 2008Q3 and 2009Q4. Marginal effects are reported with robust standard errors in parentheses. *** indicates statistical significance at the 1 percent level, ** at 5 percent, and * at 10 percent.

Table 4: Banks with substantial exposure to GSE preferred stock

Institution	Headquarters	Date of event	Exposure to GSE pref. stock	Assets at end of Q2 2008	comments
Failed Banks					
Nine subsidiary banks of FBOP Corporation	Oak Park, IL	10/31/2009	$900 million	$17.3 billion	TARP capital injections were sought but not available because FBOP was privately held. Cross guarantees caused all nine subsidiaries to be seized.
National Bank of Commerce	Berkeley, IL	1/17/2009	$98 million	$445 million	Totally obliterated
Midwest Bank and Trust	Elmwood Park, IL	5/15/2010	$82 million	$3.7 billion	Received an $85 million capital injection through TARP but later failed due to bad real estate loans
Great Basin Bank	Elko, NV	4/18/2009	$2.1 million	$282 million	Contributed to the failure
Venture Bank	Lacey, WA	9/12/2009	$43 million	$1.2 billion	Contributed to the failure
Nevada Security Bank	Reno, NV		$15 million	$632 million	Applied for but did not receive TARP
Banks put up for sale					
Gateway Bank and Trust Co.	Elizabeth City, NC	5/9/2009	$37 million	$2.1 billion	Would have likely failed without merger
State of Franklin Svgs Bank	Johnson City, TN	11/1/2008	$10 million	$354 million	Would have likely failed without merger
Banks that indirectly failed					
PFF Bank and Trust	Pomona, CA	11/22/2008	$0	$4.1 billion	PFF was set to be acquired by FBOP, but FBOP backed out after suffering GSE losses. PFF subsequently failed
Banks that survived					
OneUnited	Boston, MA		$55 million	$724 million	TARP infusion of $12 million
Central Virginia Bank	Powhatan, VA		$18 million	$507 million	TARP infusion of $11 million
First Citizens Bank	Elizabethtown, KY		$6 million	$266 million	TARP infusion of $30 million
Greer State Bank	Greer, SC		$8 million	$429 million	TARP infusion of $10 million
Five Star Bank	Warsaw, NY		$33 million	$1.9 billion	TARP infusion of $37 million
Berkshire Bank	New York, NY		$91 million	$1.0 billion	Owner infused $60 million
Riverbank	North Andover, MA		$10 million	$713 million	

Notes: All of these institutions are commercial banks except State of Franklin Savings Bank, PFF Bank and Trust, and Riverbank, which are savings banks.

Table 5: Balance sheet developments at selected banks with GSE exposure

		Percent of banks with lower loan growth			Percent of banks with lower Tier 1 capital growth		
Institution	Headquarters	08Q2	08Q3	08Q4	08Q2	08Q3	08Q4
Bank USA	Phoenix, AZ	13	48	13	94	3	74
Berkshire Bank	New York, NY	57	65	18	81	0	99
California National Bank	Los Angeles, CA	93	51	42	13	1	2
Central Virginia Bank	Powhatan, VA	65	63	20	13	12	30
Citizens National Bank	Teague, TX	36	33	24	95	4	83
Community Bank of Lemont	Lemont, IL	3	19	16	3	22	9
First Citizens Bank	Elizabethtown, KY	83	76	42	28	5	98
Five Star Bank	Warsaw, NY	61	83	74	19	3	29
Gateway Bank and Trust Co.	Elizabeth City, NC	79	76	26	94	46	10
Great Basin Bank	Elko, NV	41	42	3	68	1	1
Greer State Bank	Greer, SC	76	63	74	19	3	20
Madisonville State Bank	Madisonville, TX	29	59	25	96	1	99
Midwest Bank and Trust	Elmwood Park, IL	37	26	42	36	3	15
National Bank of Commerce	Berkeley, IL	41	9	59	19	0	90
Nevada Security Bank	Reno, NV	30	15	13	57	11	61
North Houston Bank	Houston, TX	64	9	1	68	1	99
OneUnited	Boston, MA	4	11	10	98	0	99
Pacific National Bank	San Francisco, CA	93	86	4	22	1	91
Park National Bank	Chicago, IL	54	57	85	42	5	83
San Diego National Bank	San Diego, CA	91	85	51	17	1	83
Venture Bank	Lacey, WA	54	9	9	51	2	0
	Averages	52.6	46.9	31.0	49.2	6.0	56.0

Notes: Each number represents the banks' position in the distribution of loan growth (or capital changes) across all banks, so that a number of 50 would indicate 50 percent of banks had higher loan growth in that quarter, and a number of 10 would indicate that 90 percent of banks had higher loan growth in that quarter. The capital ratio here is the ratio of Tier 1 capital to risk weighted assets.

Table 6: Loan growth at GSE exposed banks

Dependent variable: Loan Growth	(1)	(2)	(3)
Sample	2008Q4	2008Q4	2007Q1 to 2008Q4
GSE exposure dummy	-1.875***	-4.837***	0.289
	(0.64)	(1.79)	(0.71)
GSE exposure dummy X 2008Q4 dummy			-5.819***
			(1.89)
Capital Ratio 2008Q2		28.18***	
		(4.71)	
Capital Ratio 2008Q2 X GSE		23.52*	
		(13.17)	
Return on Assets	19.06	25.60*	-66.63***
	(15.26)	(14.59)	(11.47)
Weak 2008Q3	-6.017***	-5.508***	-3.597***
	(0.70)	(0.70)	(0.27)
Loan Delinquency Rate	-93.09***	-94.25***	-118.7***
	(6.17)	(6.09)	(3.02)
C&I Loans / All Loans	12.81***	11.34***	13.23***
	(2.69)	(2.72)	(1.02)
Residential RE Loans / All Loans	-1.915	-4.656**	-6.689***
	(2.06)	(2.09)	(0.83)
CLD Loans / All Loans	4.751*	5.931**	14.08***
	(2.57)	(2.54)	(0.93)
Farm Loans / All Loans	-10.46***	-12.15***	-6.787***
	(2.93)	(2.94)	(1.14)
Loans / Assets	12.47***	20.23***	15.60***
	(1.64)	(2.07)	(0.82)
Deposits / Assets	-5.526**	-2.664	-2.284**
	(2.31)	(2.38)	(0.94)
CRE / Equity	0.279	-0.0686	0.0608
	(0.20)	(0.21)	(0.09)
log(Assets)	-0.397*	0.0939	-0.625***
	(0.20)	(0.22)	(0.08)
Tarp recipient dummy	0.619	0.951	1.034
	(1.02)	(1.02)	(1.00)
Three Bank concentration	-1.942**	-1.963**	0.0962
	(0.90)	(0.90)	(0.35)
leverage	-0.0842	0.0949	0.0566
	(0.06)	(0.07)	(0.04)
GSE exposure dummy X 2008Q4 dummy X Capital Ratio			33.41**
			(14.43)
GSE exposure dummy X Capital Ratio			-3.683
			(5.00)
Capital Ratio			15.23***
			(1.85)
Constant	9.431***	-7.893*	5.473***
	(3.31)	(4.25)	(1.60)
Observations	6,291	6,291	51,388
R-squared	0.118	0.128	0.097

Notes: The analysis is via OLS. The top 5% and bottom 2% of the dependent variable have been trimmed. Robust Standard errors are in parentheses. *** indicates statistical significance at the 1 percent level, ** at 5 percent, and * at 10 percent.

Appendix Table A-1: Changes in securities holdings at commercial banks

Call Report Date	Total number of community banks	*(Counter-factual)* number of banks that look like GSE investors	Net realized losses on securities of at least $100k	Large fall in "other equity" close to NRL	Held at least $100k of "other equity"	Large fall in "other debt" close to NRL	Held at least $100k of "other domestic debt"
2007Q1	7151	0	58	0	862	0	1441
2007Q2	7121	8	98	2	852	2	1402
2007Q3	7105	5	54	0	858	0	1445
2007Q4	7077	41	110	16	919	11	1458
2008Q1	7033	9	26	3	971	1	1587
2008Q2	6998	42	78	16	1000	14	1634
2008Q3	6947	**455**	577	221	833	100	1637
2008Q4	6874	216	411	73	763	80	1662
2009Q1	6825	44	130	9	773	23	1713
2009Q2	6785	100	262	5	744	30	1589
2009Q3	6686	55	270	8	702	19	1504
2009Q4	6625	50	269	9	669	17	1417

Notes: Each figure is a number of banks satisfying the condition detailed in the column head. A "large" fall in either securities category is considered to be at least $100 thousand, and it is "close" to the NRL if it is within 20 percent. The counterfactual column represents the number of banks that would satisfy the filter if it were run in those quarters.

Appendix Table A-2: Security holdings at GSE exposed banks

Other equity				
	Flagged banks		Other banks	
Bank assets in 2008Q3	Holdings in 2008Q3	Holdings in 2008Q2	Holdings in 2008Q3	Holdings in 2008Q2
Less than $10m	-	-	15,279	15,814
$10m to $50m	751	11,405	161,426	143,822
$50m to $100m	2,528	24,111	143,423	164,596
$100m to $250m	22,441	139,138	246,920	307,688
$250m to $500m	91,923	494,395	593,750	478,783
$500m to $1b	94,243	441,080	664,319	735,807
$1b to $10b	114,696	876,357	3,753,712	1,984,078
All of the above	326,582	1,986,486	5,578,829	3,830,588

Other domestic debt				
	Flagged banks		Other banks	
Bank assets in 2008Q3	Holdings in 2008Q3	Holdings in 2008Q2	Holdings in 2008Q3	Holdings in 2008Q2
Less than $10m	-	-	8,093	8,310
$10m to $50m	3,540	7,867	185,739	165,306
$50m to $100m	25,390	36,256	392,649	361,533
$100m to $250m	57,015	104,449	1,442,747	1,366,328
$250m to $500m	73,749	143,380	1,486,655	1,583,513
$500m to $1b	104,468	132,339	2,108,046	2,310,447
$1b to $10b	920,578	1,226,175	4,793,361	5,092,916
All of the above	1,184,740	1,650,466	10,417,290	10,888,353

Notes: The top panel includes as GSE exposed banks those that were flagged because of their holdings of "other equity", while the bottom panel includes those that were flagged because of their holdings of "other domestic debt."

Appendix Table A-3: Loan growth results with the "strict" filter

Dependent variable: Loan Growth

Sample	2008Q4	2007Q1 to 2008Q4
GSE exposure dummy	-1.727***	0.344
	(0.669)	(0.786)
GSE dummy X 2008Q4 Dummy		-4.048**
		(1.974)
Return on Assets	20.07	-66.19***
	(15.26)	(11.45)
Weak 2008Q3	-5.914***	-3.572***
	(0.704)	(0.270)
Loan Delinquency Rate	-93.91***	-118.9***
	(6.208)	(3.027)
C&I Loans / All Loans	12.82***	13.16***
	(2.688)	(1.020)
Residential RE Loans / All Loans	-2.045	-6.685***
	(2.065)	(0.830)
CLD Loans / All Loans	5.076*	14.08***
	(2.597)	(0.927)
Farm Loans / All Loans	-10.59***	-6.832***
	(2.938)	(1.143)
Loans / Assets	12.76***	15.57***
	(1.665)	(0.818)
Deposits / Assets	-5.442**	-2.304**
	(2.311)	(0.939)
CRE/Equity	0.370*	0.0716
	(0.216)	(0.0992)
1(CRE/Equity>3)	-0.641	-0.0802
	(0.622)	(0.248)
log(Assets)	-0.398*	-0.610***
	(0.205)	(0.0789)
Tarp recipient dummy	0.639	0.946
	(1.027)	(1.000)
Three bank deposit concentration	-1.937**	0.110
	(0.906)	(0.346)
GSE dummy X Q4 Dummy X Capital Ratio		23.36
		(15.22)
GSE X Lagged Capital Ratio		-7.872
		(5.615)
Lagged Capital Ratio		15.18***
		(1.859)
Constant	9.386***	5.421***
	(3.307)	(1.602)
Observations	6291	51388
R-squared	0.118	0.097

Notes: This table presents results similar to those in Table 4, except that we use a more conservative list of GSE exposed banks, as describe in the appendix