THE VALUE OF REGULATORS AS MONITORS: EVIDENCE FROM BANKING*

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Abstract

While conventional wisdom suggests that regulation is costly for shareholders, agency theory predicts a positive role of regulation in reducing shareholder monitoring costs. I explore this trade-off by studying the value impact of an unexpected decrease in small-bank off-site supervision by the Federal Reserve, and I show that reduced Fed supervision leads to a 7% loss in bank equity market-to-book. These losses come from increased internal monitoring expenditure and managerial rents, and they are larger for banks with high cash flow risk and with non-bank subsidiaries. My results are among the first to quantify the shareholder value of monitoring.

JEL Codes: G21, G28, G32.

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1 Introduction

A common view in the banking industry is that financial regulation has a negative impact on shareholder value: regulatory compliance subtracts resources from lending and deposit-making activities, reduces profits, and ultimately hurts investors. The recent decline of small and medium-sized banks in the United States has often been attributed to regulation, and regulatory burden reduction for small banks has been a priority on the agenda of the US Federal Reserve (the Fed) for the past few years. In a recent testimony to the House Financial Services Committee, the former Chair of the Fed Board of Governors Janet Yellen stated: *"With respect to small and medium-sized banks, we must build on the steps we have already taken to ensure that they do not face undue regulatory burdens."*[1] While the current policy discussion highlights the costs of financial regulation for bank investors, agency theory suggests a positive role for regulation in reducing the costs incurred by bank shareholders to monitor the management.

In this paper, I exploit the regulatory environment of US Bank Holding Companies (BHCs) to study the value impact of regulatory monitoring.[2] The US Federal Reserve (the Fed) is the primary regulator and supervisor of BHCs, and a pervasive component of the Fed's supervisory activity is the collection, verification, and off-site analysis of BHC financial statements (Hirtle, Kovner, and Plosser (2016)). Both the frequency and the volume of BHC reporting to the Fed are based on a fixed asset size threshold, such that smaller BHCs falling below the threshold are exempted from most of the reporting requirements faced by larger BHCs above the threshold. Since the Fed uses these financial statements as the main information source for its off-site supervisory activity, this also implies that banks falling below the asset size threshold face lower supervisory attention than banks above the threshold.

I use a 2006 Fed policy raising this size threshold as a negative shock to the Fed's supervisory attention to smaller banks, and study changes in bank value around the new threshold. My identification strategy comes from the quasi-random assignment of treated banks just below the threshold and control banks just above the threshold *before* the Fed implements its policy, such that systematic

[1] Yellen (2016).

[2] Even if a BHC can include more than one bank, I will use the two terms interchangeably in the rest of the paper unless otherwise specified.

value differences *after* the policy implementation are arguably only due to differences in Fed supervision.

My main finding is that, relative to control banks, banks treated with lower supervision experience a 1% *decrease* in Tobin's q (the market value of bank assets divided by the book value of bank assets) and a 7% *decrease* in Market-to-Book (the market-to-book value of bank equity) after the treatment. This finding is robust across a number of empirical specifications, sample restrictions, placebo tests, and falsification tests. For example, the treatment effect is not driven by changes in bank risk and portfolio composition, financial reporting and disclosure (Hutton, Marcus, and Tehranian (2009)), government bailout guarantees (Gandhi and Lustig (2015)), and one other regulation relaxing small-bank capital requirements around the same period. The effect is stronger around the policy implementation date and threshold, and disappears when I use placebo dates and thresholds to separate treatment and control groups. Moreover, the effect is not driven by pre-existing value differences between treated and control groups, and it is not biased by pre-treatment size manipulation.[3]

How does Fed supervision benefit bank shareholders? In the second part of the paper, I use the lens of a stylized model of costly state verification (Townsend (1979)) to test the hypothesis that supervision reduces shareholder monitoring costs and managerial rent extraction. In the model, bank insiders have an incentive to mis-report bank cash flows to outsiders, and outsiders can pay an audit cost to verify the cash flows reported by insiders. When monitoring is inexpensive, outsiders always audit and extract the entire surplus generated by the bank. As monitoring becomes more expensive (the model counterpart to the new regime of reduced supervision), outsiders' value drops due to increased monitoring expenditure and increased rents to the insiders.

In the data, I document both increased monitoring expenditure and increased managerial rents in banks treated with lower supervision. I show that treated banks experience a 25% increase in their professional expenditures after the treatment, and that this professional expenditure increase is positively correlated with treated banks' shareholder value losses. Using treated banks' 10-K notes, I show that these professional expenditures are mainly related to internal controls consulting, sug-

[3]Reporting exemptions are based on June 2005 BHC assets, but the threshold change is first announced by the Fed in November 2005, thus preventing size manipulation. Additionally, McCrary (2008) tests show no evidence of pre-treatment asset size manipulation.

gesting that outsiders spend more resources in monitoring the management. Using bank ownership data, I show that banks with high ownership by the board chairman (but not by the CEO) experience a larger increase in their professional expenditure than banks with low chairman ownership, suggesting that monitoring incentives are higher in presence of a large shareholder (Shleifer and Vishny (1986)).

Consistent with the prediction of increased rents by bank insiders, I find that less-supervised banks engage in more aggressive earnings management during the financial crisis. I use the increase in interbank lending rates of August 2007 as a shock to the funding costs of banks around $500 million in assets, and I show that banks below the $500 million threshold face higher funding costs than banks above the threshold during the financial crisis.[4] I document that, likely to reduce the negative impact of these increased funding costs on their profits, banks below the threshold manage their earnings by discretionarily *decreasing* their Loan Loss Provisions (LLPs).

To provide additional support for the proposed mechanism, I test one final prediction of the costly state verification model—that value losses should be larger for treated banks with high cash flow risk. Intuitively, cash flow risk increases the likelihood of states where cash flows are low or insiders' rents are high, further decreasing bank value as outsiders' monitoring costs increase. In the data, I measure cash flow risk with the absolute difference between analyst-forecasted and realized bank profitability, and I show that treated banks with high cash flow risk experience larger value losses than treated banks with low cash flow risk. Moreover, I show that treated BHCs with one or more non-bank subsidiaries experience larger value losses and professional expenditure growth than treated BHCs without non-bank subsidiaries, confirming that supervision is particularly valuable when BHC subsidiaries are not monitored by other regulators and when BHC cash flows are more opaque.[5]

Related Literature The recent crisis has stimulated academic interest in the costs and benefits of financial regulation and supervision. This literature typically exploits discontinuities in on-site su-

[4] This finding suggests that Fed monitoring also benefits other categories of bank outsiders (i.e. debtholders).

[5] Unlike BHCs' bank subsidiaries, which are individually supervised by the Fed, the Federal Deposit Insurance Corporation (the FDIC), or the Office of the Comptroller of the Currency (the OCC), BHCs' non-bank subsidiaries are exclusively supervised by the Fed. Recent evidence suggests that these non-bank subsidiaries are often used by BHCs to engage in earnings management (Pogach and Unal (2018)).

pervisory examinations of relatively large banks to show that supervision is positively related to bank efficiency and performance (Barth, Lin, Ma, Seade, and Song (2013), Rezende and Wu (2014)), and negatively related to bank risk-taking and failure (Agarwal, Lucca, Seru, and Trebbi (2014), Hirtle et al. (2016), Kandrac and Schlusche (2017)). My paper adds to this literature by providing a direct estimate of the effect of financial supervision on bank shareholder value, and by showing that off-site supervision (as opposed to on-site supervision) reduces agency conflicts and earnings management in small and medium-sized banks. To the best of my knowledge, my paper is also the first to document a substitution between private monitoring by shareholders and public supervision by regulators.

A long-standing question in financial economics is the extent to which monitoring affects shareholder value. Motivated by theoretical arguments (Shleifer and Vishny (1986), Kahn and Winton (1998), Maug (1998)), the literature has traditionally focused on institutional ownership as a measure of monitoring to estimate the impact of monitoring on firm value (McConnell and Servaes (1990), Ferreira and Matos (2008)). Causal inference is however difficult in these studies, because firm ownership and value are endogenously determined by firms' contracting environment (Himmelberg, Hubbard, and Palia (1999), Coles, Lemmon, and Meschke (2012)). My paper contributes to this literature by using a novel identification strategy to estimate a large and positive impact of monitoring on value. To the best of my knowledge, my paper is the first to test the predictions of a traditional class of monitoring models (Townsend (1979), Gale and Hellwig (1985)), and among the first to show that monitoring is valuable because it reduces managerial rent-seeking.[6]

Theoretical and empirical research shows that agency frictions are particularly severe in banks. The risk profile of bank assets is difficult to observe by outsiders and easy to modify by insiders (Morgan (2002), Dang, Gorton, Holmström, and Ordonez (2017)), and deposit insurance gives bank lenders low incentives to monitor the management (Gorton and Pennacchi (1990)). Moreover, deposit insurance and other bank regulations might distort shareholder incentives to take risk (Merton (1977)), possibly in contrast with managerial preferences (Saunders, Strock, and Travlos (1990)).

[6]My results are close to Bertrand and Mullainathan (2003), Kempf, Manconi, and Spalt (2016), and Schmidt and Fahlenbrach (2017), who focus on different outcome variables to show that monitoring reduces managerial rent-seeking. Falato, Kadyrzhanova, and Lel (2014) show a positive impact of monitoring on firm value, but do not specify the mechanism through which monitoring increases value.

Previous empirical work has argued that agency frictions and managerial rent-seeking can have a negative impact on bank value (Laeven and Levine (2007), Goetz, Laeven, and Levine (2013)). My work provides causal evidence on the impact of agency frictions on bank value, and demonstrates regulatory monitoring as an effective tool to mitigate these frictions.

2 Institutional Background and Empirical Setting

2.1 Institutional Background

The Bank Holding Company Act of 1956 broadly defines a BHC as any company that owns and/or has control over one or more banks. Commercial banks in the United States are not mandated to be part of a BHC structure. However, being part of a BHC offers substantial benefits, such as increased flexibility in raising external financing and acquiring other banks, as well as the ability to acquire non-bank subsidiaries. In practice, these benefits are such that at the end of 2016 around eighty-four percent of commercial banks in the US were part of a BHC.[7]

The benefits of being part of a BHC come at the cost of compliance with the regulatory and supervisory requirements imposed by the Fed. From a regulatory standpoint, Regulation Y from 1980 gives the Fed exclusive jurisdiction in establishing BHC capital requirements, regulating BHC mergers and acquisitions, and defining and regulating non-banking activities performed by BHC subsidiaries. From a supervisory standpoint, Section 5 of the Bank Holding Company Act provides guidance for the off-site and on-site inspections regularly conducted by regional Fed officials under delegated authority from the Board.

For small and medium-sized banks, the vast majority of the Fed's supervisory activity consists of off-site inspections, and the main information source for these inspections is a set of financial statements regularly collected and reviewed by the Fed. In practice, specialized teams of Fed officials focus on the verification, analysis, and comparison of these statements across peer groups of BHCs of similar size. For example, off-site supervisors construct profitability, liquidity, and risk-taking variables using BHC financial data, rank banks according to their performance within a size peer group,

[7] https://www.fedpartnership.gov/bank-life-cycle/grow-shareholder-value/bank-holding-companies.

and flag banks whose financial analysis shows signs of distress.[8] The goal of these off-site inspections and peer-group analyses is to monitor the safety and soundness of individual banks relative to other banks with similar characteristics, and to guide periodic on-site inspections (Eisenbach, Haughwout, Hirtle, Kovner, Lucca, and Plosser (2017)).

The process through which Fed officials collect BHC financial statements and conduct off-site peer group analysis differs across large and small BHCs. Large BHCs need to file every quarter a consolidated financial statement (form FR Y-9C) and a holding parent company statement (form FR Y-9LP) which contain detailed balance sheet, income statement, and off-balance sheet information about the bank's activity. These two sets of financial statements, and in particular form Y-9C, are the main source of information for BHC off-site monitoring and peer group analysis.

To avoid reporting and supervisory burden, the Fed allows smaller BHCs to only file an annual statement for the holding parent company (FR Y-9SP) containings substantially less information about the BHC and the BHC parent than the Y-9C and Y-9LP forms.[9] As a result, small BHCs typically fall out of the Fed's peer group analyses and are subject to less off-site monitoring than large BHCs.

The Fed separates small and large BHCs based on a fixed, bank-independent asset size threshold. From 1986 until the end of 2005, this size threshold was set to $150 million in total assets. In March 2006, the Fed implemented a regulation increasing the threshold to $500 million (71-FR-11194), therefore providing new reporting and supervisory exemptions to all BHCs with assets between $150 and $500 million. Around 1,300 BHCs with assets between $150 million and $500 million stopped filing their Y-9C consolidated financial statements and started filing the Y-9SP statement. In turn, reduced reporting led to almost ten-fold reduction in the number of small BHCs in two supervisory peer groups, from a total of 1,425 BHCs at the end of 2005 to only 172 BHCs at the beginning of 2006.[10]

I exploit the early 2006 change in reporting requirements and reduction in off-site supervision as a shock to shareholder monitoring costs for BHCs between $150 and $500 million in assets.[11] In Section

[8] https://www.ffiec.gov/npw/FinancialReport/BHCPRReports.

[9] For example, the current forms FR Y-9C and FR Y-9LP are sixty-five and ten pages long, respectively, while the form FR Y-9SP is only eight pages long.

[10] The supervisory peer groups affected by the change in reporting requirements are Peer Group 5 and Peer Group 6. See https://www.ffiec.gov/npw/StaticData/bhcpRRPT/REPORTS/BHCPR_PEER/March2006/PeerGroup_5_March2006.pdf.

[11] Rezende and Wu (2014) similarly exploit changes in the threshold that determines the examination frequency of US

2.3, I provide institutional details and empirical evidence supporting the validity of this reporting change as a quasi-natural experiment. In Section 5, I use a sub-sample of voluntary reporters to argue that the negative treatment effect on shareholder value is due to reduced Fed supervision as opposed to reduced financial reporting and disclosure. In Section 5, I also show that my main result is not likely to be driven by the (almost) contemporaneous regulation 71-FR-9897 on small-bank capital requirements. To the best of my knowledge, this is the only other regulation affecting the same set of banks that were affected by reduced reporting requirements in the first quarter of 2006.

2.2 Data

The data on BHC total consolidated assets comes from the Federal Reserve Regulatory Dataset. This dataset is publicly available on the Federal Reserve of Chicago's website, and it contains information directly coming from the FR Y-9C, FR Y-9LP, and FR Y-9SP reports. I use the dataset to categorize BHCs into treated and control groups based on their 2005 average consolidated assets, and to keep track of which BHCs file which forms in each quarter.[12] Since the Fed policy allows treated banks to stop reporting their FR Y-9C consolidated statements, I use Compustat Bank as my main source of BHC consolidated financial data. I combine this dataset with CRSP to obtain end-of-quarter BHC market-to-book values, and in turn merge the Compustat-CRSP combined dataset with the Federal Reserve Regulatory Dataset using the link table available on the Federal Reserve of New York's website.

The observation frequency is quarterly, starting with the first quarter of 2004 and ending with the last quarter of 2007. Within this time period, I construct my main sample as follows. I focus on top-tier BHCs (defined as in Goetz, Laeven, and Levine (2016) as BHCs that are not owned by any other BHC but possibly own other BHCs) with average 2005 total assets between \$150 and \$850 million, and with stock price data available on CRSP. I assign individual BHCs to the treated group if

commercial banks to analyze the impact of financial supervision on bank performance. The policies used in their study are however different both in terms of their target (commercial banks versus BHCs) and in terms of their timing (early versus late 2006) from the policy I use in this paper.

[12] This is important because some BHCs voluntarily keep filing forms FR Y-9C and FR Y-9LP even if their total assets are below \$500 million after the treatment. As I show in Section 5, voluntary filers experience value losses similar to those of the other treated banks, confirming that these losses come from an implicit reduction in Fed monitoring as opposed to a reduction in bank reporting.

their average total assets in 2005 are between $150 million and $500 million, and to the control group if their average total assets in 2005 are between $500 million and $850 million.[13] The final sample consists of 2,780 observations on 208 distinct BHCs, out of which 108 belong to the treated group and 100 belong to the control group. These BHCs represent around ten percent of the total number of BHCs in the US at the end of 2005, and around forty-six percent of the BHCs listed on the stock market at the end of 2005. In terms of size, these banks represent around one percent of the total assets in the banking sector at the end of 2005, and around five percent of the assets in the bottom ninety-nine percent of the asset distribution. The average pre-treatment BHC asset size in the main sample is $519 million, right above the policy implementation threshold.

Table 1 reports summary statistics for my main measures of bank value and internal monitoring expenditure, both in the full sample and in the treated and control sub-samples.[14] The first two rows of Panel A show summary statistics for my measures of bank shareholder value, Tobin's q and the Market-to-Book ratio of bank equity. The data shows little dispersion in these valuation ratios, both within the main sample and across the treated and control sub-samples. The average and median Tobin's q in the main sample are 1.07 and 1.06, respectively, and the average and median Market-to-Book are 1.75 and 1.65.

The third row of Panel A shows summary statistics for bank professional expenditures, in millions of US dollars. These expenditures are recorded as separate items on the income statements that banks file with the Security Exchange Commission (SEC), and include fees paid to consulting, auditing, and investment banking firms. In Section 4.2, I show that in my sample professional expenditures are a good proxy for shareholder monitoring, because they are mostly related to the implementation of internal controls. Banks in the treated group pay slightly lower professional fees than banks in the control group. On average, treated banks spend 0.13 million of dollars per quarter in professional services, with a standard deviation of 0.14 million. Control banks spend on average 0.16 million of dollars per quarter, with a standard deviation of 0.18 million.

[13] I choose the upper bound of $850 million in total assets in such a way that the final treated and control samples contain approximately the same number of banks. In Section 3.2, I use $1 billion and $1.5 billion as alternative upper bounds, and show that the main results of the paper are robust to these upper bound choices.

[14] Since I only observe evidence of managerial rents during the financial crisis, I leave a description of how I measure these rents to Section 4.3.

Panel B of Table 1 reports summary statistics for the other main variables of the paper, which I borrow from the literature as potential determinants of cross-sectional heterogeneity in bank value (Laeven and Levine (2007), Minton, Stulz, and Taboada (2017)). These variables include leverage (total liabilities minus noncontrolling interest divided by total assets), the Tier 1 Regulatory Capital Ratio (henceforth Tier 1 Ratio, the bank self-reported ratio of Tier 1 Capital divided by Risk-Weighted Assets), total assets, profitability (net income divided by net interest income), Return on Equity (ROE, net income divided by book value of equity), diversification (non-interest income divided by net interest income), and quarterly asset growth. To control for potential differences in the portfolios of treated and control BHCs at the onset of the financial crisis, I also include Non-Performing Assets (percentage non-performing assets to total assets) as an additional control variable. As in Panel A, the data reveals little differences in these variables across treated and control groups, confirming the comparability of these two sets of banks.

2.3 Estimation Strategy and Identification

In this section, I describe how I exploit the change in regulatory reporting requirements to the Fed as a quasi-natural source of variation in shareholder monitoring costs. My empirical strategy compares the value of treated banks with pre-treatment total assets just below \$500 million with the value of control banks with pre-treatment total assets just above \$500 million, before and after the treatment. Specifically, I estimate the model

$$Y_{it} = \beta_0 + \beta_1 \left(\text{Post}_t \times \text{Treated}_i\right) + \beta_2 X_{it} + \gamma_i + \delta_t + \varepsilon_{it}, \quad (1)$$

where Y_{it} is an outcome variable (e.g. Tobin's q) for BHC i in quarter t, Post_t is an indicator equal to one if quarter t follows the last quarter of 2005 and zero otherwise, Treated_i is an indicator equal to one if the average assets of BHC i during 2005 are just below \$500 million, X_{it} is a matrix of time-varying control variables (such as assets and profitability), γ_i is a time-invariant and BHC-specific fixed effect, δ_t is a BHC-invariant and time-specific fixed effect, and ε_{it} is a normally-distributed error term. The coefficient of interest is β_1, my estimate of the value difference between treated and control banks before and after the treatment.[15]

My empirical strategy relies on the identification assumption of quasi-random assignment of treated and control banks around the threshold *before* the Fed changes the reporting requirements of treated banks, such that any systematic value difference *after* the policy implementation is arguably only due to differences in Fed supervision. This assumption can be violated for two reasons. First, the assumption is violated if the threshold change results from lobbying, making the treatment an endogenous outcome. Second, the assumption is violated if, even in absence of lobbying, banks engage in size manipulation around the new threshold before its implementation.

Although the institutional details of the policy suggest that lobbying was unlikely, whether the policy was unanticipated by bank shareholders is ultimately an empirical question.[16] In Figure 1 I report a diagnostic test aimed at detecting pre-existing differences in the average valuation of treated and control banks before the treatment. Panels A and B report these diagnostics for Tobin's q and Market-to-Book, respectively, and are constructed as follows. I first divide the sample into two sub-samples, the pre-treatment sample before the first quarter of 2006 and the post-treatment sample starting with the first quarter of 2006. In each of these sub-samples, I run a kernel-weighted local polynomial regression to obtain a smoothed estimate of the trend component of treated and control banks' valuation. In Figure 1 I then plot these estimated trend components and their associated confidence intervals as functions of the observation quarter, both in the pre- and in the post-treatment periods.[17] Figure 1 shows that the trend components of treated and control banks' valuation are statistically indistinguishable from each other in the pre-treatment period, supporting the claim that the threshold change was unanticipated. Moreover, the figure shows an increase in the difference between treated and control banks' average valuation after the treatment, providing a visual preview of the results in the next section.

In Figure 2, I report the results of a McCrary (2008) discontinuity test aimed at reducing concerns

[15] In the appendix, I run alternative specifications in which I also control for the distance between bank assets and the $500 million threshold.

[16] The first proposal for public comment on the policy dates to November 2005, and the policy was quickly implemented at the beginning of March 2006 without modifications to the initial proposal.

[17] I divide the sample to prevent post-treatment observations from entering the estimation of the pre-treatment trend, and vice-versa. All panels of Figure 1 are constructed using an Epanechnikov kernel and the rule-of-thumb bandwidth size suggested in Fan and Gijbels (1996). Different kernel and bandwidth choices generate similar results.

of bank size manipulation around the $500 million threshold. Specifically, I construct a finely-gridded histogram of bank total assets, which I then smooth on each size of the threshold using local linear regression. In Figure 2, I then report point estimates and 95% confidence intervals of these smoothed asset densities during the 2005-2007 period (Panel A) and during the four quarters immediately before the treatment (Panel B). Both before and after the treatment, the estimated asset density below the threshold is not statistically different from the estimated asset density above the threshold.[18] Importantly, an institutional feature of the policy reduces residual concerns of asset manipulation before the treatment. The policy states that individual BHCs qualify for reporting exemptions only if their June 2005 consolidated assets are below $500 million. At the same time, the Fed first publicly announces the threshold change in November 2005, preventing pre-treatment size manipulation.

3 The Shareholder Value of Supervision

This section presents my main results on the impact of supervision on bank shareholder value, as well as robustness tests on these results.

3.1 Main Results

Table 2 shows my main findings on the value impact of supervision. The table reports point estimates for the coefficients in Equation (1), along with their standard errors (clustered at the BHC-level). The main coefficient of interest is the coefficient associated with the "Post $\times$ Treated" term, which represents an estimate of the percentage change in Tobin's q and Market-to-Book due to the change in BHC reporting requirements.

When I estimate Equation (1) only including quarter- and BHC-level fixed effects, the treatment leads to a one percent decline in the Tobin's q of treated banks, relative to the Tobin's q of control banks. The economic magnitude and statistical significance of the treatment effect are not affected by the inclusion of leverage and the Tier 1 Ratio to the specification, reducing concerns that the effect might be due to contemporaneous changes in small-bank capital requirements (see Section 5).

[18] All the results are calculated using the histogram bin size and the local linear regression bandwidth suggested in McCrary (2008).

Everything else equal, a ten percent increase in leverage and Tier 1 Ratio are respectively associated with a 3.4 and a 3.8 percent increase in Tobin's q, but the treatment still induces a 1.1 percent decrease in Tobin's q after the inclusion of these variables. Specification (3) shows that the results are also robust to the inclusion of size, profitability, diversification, asset growth, and non-performing assets as additional controls.

In the last three specifications of Table 2, I repeat the same exercise of the first three specifications using Market-to-Book as dependent variable. The treatment induces a 7.4 percent loss in Market-to-Book for treated banks, and this value loss is as high as 8.3 percent when I add time-varying controls to the specification. To put these numbers in perspective, a seven percent relative decrease in Market-to-Book corresponds to a \$4 million relative decrease in market capitalization for the average treated bank, implying an aggregate market capitalization loss of approximately \$430 million. Finally, a comparison of the first three and the last three columns of Table 2 shows that the treatment effect on Tobin's q is almost one order of magnitude smaller than the treatment effect on Market-to-Book. This is due to leverage, which reduces the impact of equity fluctuations on the market value of bank assets.[19]

3.2 Robustness, Placebo, and Falsification Tests

Table 3 reports two sets of tests aimed at reducing sample selection concerns. In the interest of space, I only present results for Market-to-Book, leaving the results for Tobin's q to the appendix. In Panel A, I test the impact of different sample bandwidth restrictions on my main result. In the first four specifications of the table, I use two small samples of BHCs with average 2005 total assets between

[19] A simple example can illustrate this point. Respectively define by E_t, D_t and M_t the book value of equity, the book value of debt and the market value of equity in quarter t. Suppose that E_t and D_t do not change between quarter t and quarter $t+1$ (i.e. $E_t = E_{t+1} \equiv E$ and $D_t = D_{t+1} \equiv D$), but M_t changes to M_{t+1}. Let $\Delta M_{t+1} \equiv M_{t+1} - M_t$. Finally, let mb_t and q_t respectively define the Market-to-Book ratio and Tobin's q at time t. The change in Market-to-Book between time t and $t+1$ is given by

$$\Delta mb_{t+1} = \frac{M_{t+1}}{E_{t+1}} - \frac{M_t}{E_t} = \frac{\Delta M_{t+1}}{E}. \tag{2}$$

Then, changes in Tobin's q can be expressed as a function of changes in Market-to-Book and bank leverage:

$$\Delta q_{t+1} = \frac{M_{t+1} + D_{t+1}}{E_{t+1} + D_{t+1}} - \frac{M_t + D_t}{E_t + D_t} = \frac{\Delta M_{t+1}}{E + D} = \left(1 - \frac{D}{E+D}\right) \Delta mb_{t+1}, \tag{3}$$

where the term in parentheses in (3) is on average equal to 9% in my sample.

$400 and $600 million, and between $300 and $700 million. In the last four specifications, I use two large samples of BHCs with total assets between $150 million and $1 billion, and between $150 million and $1.5 billion. To mitigate the impact of confounding factors at the onset of the financial crisis as the sample size changes, the results of Table 3 only include data for 2005 and 2006. The table shows that the main results of the paper are not sensitive to different sample bandwidth choices. Moreover, the first four specifications show that the treatment leads to a larger value drop for BHCs that are closer to the threshold before the treatment.

In Panel B, I show that the statistical significance and the economic magnitude of my results disappear when I separate treated and control banks using arbitrary treatment thresholds and quarters. The first six specifications show that the results disappear when I use placebo asset thresholds of $300 million, $750 million, and $1 billion to separate treated and control banks. Similarly, the last four specifications show that the results disappear when I use the last quarter of 2004 and the last quarter of 2006 as placebo treatment quarters.[20]

In the appendix, I provide additional robustness tests. First, I run an event study to show that the observed drop in Tobin's q and Market-to-Book are driven by a drop in the market value of treated banks as opposed to an increase in their book value or an increase in the market value of control banks. Second, I apply additional restrictions on the main sample to include the financial crisis, to exclude banks that drop out of the sample, and to exclude banks that are not listed on the stock market before 2006. Third, I augment the main specification of Table 2 with distance polynomials to control for possible non-linearities in the value-size relationship above and below $500 million, and with both State and State $\times$ Time Fixed Effects to control for potential clustering of treated and control BHCs in different areas of the US. My results are robust to these additional restrictions and specifications.

Fourth, I show that the treatment effect is roughly uniform at the peak of the business cycle in 2006 and at the beginning of the financial crisis in 2007, suggesting that the findings of Table 2 are not specific to the economic environment of early 2006. Fifth, using Compustat data I construct two

[20] The last column of Panel B shows a marginally significant treatment effect on Market-to-Book, possibly reflecting updated investor expectations about managerial rents during the crisis (see Section 4.3). The results on Tobin's q in the appendix show that this effect is however statistically weak.

falsification samples of non-financial firms and non-BHC financial firms (e.g. insurance companies and banks that are not BHCs), and study whether the valuation of firms with 2005 average total assets just below $500 million changes after the treatment date, relative to the valuation of firms with total assets just above $500 million. The data provides no evidence of value changes in these falsification samples, confirming that the Fed threshold change, as opposed to other size-based regulations also affecting firms not regulated by the Fed, is the main driver of the observed value losses.

4 How does Supervision Benefit Shareholders?

In this section, I propose and test the hypothesis that the value losses documented in the previous sections are due to increased shareholder monitoring costs. In Section 4.1, I present a stylized model of costly state verification to provide a theoretical framework for my empirical tests. The model predicts that, following an increase in shareholder monitoring costs, shareholder value should drop due to increased monitoring expenditure and increased managerial rents, and that shareholder value should drop more when firms have high cash flow risk. In Sections 4.2-4.5, I provide empirical evidence supporting these predictions. In Section 4.2, I document a large increase in post-treatment monitoring expenditures by treated banks, and I show that this increase is positively correlated with post-treatment shareholder value losses. In Section 4.3, I measure managerial rents with earnings management and I provide evidence of increased earnings management by treated banks during the financial crisis. In Sections 4.4 and 4.5, I respectively show that shareholder value losses are larger for treated BHCs with high cash flow risk, and for treated BHCs with one or more non-bank subsidiaries.

4.1 A Stylized Model of Costly State Verification

In this section, I derive three testable predictions from a classic model of monitoring (Townsend (1979), Gale and Hellwig (1985)). Testing these predictions allows me to attribute the observed value losses to their main economic drivers, and to argue that (in the context of my experiment) Fed monitoring is valuable because it reduces shareholders' verification costs and managerial rent extraction.

There are two agents in the model, a penniless insider (an agent) and an outsider with deep pockets (a principal). The agent and the principal are both risk-neutral, and the risk-free rate is zero. The agent has monopoly access to a project with cost I, which generates a random cash flow $y \in \left[\underline{y}, \bar{y}\right] \subseteq \mathbb{R}_+$ with cdf F and pdf f at the end of the period. The project has positive NPV, which I denote by V_f:

$$V_f = \int_{\underline{y}}^{\bar{y}} y dF(y) - I > 0. \tag{4}$$

The agent costlessly observes the realized project cash flow, and must report the cash flow to the principal. The agent can consume the difference between the realized cash flow and the cash flow that she reports to the principal, and therefore has an incentive to under-report. On the other hand, the principal can pay an audit cost k to perfectly observe the realized cash flow.

The principal has full bargaining power, and her problem is to maximize her expected profits while eliciting truthful cash flow revelation by the agent. Resorting to the revelation principle, I characterize contracts in which the agent always reveals the true cash flow. A contract is then a couple $\{\pi(y), m(y)\}$ that specifies payments from the agent to the principal $\pi(y) : \left[\underline{y}, \bar{y}\right] \to \mathbb{R}$ and monitoring decisions $m(y) : \left[\underline{y}, \bar{y}\right] \to \{0, 1\}$ as functions of the cash flow reported by the agent. I assume that audits are deterministic, in the sense that for all y, $m(y)$ is either 0 or 1. This partitions the set $\left[\underline{y}, \bar{y}\right]$ in a region where the principal always audits the agent and a region where the principal never audits the agent.

The principal maximizes her expected profits

$$\int_{\underline{y}}^{\bar{y}} \left[\pi(y) - m(y) k\right] dF(y) - I, \tag{5}$$

subject to the agent's participation constraint

$$\int_{\underline{y}}^{\bar{y}} \left[y - \pi(y)\right] dF(y) \geq 0, \tag{6}$$

the agent's limited liability constraint that, for all y,

$$y \geq \pi(y), \tag{7}$$

and the incentive-compatibility constraints ensuring that the agent always reveals the true cash flow. For the contract to be incentive-compatible, the following conditions must be verified. First, in the non-monitoring region the principal must always receive a constant payment P.[21] This allows to write the payment $\pi(y)$ as

$$\pi(y) \quad = \quad (1 - m(y)) P + m(y) \pi_1(y), \tag{8}$$

where $\pi_1(y)$ is the payment in the monitoring region. Second, to prevent the agent from reporting cash flows in the non-monitoring region when the observed cash flow is in the monitoring region, it must be that

$$m(y) \pi_1(y) \quad \leq \quad P. \tag{9}$$

Constraints (8) and (9) characterize incentive-compatibility by the agent. The principal's problem then becomes finding $m(y)$ and $\pi_1(y)$ to maximize her expected profits, subject to constraints (6)-(9).

In the appendix, I solve for the optimal contract. As in Gale and Hellwig (1985), the optimal contract is such that the monitoring region is the low cash flow region for which $\pi(y) = y < P$, and the non-monitoring region is the high cash flow region for which $y \geq \pi(y) = P$. In the monitoring region, the principal pays the monitoring cost k and the agent gives all the cash flow to the principal. In the non-monitoring region, the principal receives the fixed payment P and the agent keeps $y - P$.

Conditional on the optimal contract, the optimal fixed payment P^* is chosen by the principal to solve the unconstrained problem

$$\max_P \int_{\underline{y}}^{P} (y - k) \, dF(y) + P(1 - F(P)) - I. \tag{10}$$

[21] If for some cash flow realization in the monitoring region the contract specifies a lower payment than for other realizations in the monitoring region, there is an incentive for the agent to report the cash flow associated with the lower payment.

Taking the first-order conditions of this problem and re-arranging, I get

$$1 - F\left(P^*\right) \quad = \quad kf\left(P^*\right), \tag{11}$$

which shows that at the optimum, the principal balances the benefits of increasing P coming from reduced rents with the costs coming from increased monitoring.

The first testable prediction of the model comes from inspection of Equation (11), by noting that as the monitoring cost k becomes small, the probability $F\left(P^*\right)$ that the principal monitors the agent approaches one. In other words, when monitoring is inexpensive the principal always monitors and extracts the entire NPV from the project.[22]

Prediction 1 *An increase in outsiders' monitoring costs leads to value losses by outsiders.*

Next, let V_c denote the principal's value when monitoring is costly (i.e. $k > 0$):

$$V_c \quad = \quad \int_{\underline{y}}^{P^*} (y - k)\, dF(y) + P^*\left(1 - F\left(P^*\right)\right) - I. \tag{12}$$

The value loss from a world where monitoring is costless and the principal extracts the entire project NPV is then

$$V_f - V_c \quad = \quad kF\left(P^*\right) + \int_{P^*}^{\bar{y}} \left(y - P^*\right) dF(y), \tag{13}$$

which consists of monitoring expenditures and rents by the insider.

Prediction 2 *When outsiders' monitoring costs increase, losses in value are due to increased monitoring expenditure and rents by insiders.*

The last model prediction requires assumptions on the distribution of bank cash flows. To provide intuition, I assume that cash flows are uniformly distributed over the interval $\left[\underline{y}, \bar{y}\right]$. The model

[22] Note that the value of the aggregate claim of all firm's outsiders (both shareholders and debtholders) should decrease and look more "debt-like" (Townsend (1979), Gale and Hellwig (1985)) when outsiders' monitoring costs increase. In the data, I observe a change in the value of debtholders' claims only during the financial crisis, when the funding costs of treated banks increase (see Section 4.3).

generates similar predictions for other types of distributions (e.g. lognormal). Using a uniform distribution, some algebra shows that the principal's value loss (13) becomes

$$V_f - V_c = k\left(1 - \frac{1}{2}\frac{k}{\bar{y} - \underline{y}}\right), \tag{14}$$

which is increasing in $\bar{y} - \underline{y}$. Noting that $\bar{y} - \underline{y}$ is proportional to cash flow risk, the last prediction directly follows.[23]

Prediction 3 *When outsiders' monitoring costs increase, value losses are increasing in cash flow risk.*

Intuitively, when cash flow risk increases the likelihood of states where cash flows are low or rents are high increases, thus reducing outsiders' value relative to a world where monitoring is costless and the insider cannot extract any rents.

The first prediction of the model is that increased monitoring costs should lead to value losses by outsiders, and it is therefore consistent with the shareholder value losses documented in the previous sections. In the following sections, I test the second and third predictions of the model. Testing the second prediction allows me to attribute shareholder value losses to monitoring expenditure and managerial rents. Testing the third prediction provides additional support for the proposed mechanism—that reduced supervision by the Fed increases shareholder monitoring costs.

4.2 Monitoring Expenditure

The costly state verification model presented in the previous section predicts that treated banks' value losses should be due to increased shareholder monitoring expenditure and managerial rents. In Table 4, I provide a first test of this prediction by showing that, relative to control banks, treated banks experience a twenty-five percent increase in their professional expenditure after the treatment. This increase in professional expenditure is economically large for treated banks, amounting to approximately twenty-seven thousand dollars per quarter or 3.8 percent of the average treated bank's pre-treatment quarterly net income. When I discount these increased professional expenditures (after-taxes) at an average quarterly ROE of two percent, their discounted present value amounts to slightly

[23] The standard deviation of a uniform distribution with support $[a, b]$ is given by $(b - a)/\sqrt{12}$.

less than a million dollars, around twenty-five percent of the four million relative drop in market value experienced by the average treated bank. In other words, increased monitoring expenditures only account for a fraction of the loss in treated bank value.

In Table 5, I document a positive correlation between shareholder value losses and professional expenditure in the treated sample. Specifically, I show that only in the sub-sample of treated banks (Panel A) the post-treatment professional expenditures are negatively correlated with shareholder value, while such correlation disappears in the control sample (Panel B). These results support the model's intuition that the value losses experienced by treated banks are at least partially due to increased professional expenditure.[24]

In the appendix, I confirm that the post-treatment professional expenditure growth of treated banks is mainly related to increased management monitoring by shareholders. First, I show that fees paid to consultants experience a much larger increase after the treatment than fees paid to auditors (from annual AuditAnalytics). Second, I show that BHCs with high pre-treatment levels of ownership by the board chairman (but not by the CEO) experience a larger increase in their post-treatment professional expenditure than BHCs with low pre-treatment chairman ownership, suggesting that management-monitoring incentives are more aligned in banks with high chairman ownership (Shleifer and Vishny (1986)). Third, I divide treated banks into two sub-groups based on whether, after the treatment, the notes to their 10-Ks mention or do not mention consulting for internal controls as a component of their professional expenditure. I show that the increase in professional expenditure is larger for treated banks that cite internal controls as a significant source of professional expenditure.

4.3 Managerial Rents

In this section, I measure managerial rents with earnings management, and provide empirical support for the hypothesis that treated BHCs' increased monitoring costs lead to increased managerial rents. I use the August 2007 increase in money market rates as a shock to the funding costs of BHCs

[24] An unreported triple-differences specification including a "Post × Treated × Professional Expenditure" interaction term provides similar insights—a negative correlation between shareholder value losses and post-treatment professional expenditures of treated banks. These results are not statistically significant, however, likely due to lack of power.

with total assets around the $500 million threshold, and analyze the impact of this negative shock on the funding costs and earnings management of banks right above and right below the threshold. Since money market rates are determined in the interbank lending market of large banks, banks with assets around $500 million arguably play a negligible role in determining this funding shock. Any observed difference in funding costs and earnings management of banks right around the threshold should only arise from the different exposure of these banks to Fed supervision.

To test whether the 2007 shock has a different impact on banks with assets right around the threshold, I construct two new groups of treated and control banks. The new group of treated, "unmonitored" BHCs consists of less-supervised BHCs with less than $500 million in assets during the 2006-2008 period. The new group of control, "monitored" BHCs consists of more-supervised BHCs with more than $500 million in assets during the same period. To avoid potential bias due to the change in the definition of small BHCs (that is, my main experiment), I drop observations before the first quarter of 2006. Moreover, I drop BHCs with total assets above $700 million such that systemic banks are excluded from the sample and such that the unmonitored and monitored groups have roughly the same number of banks (sixty-seven and fifty-seven, respectively). My results are not sensitive to this sample bandwidth choice.

In Table 6 I report results on the impact of Fed supervision on funding costs and earnings management during the crisis.[25] Panel A shows the relative impact of Fed supervision on the funding costs and Loan Loss Provisions (LLPs) of less-supervised banks. In the first three specifications of Panel A, I use total interest expense divided by total loans as a measure of BHC funding costs. The table shows that during the crisis the difference between the funding costs of unmonitored and monitored banks increases by as much as 5.4 percent relative to the pre-crisis period, and that this effect is robust to the inclusion of lagged Tobin's q, leverage, the Tier 1 Ratio, total assets, diversification, asset growth, and non-performing loans as regression covariates. This result suggests that also the value of debtholders' claims can be negatively affected by reduced supervision (see Section 4.1). The next three specifications suggest that—possibly to mitigate the negative impact of increased funding costs on their profitability—less-supervised banks *decrease* their LLPs. While the results of these specifica-

[25]Summary statistics for the dependent variables used in this section are reported in the appendix.

tions are not statistically significant, the point estimates indicate a twenty percent relative decrease in monitored bank LLPs during the crisis. I interpret these changes in bank loan loss provisions as evidence of earnings management and managerial rents (Fudenberg and Tirole (1995)).

In Panel B, I confirm this hypothesis by showing a large increase in unmonitored banks' Discretionary Negative Loan Loss Provisions (DNLLPs) during the crisis. These discretionary provisions are the absolute negative residuals from a first-stage regression of LLP on observable performance variables, and measure the negative change in LLP that is not due to bank performance (Kanagaretnam, Lim, and Lobo (2014)). Panel B shows a relative DNLLP increase as large as seventy percent for unmonitored banks, confirming that the decline in LLP documented in Panel A is due to managerial discretion as opposed to performance.

In the appendix, I run additional tests to reduce concerns that the results of Table 6 might be driven by a subset of small, distressed banks during the crisis rather than by supervision. I show that the results of Table 6 are robust within the sample of banks surviving for the entire 2006-2008 period, and lose economic and statistical significance when I choose an alternative threshold of $400 million to define the two groups of unmonitored and monitored banks.[26]

4.4 Cash Flow Risk

In Table 7, I test the prediction that banks with high cash flow risk should experience larger value losses after the treatment than banks with low cash flow risk. To do so, I first use monthly data from I/B/E/S to compute the absolute difference between analyst consensus forecasts of one-year-forward bank EPS and the realized EPS values corresponding to these consensus forecasts. I then construct my main cash flow risk measure as the quarterly average of this monthly absolute difference, and assign banks to two groups based on whether their average 2004-2007 cash flow risk is above or below the median cash flow risk in my sample.

In Table 7, I study the treatment effect on treated banks with different levels of cash flow risk. The coefficients of interest are the "Post $\times$ Treated" coefficient, capturing the treatment effect on treated

[26]The appendix also shows a statistically significant effect on LLPs in the group of banks that survive for the entire 2006-2008 period. This suggests that the low statistical significance of the LLP coefficients of Table 6-Panel A are due to banks that disappear from the sample during the crisis.

banks with low cash flow risk, and the "Post × Treated × High CF Risk" coefficient, capturing the incremental treatment effect on treated banks with high cash flow risk.[27] The first two specifications of the table show that treated banks with high cash flow risk experience around ten percent larger value losses than treated banks with low cash flow risk. This result also holds when I use alternative measures of risk to categorize high- and low-risk banks. In particular, the result holds when I use quarterly equity volatility in Specifications (3) and (4), and when I use the quarterly tail risk measure of Ellul and Yerramilli (2013) in Specifications (5) and (6). Overall, the results of the table are consistent with the theoretical prediction that banks with more volatile cash flows are also those that should experience larger value losses as a result of reduced supervision.

4.5 Non-Bank Subsidiaries

In Table 8, I show that treated BHCs with one or more non-bank subsidiaries experience larger post-treatment value losses than BHCs without non-bank subsidiaries. Non-bank subsidiaries are used by BHCs to engage in earnings management (Pogach and Unal (2018)), and unlike bank subsidiaries (which are individually monitored either by the Fed, the FDIC, or the OCC) they are exclusively monitored by the Fed. Hence, one should expect larger value losses for treated BHCs with non-bank subsidiaries, where Fed monitoring is relatively more important and where cash flows are more difficult to verify by outsiders.

Table 8 shows the results of a triple-differences exercise similar to the one in Table 7, where I first divide BHCs into two groups based on whether they have zero or one or more non-bank subsidiaries before the treatment, and then analyze the treatment effect on shareholder value and professional expenditures in these two groups of treated BHCs. The first three specifications of the table show that treated BHCs with at least one non-bank subsidiary experience value losses that are as much as nine percentage points larger than the value losses of treated BHCs without non-bank subsidiaries, confirming that Fed monitoring is particularly valuable when BHCs have non-bank subsidiaries. On the other hand, the last three specifications show that professional expenditure growth is as much as

[27]Note that the terms "Treated," "Post," "High CF Risk," and "Treated × High CF Risk" are captured by BHC and time fixed effects. When I run alternative specifications using these lower-order terms instead of fixed effects, the point estimates of the coefficients of Table 7 are unchanged, but the standard errors of the estimates considerably increase. This suggests large variability in market-to-book both at the bank level and at the quarter level.

thirty percent larger for treated BHCs with non-bank subsidiaries, confirming an increased internal monitoring effort in these banks.

5 Discussion and Tests of Alternative Hypotheses

The results of the previous sections suggest that the large value losses of treated banks are due to increased shareholder monitoring costs following a reduction in Fed supervision. Quantitatively, the discounted present value of increased monitoring expenditures accounts for around twenty-five percent of treated banks' value losses, and the model allows me to attribute the residual losses to increased managerial rents. Despite empirical evidence supporting the model's predictions, it is however hard to finally conclude that these residual losses are due to managerial rents. My strategy is to rule out competing hypotheses.[28]

Financial Statement Disclosure A first possible channel for the losses in treated bank value is reduced financial disclosure (Hutton et al. (2009), Granja (2018)), since much of the information that BHCs report to the Fed is made publicly available. To rule out this hypothesis, I use a provision of the Fed's policy allowing treated BHCs to keep filing form FR Y-9C, while also preventing them to revert to form FR Y-9SP if they choose to do so. Following this provision, I define treated banks as voluntary filers if they file form FR Y-9C in March 2006 (the first quarter in which the policy becomes effective).[29] In the appendix, I analyze the treatment effect on twenty-nine voluntary filers (the voluntary-reporting group), and compare it to the effect on the remaining treated banks (the not-reporting group). The treatment effect on each sub-group is roughly a one percent decrease in Tobin's q, both in baseline specifications and when I add time-varying controls. Similarly, the treatment induces a nine percent drop in voluntary-reporting BHCs' Market-to-Book, even larger than the eight percent drop for not-reporting BHCs. The results are similar when I add time-varying controls,

[28]For expositional convenience, the tables relative to this section are confined to the appendix. Unreported tests show no changes in bank lending behavior, net interest margins, and profit volatility, providing additional support for the proposed channel.

[29]The policy gives the Fed the option to determine if a small bank should file form FR Y-9C based on additional individual criteria such as diversification. However, this provision is only effective from the second half of 2006 and virtually never used by the Fed in subsequent periods (see, for example, Killian (2015)).

confirming that the treatment affects treated banks irrespective of their financial disclosure. Moreover, these results confirm that Fed supervision (as opposed to BHC reporting to the Fed) is the main driver of the value losses experienced by treated banks.

Liquidity, Risk, and Market Frictions Another possible concern is that the stocks of treated BHCs might become riskier or less liquid following the treatment. Lower information availability might decrease the liquidity of treated banks' stocks—therefore justifying an illiquidity premium. Reduced supervision might lead to changes in bank risk-taking (Hirtle et al. (2016)), in turn affecting the risk-return profile of bank equity. Alternatively, institutional investors might treat the stocks of small and large banks differently, possibly using Fed thresholds to define their investment strategy. For example, if many institutional investors can only hold the stocks of large banks, one would expect a decrease in turnover, an increase in idiosyncratic risk, and a decrease in market information responsiveness for treated banks' stocks.

My results show no significant changes in the liquidity, volatility, and market information responsiveness of treated banks' stocks after the treatment. More specifically, the data shows no significant changes in five stock liquidity measures commonly used in the market microstructure literature, namely Effective Tick Size (Holden (2009), Goyenko, Holden, and Trzcinka (2009)), the Corwin and Schultz (2012) Bid-Ask Spread measure, the Amihud (2002) measure, Zero Days Traded (the number of days in which a stock is not traded) and Turnover (traded volume divided by shares outstanding). Similarly, the data shows no significant changes in treated banks' risk profile, where I use the standard deviation of BHC stock returns to measure total risk and the residual standard deviations from the Fama-French four factor model and the Adrian, Friedman, and Muir (2015) Financial CAPM model to measure bank idiosyncratic risk. Finally, I find no evidence of changes in stock price responsiveness to market information, as measured by the delay variables of Hou and Moskowitz (2005).

Government Tail Risk Insurance An important question is whether the government provides different degrees of tail risk insurance to small and large banks. If this is the case, part of the discounts observed in treated bank value might just reflect a loss of government insurance, as opposed to reduced Fed monitoring. To test this hypothesis, I construct a daily version of the Gandhi and Lustig

(2015) risk factor capturing aggregate tail risk in US banks' stock returns. As discussed in their paper, this size factor is the normal risk-adjusted return on a portfolio that goes long in small bank stocks and short in large bank stocks, and represents a bank-specific risk factor orthogonal to other equity and bond factors. In the appendix, I test whether treated banks experience a change in their exposure to bank-specific tail risk after the treatment, where I measure this risk exposure as the quarterly loading of bank excess returns on the size factor. In practice, I repeat the usual exercise using each bank's quarterly loading on the size factor (the estimate from a quarterly time-series regression of daily bank excess returns on the daily size factor) as dependent variable. My results show no significant changes in deregulated banks' exposure to tail risk, and therefore to government tail risk insurance.

Leverage and Capital Requirements I finally analyze the treatment effect on leverage and capital ratios. The policy closely follows another Fed regulation relaxing the capital requirements of treated BHCs' parent companies (71-FR-9897). According to this regulation, the parent companies of BHCs with less than $500 million in total assets (i.e. the parent companies of treated BHCs) are exempted from regular capital requirements to finance levered acquisitions. Although unlikely (capital requirements exemptions are optional, and the banking subsidiaries of treated BHCs are still subject to regular capital requirements), there might be a concern that high leverage increases bank default risk, resulting in lower valuation.[30] The appendix shows that the leverage and the regulatory capital ratios of treated banks do not change after the treatment.

6 Conclusion

In this paper, I use a Fed policy relaxing the reporting requirements of a subset of US bank holding companies as a quasi-natural experiment to investigate the impact of financial supervision on bank shareholder value. The paper shows that Tobin's q and equity market-to-book of deregulated bank holding companies respectively fall by one and seven percent after the policy, and shows that this result is due to an increase in shareholder monitoring costs when regulatory supervision decreases. I

[30] As highlighted in main table of the paper, the value losses experienced by treated banks are not correlated with leverage and capital ratios.

show that, when supervision decreases, shareholder value losses can be attributed to increased monitoring expenditure and managerial rents, and that these losses are larger for bank holding companies with high cash flow risk and with non-bank subsidiaries.

From an economic standpoint, the paper shows that monitoring has a large impact on firm value, and demonstrates a positive role of regulation and supervision in reducing shareholder monitoring costs. From a policy standpoint, the paper provides an empirical counter-argument to the standing view that financial regulation negatively affects bank investors, especially in small and medium-sized banks. In this sense, future work should be aimed at measuring the contribution of agency frictions to the value discounts observed in very large banks (Minton et al. (2017)), and at quantifying the costs and benefits of financial regulation and supervision for the shareholders of these large, complex financial institutions.

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Figure 1

Common Trends in Pre-Treatment Bank Valuation

This figure reports a parallel trends diagnostic test on treated and control banks' Tobin's q (Panel A) and Market-to-Book (Panel B). I first divide the sample into two sub-samples, the pre-treatment sample before the first quarter of 2006 and the post-treatment sample starting with the first quarter of 2006. In each of these sub-samples, I run a kernel-weighted local polynomial regression to obtain a smoothed estimate of the trend component of valuation. The local polynomial regression uses an Epanechnikov kernel and the rule-of-thumb bandwidth suggested in Fan and Gijbels (1996). The figure reports point estimates and 95% confidence intervals of the trend component of treated and control banks' valuation as functions of the estimation quarter. Tobin's q and Market-to Book are defined as in Table 1.

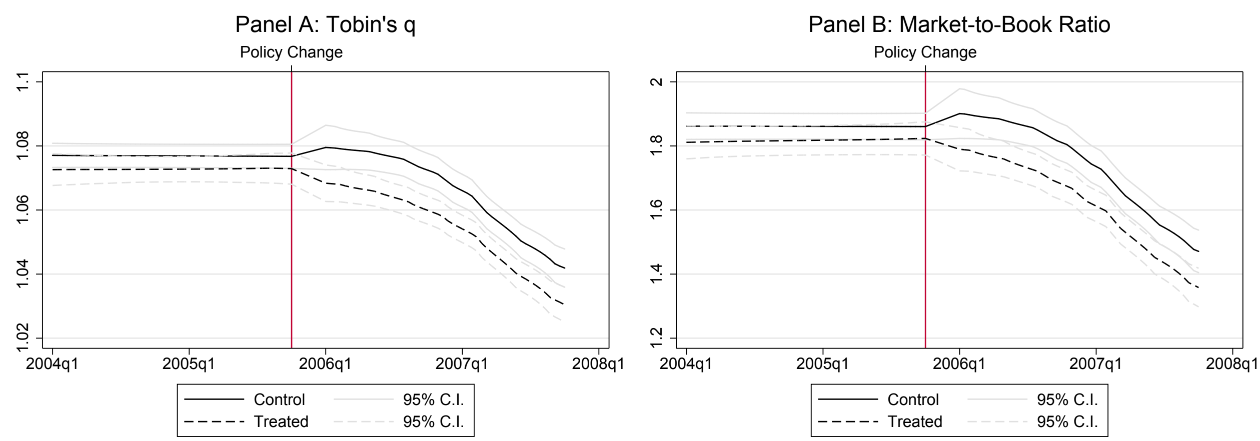

Figure 2

Bank Size Manipulation

This figure shows point estimates and 95% confidence intervals of the smoothed cross-sectional density of bank total assets during the 2005-2007 period (Panel A) and during the four quarters preceding the treatment (Panel B). The goal of the figure is to detect discontinuities indicative of size manipulation around $500 million. The smoothed densities are obtained by first constructing finely-gridded histograms of the cross-section of bank total assets, and by then smoothing the histograms on each size of the threshold using local linear regression. The optimal histogram bin size and local linear regression bandwidth are calculated using the procedure in McCrary (2008).

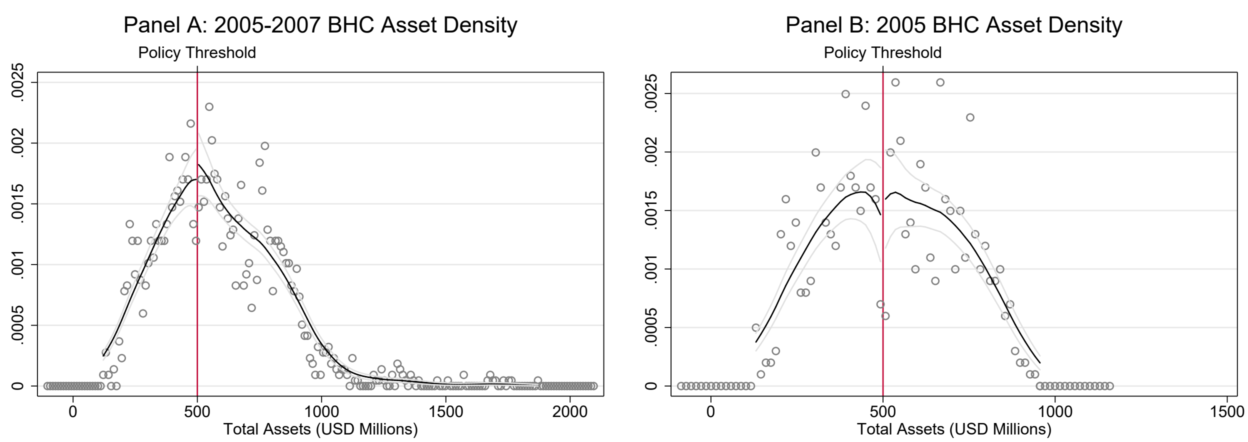

Table 1

Summary Statistics

This table reports summary statistics for the main variables used in the paper, both in the full sample and in the treated and control sub-samples. In Panel A, Tobin's q is the market value of total assets (market value of equity plus book value of debt) divided by the book value of total assets. Market-to-Book is the market value of equity divided by the book value of equity. Professional Services are fees paid to management consulting firms, investment banks, and auditing firms, in millions of US dollars. In Panel B, leverage is total liabilities divided by total assets, the Tier 1 Ratio is Tier 1 Capital divided by Risk-Weighted Assets, Profitability is net income divided by net interest income, and ROE is net income divided by book value of equity. Total Assets are reported in millions of US dollars. Diversification is non-interest income divided by net interest income, asset growth is quarterly growth in BHC total assets, and non-performing assets are non-performing assets divided by total assets (in percentage terms).

Panel A: Shareholder Value and Professional Expenditure

	Full Sample				Treated				Control			
	N	Mean	Med.	SD	N	Mean	Med.	SD	N	Mean	Med.	SD
Tobin's q	2,623	1.07	1.06	0.05	1,329	1.06	1.06	0.05	1,294	1.07	1.06	0.05
Market-to-Book	2,623	1.75	1.65	0.57	1,329	1.71	1.60	0.57	1,294	1.80	1.72	0.56
Professional Fees	1,756	0.14	0.10	0.16	862	0.13	0.10	0.14	894	0.16	0.12	0.18

Panel B: Additional Variables

	Full Sample				Treated				Control			
	N	Mean	Med.	SD	N	Mean	Med.	SD	N	Mean	Med.	SD
Leverage	2,624	0.91	0.91	0.03	1,329	0.91	0.91	0.03	1,295	0.91	0.91	0.02
Tier 1 Ratio	2,289	0.12	0.12	0.03	1,096	0.13	0.12	0.04	1,193	0.12	0.11	0.03
Total Assets	2,703	554.9	535.6	232.5	1,341	386.5	382.8	128.5	1,362	720.6	696.8	188.8
Profitability	2,701	0.23	0.26	0.34	1,340	0.20	0.24	0.44	1,361	0.25	0.27	0.19
ROE	2,624	0.02	0.03	0.03	1,329	0.02	0.02	0.03	1,295	0.03	0.03	0.02
Diversification	2,701	0.27	0.22	0.24	1,340	0.26	0.20	0.29	1,361	0.27	0.24	0.18
Asset Growth	2,655	0.03	0.02	0.06	1,308	0.03	0.02	0.06	1,347	0.03	0.02	0.05
Non–Performing	2,504	0.58	0.36	1.10	1,233	0.57	0.36	0.79	1,271	0.59	0.36	1.33

Table 2

The Policy Effect on Bank Shareholder Value

This table reports estimates of the treatment effect on bank valuation using the empirical specification in Equation (1). The coefficient associated with the "Post × Treated" interaction term captures the percentage change in treated bank valuation due to the treatment. The table includes year-quarter Fixed Effects (FE) and BHC FE. All the variables are defined as in Table 1.

	log Tobin's q			log Market-to-Book		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.010***	-0.011***	-0.011***	-0.074***	-0.083***	-0.078***
	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.02)
Leverage		0.337***	0.274***		5.640***	5.387***
		(0.12)	(0.10)		(0.81)	(0.67)
Tier 1 Ratio		0.381***	0.285***		2.573***	1.778***
		(0.08)	(0.07)		(0.52)	(0.49)
log Assets			-0.032***			-0.230***
			(0.01)			(0.05)
Non-Performing Assets			-0.001			-0.008
			(0.00)			(0.01)
Profitability			-0.004			0.037
			(0.00)			(0.03)
ROE			0.090**			0.267
			(0.04)			(0.48)
Diversification			-0.003			-0.050
			(0.00)			(0.04)
Asset Growth			-0.008			-0.040
			(0.01)			(0.07)
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.365	0.398	0.424	0.416	0.476	0.511
Observations	2,076	2,076	2,076	2,076	2,076	2,076

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table 3

Robustness and Placebo Tests: Market-to-Book

This table reports sample bandwidth selection tests (Panel A) and placebo tests (Panel B) on the main Market-to-Book result. In the first four specifications of Panel A, I use two small samples of BHCs with average 2005 total assets between \$400 and \$600 million (Specifications (1) and (2)), and between \$300 and \$700 million (Specifications (3) and (4)). In the last four specifications, I use two large samples of BHCs with total assets between \$150 million and \$1 billion (Specifications (5) and (6)), and between \$150 million and \$1.5 billion (Specifications (7) and (8)). In the first six specifications of Panel B, I use placebo asset thresholds of \$300 million, \$750 million, and \$1 billion to separate treated and control BHCs. In Specifications (7) and (8) I use the last quarter of 2004 as placebo treatment quarter, dropping post-2005 observations from the sample. In the last two specifications, I use the last quarter of 2006 as placebo treatment quarter. The dependent variable in all specifications is the natural logarithm of bank market-to-book. Unreported control variables include leverage, the Tier 1 Ratio, total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

Panel A: Sample Bandwidth Selection

	\$400M-600M		\$300M-700M		\$150M-1B		\$150M-1.5B	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Treated	-0.099***	-0.100***	-0.060**	-0.078***	-0.056**	-0.077***	-0.059***	-0.079***
	(0.04)	(0.04)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.165	0.364	0.110	0.306	0.069	0.257	0.057	0.220
Observations	340	340	696	696	1,256	1,256	1,546	1,546

Panel B: Placebo Tests

	\$300M Threshold		\$750M Threshold		\$1B Threshold		After 12/2004		After 12/2006	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post × Treated	-0.03	-0.03	0.01	-0.00	0.03	0.02	-0.00	0.00	-0.04	-0.05**
	(0.04)	(0.05)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.437	0.548	0.395	0.520	0.428	0.537	0.035	0.150	0.410	0.504
Observations	999	999	1,450	1,450	2,000	2,000	968	968	2,076	2,076

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table 4

The Policy Effect on Bank Professional Expenditure

This table shows the treatment effect on treated banks' professional expenditure. In the first three specifications I use the natural logarithm of professional fees as dependent variable, and in the last three specifications I use the natural logarithm of professional fees normalized by net interest income. Additional control variables not reported in the table include profitability, total assets, ROE, diversification, asset growth, and non-performing assets.

	log Professional Fees			$\log \frac{\text{Professional Fees}}{\text{Net Interest Income}}$		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	0.243**	0.254***	0.224***	0.210**	0.212**	0.213***
	(0.09)	(0.09)	(0.07)	(0.09)	(0.09)	(0.07)
Leverage		-1.685	-1.607		2.437	0.657
		(3.28)	(2.50)		(3.12)	(2.48)
Tier 1 Ratio		-4.468***	-2.096		-1.466	-1.240
		(1.54)	(1.32)		(1.49)	(1.31)
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.070	0.097	0.191	0.046	0.064	0.152
Observations	978	978	978	978	978	978

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table 5

Professional Expenditure Growth and Post-Treatment Value Losses

In this table I study the interaction between professional expenditure growth and post-treatment shareholder value losses in the treated and control groups. The term "Post × Prof. Fees" captures treated banks' professional expenditures that only occur after the treatment. Professional fees are normalized by net interest income. The unreported control variables include leverage, the Tier 1 Ratio, total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

Panel A: Treated Group

	log Tobin's q		log Market-to-Book	
	(1)	(2)	(3)	(4)
Prof. Fees	0.027	-0.029	0.327	-0.062
	(0.05)	(0.07)	(0.61)	(0.58)
Post × Prof. Fees	-0.127**	-0.111	-1.394**	-1.159**
	(0.06)	(0.08)	(0.57)	(0.53)
Controls	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes
R-Squared	0.345	0.454	0.430	0.531
Observations	860	719	860	719

Panel B: Control Group

	log Tobin's q		log Market-to-Book	
	(1)	(2)	(3)	(4)
Prof. Fees	-0.114	-0.146**	-0.634	-0.927*
	(0.08)	(0.06)	(0.63)	(0.51)
Post × Prof. Fees	-0.014	0.008	-0.295	-0.228
	(0.12)	(0.11)	(0.81)	(0.71)
Controls	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes
R-Squared	0.240	0.382	0.301	0.495
Observations	854	742	854	742

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table 6

Earnings Management During the Financial Crisis

In this table, I study the impact of Fed monitoring on bank funding costs and earnings management during the financial crisis. In Panel A, I study relative changes in treated banks' funding costs (total interest expense divided by total loans) and Loan Loss Provisions (normalized by total loans). In Panel B, I study the relative change in treated banks' Discretionary Negative Loan Loss Provisions during the financial crisis. These discretionary provisions are constructed following Kanagaretnam et al. (2014) as the absolute negative residual from a first-stage regression of LLP on previous-quarter loan loss allowance, current-quarter loan charge-offs to assets, loans to assets, non-performing loans to assets and change in total loans. I use both current-quarter (Specifications (1)-(3)) and previous-quarter (Specifications (4)-(6)) LLPs as dependent variables in the first-stage regression to construct Discretionary LLPs. The sample period is 2006-2008, and unmonitored banks are banks that are below the $500 million threshold for the entire sample period. Unreported controls include leverage, the Tier 1 Ratio, total assets, previous-quarter Tobin's q, diversification, asset growth, and non-performing assets.

Panel A: Funding Costs and Loan Loss Provisions

	log Funding Costs			log Loan Loss Provisions		
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis × Unmonitored	0.051**	0.044**	0.054**	-0.175	-0.208	-0.215
	(0.02)	(0.02)	(0.02)	(0.18)	(0.18)	(0.17)
Leverage Controls	No	Yes	Yes	No	Yes	Yes
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.676	0.727	0.758	0.383	0.389	0.416
Observations	873	873	873	723	723	723

Panel B: Discretionary Negative Loan Loss Provisions

	log Discretionary LLP-v1			log Discretionary LLP-v2		
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis × Unmonitored	0.610**	0.611**	0.731***	0.704***	0.699***	0.715***
	(0.25)	(0.25)	(0.27)	(0.24)	(0.24)	(0.26)
Leverage Controls	No	Yes	Yes	No	Yes	Yes
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.336	0.342	0.353	0.344	0.350	0.360
Observations	543	543	543	549	549	549

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table 7

Bank Risk and Shareholder Value Losses

In this table I study how the value of treated banks with high cash flow risk changes after the treatment, relative to the value of treated banks with low cash flow risk. Specifically, I assign banks to two groups of high (above-median) and low (below-median) cash flow risk, and then run a triple-differences specification where I study the treatment effect on high- and low-risk treated banks. In Specifications (1) and (2), I use monthly data from I/B/E/S to compute absolute differences between analyst consensus forecasts of one-year-forward bank EPS and the realized EPS values corresponding to these consensus forecasts. I then construct cash flow risk using quarterly averages of these monthly risk measures. In Specifications (3)-(4) and (5)-(6), I respectively use Equity Volatility and Tail Risk (both defined as in Table 5) as risk measures. The dependent variable in all specifications is equity market-to-book. Unreported control variables include leverage, the Tier 1 Ratio, total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

Dependent Variable: Market-to-Book						
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.033	-0.052**	-0.025	-0.035	-0.026	-0.029
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Post × High CF Risk	0.123***	0.104***				
	(0.04)	(0.04)				
Post × Treated × High CF Risk	-0.165**	-0.102*				
	(0.06)	(0.06)				
Post × High Eq. Vol.			0.071*	0.065		
			(0.04)	(0.04)		
Post × Treated × High Eq. Vol.			-0.121**	-0.106**		
			(0.06)	(0.05)		
Post × High Tail Risk					0.046	0.060
					(0.04)	(0.04)
Post × Treated × High Tail Risk					-0.104*	-0.111**
					(0.05)	(0.05)
Controls	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.429	0.519	0.423	0.516	0.421	0.516
Observations	2,076	2,076	2,076	2,076	2,076	2,076

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table 8

Bank Holding Companies with Non-Bank Subsidiaries

In this table I run a triple-differences specification to study the treatment effect on the value and professional expenditure of treated BHCs with one or more non-bank subsidiaries. The sample is restricted to the years 2005 and 2006. Unreported control variables include leverage, the Tier 1 Ratio, total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

	log Market-to-Book			log Prof. Fees		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.053	-0.051*	-0.060**	0.032	0.045	0.022
	(0.03)	(0.03)	(0.03)	(0.10)	(0.10)	(0.10)
Post × Non-Bank Subs.	0.014	0.046	0.046	-0.221**	-0.171*	-0.164
	(0.03)	(0.03)	(0.03)	(0.10)	(0.10)	(0.10)
Post × Treated × Non-Bank Subs.	-0.066	-0.091**	-0.080*	0.313**	0.270*	0.277*
	(0.05)	(0.04)	(0.04)	(0.14)	(0.15)	(0.15)
Leverage Controls	No	Yes	Yes	No	Yes	Yes
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.099	0.227	0.271	0.051	0.060	0.090
Observations	1,039	1,039	1,039	512	512	512

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

A Solving for the Optimal Contract

Substituting the agent's first incentive-compatibility constraint into (5)-(7), the problem becomes finding $m(y)$ and $\pi_1(y)$ to maximize

$$\begin{aligned}\mathcal{L} &= \int_{\underline{y}}^{\bar{y}} \left[P - m(y)\left(P - \pi_1(y) + k\right)\right] dF(y) - I + \omega \int_{\underline{y}}^{\bar{y}} \left[y - P + m(y)\left(P - \pi_1(y)\right)\right] dF(y) \\ &+ \int_{\underline{y}}^{\bar{y}} \left[\mu(y)\left[y - P + m(y)\left(P - \pi_1(y)\right)\right] + \lambda(y)\left[P - m(y)\pi_1(y)\right]\right] dy, \end{aligned} \quad \text{(A.1)}$$

where ω, $\mu(y)$, and $\lambda(y)$ respectively denote the multipliers on (6), (7), and (9). Taking first-order conditions of (A.1) with respect to $m(y)$ yields

$$\frac{\partial \mathcal{L}}{\partial m(y)} = \left[P - \pi_1(y)\right]\left[(\omega - 1) f(y) + \mu(y)\right] - kf(y) - \lambda(y)\pi_1(y). \quad \text{(A.2)}$$

If $m(y) = 1$, it must be that $\partial \mathcal{L} / \partial m(y) > 0$.[A.1] Therefore,

$$\left[P - \pi_1(y)\right]\left[(\omega - 1) f(y) + \mu(y)\right] > kf(y) + \lambda(y)\pi_1(y) \geq 0. \quad \text{(A.3)}$$

This implies that $R - \pi_1(y) > 0$ and $\lambda^*(y) = 0$. On the other hand,

$$\frac{\partial \mathcal{L}}{\partial \pi_1(y)} = f(y)(1 - \omega) - \mu(y), \quad \text{(A.4)}$$

implying that to satisfy $\partial \mathcal{L} / \partial \pi_1(y) \geq 0$, $\omega^* \leq 1$. Then from (A.3), $\mu(y) > 0$ and the limited-liability constraint must bind such that in the monitoring region $\pi_1(y) = y$.

[A.1] For a given $\hat{y}$, if $m(\hat{y}) = 1$ it must be that $\left(\mathcal{L}(m(\hat{y}) = 1) - \mathcal{L}(m(\hat{y}) = 0)\right) / (1 - 0) > 0$.

B Additional Results: Bank Value

Table B1

Robustness and Placebo Tests: Tobin's q

This table reports sample bandwidth selection tests (Panel A) and placebo tests (Panel B) on my main Tobin's q result. The Table is constructed as Table 3 in the main text.

Panel A: Sample Bandwidth Selection

	\$400M-600M		\$300M-700M		\$150M-1B		\$150M-1.5B	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Treated	-0.014**	-0.019***	-0.012**	-0.016***	-0.011***	-0.012***	-0.012***	-0.013***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.136	0.206	0.092	0.151	0.060	0.111	0.048	0.091
Observations	340	340	696	696	1,256	1,256	1,546	1,546

Panel B: Placebo Tests

	\$300M Threshold		\$750M Threshold		\$1B Threshold		After 12/2004		After 12/2006	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post × Treated	-0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00	-0.01*
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.394	0.470	0.339	0.411	0.361	0.435	0.054	0.158	0.356	0.412
Observations	999	999	1,450	1,450	2,000	2,000	968	968	2,076	2,076

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table B2

Bank Size Manipulation Tests

This table shows point estimates of discontinuities in the cross-sectional density of bank assets around the $500 million threshold, together with their associated *t*-statistics. The smoothed density is obtained by first constructing a finely-gridded histogram of BHC total assets and then smoothing the histogram on each size of the threshold using local linear regression. The reported tests are then Wald tests of the null hypothesis that the log difference in the smoothed density above and below the threshold is zero. The optimal histogram bin size and local linear regression bandwidth are calculated as in McCrary (2008).

	2005-2007 Sample	2005 Sample	2006-2007 Sample
Discontinuity Estimate	0.0737	0.110	0.0379
t-stat	0.674	0.522	0.330
Observations	2,039	692	1,347

Table B3

Event Study Around Policy Date

In this table I report the results of an event study around the policy implementation date (March 6, 2006). For each bank in the sample, I estimate the market model for the second half of 2005 by regressing daily bank stock returns on a constant and the daily CRSP value-weighted index. I then use the estimated coefficients to compute abnormal stock returns (the difference between realized returns and market-model-predicted returns) around the event date. I choose a symmetric event window starting two weeks before and ending two weeks after the week of the policy implementation. Next, I compute daily average abnormal returns in the treated and control groups, and then compute group-level Cumulative Abnormal Returns (CARs) as the sum of these daily average abnormal returns within the event window. I finally compute *t*-statistics (for the null hypothesis that CARs are zero) as the ratios between CARs and the standard deviations of average abnormal returns, normalized by the inverse of the square root of the number of days in the event window (see, for example, Corrado (2011)). In the last two columns of the table, I repeat the same exercise using weekly returns instead of daily returns.

	Daily Frequency		Weekly Frequency	
	Treated	Control	Treated	Control
Cumulative Abnormal Return	-0.0180	0.00264	-0.0139	0.00725
t-stat	-2.144	0.277	-3.315	1.189
Observations (Event Window)	24	24	5	5

Table B4

Additional Robustness: Sub-Sample Analysis

This table provides robustness tests for the main results in Table 2, using different restrictions on the main sample. In the first two specifications, I restrict the sample to 2005 and 2006. In Specifications (3) and (4), I extend the sample to include the financial crisis. In Specifications (5) and (6) I only include surviving BHCs (BHCs whose data is available for the entire 2004-2007 period). In Specifications (7) and (8), I drop banks that get listed on the stock market only after the treatment. The dependent variables are the natural logarithm of Tobin's q (Panel A) and the natural logarithm of Market-to-Book (Panel B). Unreported control variables include leverage, the Tier 1 Ratio, total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

Panel A: log Tobin's q Regressions

	2005-2006 Sample		2004-2008 Sample		Survivors Only		Listed in 2005	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Treated	-0.014***	-0.015***	-0.008*	-0.008**	-0.009**	-0.010**	-0.010***	-0.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.081	0.132	0.633	0.692	0.369	0.423	0.357	0.418
Observations	1,064	1,064	2,599	2,599	1,454	1,454	2,004	2,004

Panel B: log Market-to-Book Regressions

	2005-2006 Sample		2004-2008 Sample		Survivors Only		Listed in 2005	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Treated	-0.078***	-0.094***	-0.072**	-0.074**	-0.061**	-0.070**	-0.074***	-0.079***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.089	0.260	0.650	0.738	0.426	0.522	0.408	0.511
Observations	1,064	1,064	2,599	2,599	1,454	1,454	2,004	2,004

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table B5

Additional Robustness: Size Polynomials and State Fixed Effects

This table reports the results of additional robustness tests on the main result of Table 2. In Specifications (2)-(3) and (5)-(6), I augment the baseline specifications of Table 2 with third-degree polynomials on each side of the $500M threshold, controlling for possible non-linearities in the value-size relationship above and below the threshold. Specifically, for each BHC I construct a first distance variable that is equal to the difference between BHC size and $500M if this difference is positive and zero otherwise, and a second distance variable that is equal to the difference between $500M and BHC size if this difference is positive and zero otherwise. I then augment the baseline specifications with these two distance variables and their second and third powers. In Specifications (3) and (6), I include State Fixed Effects and State × Time Fixed Effects, controlling for potential clustering of treated and control BHCs in areas with different economic conditions. Unreported control variables include leverage, the Tier 1 Ratio, profitability, ROE, diversification, asset growth, and non-performing assets.

	log Tobin's q			log Market-to-Book		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.012***	-0.011***	-0.008*	-0.083***	-0.086***	-0.068***
	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)	(0.03)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Distance Polynomials	No	Yes	Yes	No	Yes	Yes
State FE	No	No	Yes	No	No	Yes
State × Year-Quarter FE	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.403	0.424	0.654	0.489	0.509	0.694
Observations	2,037	2,037	2,037	2,037	2,037	2,037

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table B6

Quarterly Treatment Effects

This table provides quarterly estimates of the treatment effect on bank value. The table is identical to Table 2, but here I assign an individual indicator to each post-treatment quarter. For example, the "Q1-2006 × Treated" indicator identifies observations for treated banks in the first quarter of 2006. All the variables are defined as in Table 1.

	log Tobin's q			log Market-to-Book		
	(1)	(2)	(3)	(4)	(5)	(6)
Q1-2006 × Treated	-0.010**	-0.011***	-0.010**	-0.060**	-0.066***	-0.063**
	(0.00)	(0.00)	(0.00)	(0.03)	(0.02)	(0.02)
Q2-2006 × Treated	-0.011**	-0.012***	-0.011***	-0.071**	-0.078***	-0.075***
	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.03)
Q3-2006 × Treated	-0.012***	-0.014***	-0.014***	-0.084***	-0.093***	-0.089***
	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.03)
Q4-2006 × Treated	-0.013***	-0.013***	-0.013***	-0.075**	-0.083***	-0.078***
	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.03)
Q1-2007 × Treated	-0.010**	-0.011***	-0.011**	-0.077**	-0.083***	-0.077***
	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.03)
Q2-2007 × Treated	-0.008*	-0.010**	-0.010**	-0.070*	-0.084**	-0.083***
	(0.00)	(0.00)	(0.00)	(0.04)	(0.03)	(0.03)
Q3-2007 × Treated	-0.009*	-0.010**	-0.010**	-0.079**	-0.085**	-0.077**
	(0.01)	(0.00)	(0.00)	(0.04)	(0.04)	(0.03)
Q4-2007 × Treated	-0.008	-0.008	-0.009	-0.081*	-0.090**	-0.082**
	(0.01)	(0.01)	(0.01)	(0.05)	(0.04)	(0.04)
Leverage		0.337***	0.275***		5.643***	5.390***
		(0.12)	(0.10)		(0.82)	(0.67)
Tier 1 Ratio		0.382***	0.286***		2.574***	1.781***
		(0.08)	(0.07)		(0.52)	(0.48)
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.366	0.399	0.424	0.417	0.476	0.511
Observations	2,076	2,076	2,076	2,076	2,076	2,076

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table B7

Falsification Tests: Non-Fed-Regulated Firms

In this table, I study whether firms that are not regulated by the Fed experience valuation discounts at the beginning of 2006. I first merge quarterly Compustat with the Fed Bank Regulatory dataset to identify and remove BHCs from the sample. I then identify non-BHC financial firms as firms with CRSP SIC code between 6000 and 6799. Finally, I remove observations of firms with less than $400 million and more than $600 million in 2005 average total assets, and use a $500 million asset threshold to classify firms as "small" (average 2005 assets below the threshold) and "large" (average 2005 assets above the threshold). In Panel A, I investigate valuation changes in the falsification sample of non-financial firms. In Panel B, I investigate valuation changes in the sample of non-BHC financial firms. Unreported control variables include leverage (book value of debt divided by book value of equity), quarterly operating investment (percentage change in quarterly operating assets, where operating assets are the sum of PP&E, trade receivables net of trade payables, deferred taxes and investment tax credit, and other current assets), interest coverage (operating income before depreciation divided by interest expense), profitability (operating income divided by revenues), and Return on Assets (operating income divided by total assets).

Panel A: Non-Financials

	log Tobin's q			log Market-to-Book		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Small Non-Fin.	-0.026	-0.042	-0.046	0.066	0.050	0.041
	(0.05)	(0.05)	(0.04)	(0.08)	(0.08)	(0.07)
log Assets		-0.185***	-0.197***		-0.288***	-0.304***
		(0.05)	(0.04)		(0.08)	(0.08)
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.161	0.190	0.225	0.139	0.165	0.226
Observations	3,459	3,459	3,459	3,268	3,268	3,268

Panel B: Non-BHC Financials

	log Tobin's q			log Market-to-Book		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Small Non-BHC	0.109	0.040	-0.032	0.131	0.112	0.040
	(0.20)	(0.19)	(0.15)	(0.20)	(0.18)	(0.15)
log Assets		-0.383*	-0.415*		-0.105	-0.164
		(0.20)	(0.20)		(0.18)	(0.17)
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.231	0.337	0.508	0.310	0.314	0.558
Observations	299	299	299	299	299	299

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

C Additional Results: Management Monitoring

Table C1

Audit Fees

In this table, I investigate the treatment effect on different components of bank professional expenditure, and in particular on audit fees. The data comes from annual AuditAnalytics (AA in the table). In Panel A, I show the treatment effect on AuditAnalytics audit fees, non-audit fees (the sum of employee benefit plan audits, due diligence and accounting related to mergers and acquisitions, internal control reviews, and other fees) and the difference between annual professional fees from Compustat and total annual fees (the sum of audit and non-audit fees) from AuditAnalytics. In Panel B, I scale the variables by annual net income from Compustat. Unreported control variables annual leverage, the Tier 1 Ratio, total assets, ROE, and diversification, defined as in Table 1.

Panel A: log Fees

	AA Audit Fees		AA Non-Audit Fees		Residual Prof. Fees	
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.029	-0.019	0.197*	0.207*	1.425***	1.306***
	(0.05)	(0.05)	(0.11)	(0.11)	(0.35)	(0.34)
Controls	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.415	0.470	0.020	0.044	0.182	0.232
Observations	894	894	855	855	218	218

Panel B: log Fees-to-Net Income

	AA Audit Fees		AA Non-Audit Fees		Residual Prof. Fees	
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.009	0.057	0.186	0.262**	1.316***	1.135***
	(0.10)	(0.07)	(0.15)	(0.13)	(0.38)	(0.42)
Controls	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.134	0.594	0.088	0.402	0.128	0.195
Observations	827	827	790	790	215	215

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table C2

Bank Ownership and Professional Expenditure

In this table I study the post-treatment interaction between bank ownership and professional expenditure. I first assign banks to two groups based on whether their pre-treatment ownership by the board chairman (or by the CEO) falls in the bottom two terciles or in the top tercile of the pre-treatment chairman (CEO) ownership distribution in my sample. In the table, I then study how different levels of pre-treatment chairman (CEO) ownership interact with changes in post-treatment professional expenditure. The estimates reported in this table only include data from 2005 and 2006. Quarterly bank ownership data comes from S&P Capital IQ. Unreported control variables include total assets, leverage, the Tier 1 Ratio, profitability, ROE, diversification, asset growth, and non-performing assets.

Dependent Variable: log Professional Fees						
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	0.185***	0.180**	0.172***	0.268***	0.263***	0.246***
	(0.06)	(0.08)	(0.06)	(0.06)	(0.10)	(0.07)
Post × High Chair Own.	-0.084	-0.141	-0.044			
	(0.11)	(0.30)	(0.24)			
Post × Treated × High Chair Own.	0.536***	0.670**	0.512*			
	(0.17)	(0.32)	(0.26)			
Post × High CEO Own.				0.252	0.171**	0.338***
				(0.16)	(0.08)	(0.09)
Post × Treated × High CEO Own.				-0.302	-0.115	-0.295*
				(0.21)	(0.26)	(0.18)
Leverage Controls	No	Yes	Yes	No	Yes	Yes
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.084	0.116	0.204	0.073	0.099	0.196
Observations	978	978	978	978	978	978

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table C3

Internal Controls and Post-Treatment Professional Expenditure

In this table I show that post-treatment professional expenditures by treated banks are mainly related to internal controls. I assign treated banks to one of two groups based on whether they mention (the Internal Controls (IC) group) or they do not mention (the No-IC group) internal controls as a source of professional expenditure in the notes to their 2006 and 2007 10-K filings. In the table, I provide an estimate of the treatment effect on professional expenditure on these two sub-groups of treated banks. Unreported control variables include total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

	log Professional Fees			$\log \frac{\text{Professional Fees}}{\text{Net Interest Revenue}}$		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated × No-IC	0.045	0.049	0.110	0.080	0.082	0.102
	(0.09)	(0.09)	(0.08)	(0.11)	(0.10)	(0.09)
Post × Treated × IC	0.384***	0.398***	0.283***	0.312***	0.310***	0.271***
	(0.11)	(0.10)	(0.09)	(0.11)	(0.11)	(0.10)
Leverage		-1.467	-1.174		2.711	0.930
		(3.15)	(2.40)		(3.11)	(2.48)
Tier 1 Ratio		-4.351***	-2.171*		-1.264	-1.294
		(1.51)	(1.29)		(1.52)	(1.36)
Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.094	0.121	0.192	0.050	0.067	0.144
Observations	904	904	904	904	904	904

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table C4

Summary Statistics: Funding Costs, Profitability, and Earnings Management

This table reports summary statistics for the dependent variables used in Section 4.3, both in the 2006-2008 sample and in the two sub-samples of banks with total assets below \$500 million and with total assets between \$500 and \$700 million (the "unmonitored" and "monitored" groups, respectively). In the table, LLP stands for Loan Loss Provisions, while DNLLP stands for Discretionary Negative Loan Loss Provisions (see Table 6). All the variables are constructed using data from quarterly Compustat Bank, and interest expense to total loans and LLP to total loans are expressed in percentage terms.

	2006-2008 Sample				Unmonitored				Monitored			
	N	Mean	Med.	SD	N	Mean	Med.	SD	N	Mean	Med.	SD
Int. Expense/Total Loans	1,129	1.02	0.99	0.32	625	1.01	0.98	0.36	504	1.02	1.00	0.27
LLP/Total Loans	1,129	0.13	0.05	0.27	625	0.13	0.05	0.29	504	0.13	0.05	0.25
DNLLP 1	645	0.07	0.05	0.06	359	0.07	0.05	0.06	286	0.06	0.04	0.06
DNLLP 2	651	0.07	0.05	0.06	364	0.07	0.05	0.06	287	0.07	0.04	0.06

Table C5

Funding Costs and Earnings Management: Robustness and Placebo

In this table, I present two sets of robustness test on the results of Table 6. In Panel A, I show changes in the funding costs (interest expense divided by interest income, Specification (1), and interest expense divided by total loans, Specification (2)), LLP (LLP to loans, Specification (3), and LLP to net interest income, Specification (4)), and Discretionary LLP (Versions 1 and 2 constructed as in Table 6, respectively reported in Specifications (5) and (6)) of unmonitored banks during the financial crisis, after restricting the sample to banks that survive for the entire 2006-2008 period. In Panel B, I use a placebo threshold of $400 million to separate monitored and unmonitored banks. Unreported controls include previous-quarter Tobin's q, leverage, the Tier 1 Ratio, total assets, diversification, asset growth, operating profitability, ROE, and non-performing assets.

Panel A: Surviving Banks

	Funding Costs		Loan Loss Provisions		Discretionary LLP	
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis × Unmonitored	0.035*	0.060**	-0.493**	-0.479**	0.537**	0.708***
	(0.02)	(0.02)	(0.19)	(0.24)	(0.24)	(0.24)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.586	0.760	0.451	0.588	0.386	0.393
Observations	636	636	428	428	409	417

Panel B: Placebo Sample with $400M Threshold

	Funding Costs		Loan Loss Provisions		Discretionary LLP	
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis × Small	0.014	0.031	-0.117	0.058	0.457*	0.559*
	(0.02)	(0.03)	(0.26)	(0.32)	(0.26)	(0.29)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.534	0.749	0.395	0.572	0.353	0.329
Observations	885	885	611	611	541	553

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

D Tests of Additional Hypotheses

Table D1

Voluntary Reporting

This table compares the treatment effect on Tobin's q (Panel A) and Market-to-Book (Panel B) across two sub-groups of treated BHCs. The first sub-group consists of treated BHCs that voluntarily file form FR Y-9C after the treatment. The second sub-group consists of treated BHCs that stop filing form FR Y-9C after the treatment. Unreported control variables include professional fees, total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

Panel A: log Tobin's q Regressions

	Voluntary Reporting			Not Reporting		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.013**	-0.013***	-0.014***	-0.011**	-0.012***	-0.011***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage		0.412***	0.333**		0.311**	0.233**
		(0.15)	(0.13)		(0.13)	(0.11)
Tier 1 Ratio		0.493***	0.369***		0.299***	0.193***
		(0.11)	(0.11)		(0.07)	(0.06)
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.366	0.409	0.431	0.358	0.380	0.414
Observations	1,351	1,351	1,351	1,837	1,837	1,837

Panel B: log Market-to-Book Regressions

	Voluntary Reporting			Not Reporting		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.090**	-0.096**	-0.092**	-0.083***	-0.090***	-0.080***
	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)
Leverage		6.001***	5.479***		5.386***	5.067***
		(0.94)	(0.87)		(0.92)	(0.73)
Tier 1 Ratio		3.039***	2.228***		2.123***	1.164***
		(0.72)	(0.75)		(0.49)	(0.43)
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.424	0.493	0.509	0.411	0.469	0.521
Observations	1,351	1,351	1,351	1,837	1,837	1,837

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table D2

Liquidity, Risk, and Market Frictions

In this table, I study the treatment effect on liquidity, risk, and market information responsiveness of treated banks' stocks. In Panel A, I report the treatment effect on the Holden (2009) Effective Tick Size, the Corwin and Schultz (2012) Bid-Ask Spread, and the Amihud (2002) liquidity measures (constructed as in the referenced papers). Moreover, I report the treatment effect on Zero Days Traded (number of days in which a stock is not traded) and Turnover (daily volume divided by shares outstanding). Effective Tick Size and Zero Days Traded are computed on a quarterly basis, while Bid-Ask Spreads, Amihud and Turnover are quarterly averages of daily measures. In Panel B, I show the treatment effect on quarterly return volatility, quarterly idiosyncratic volatility (IdVol) from the Fama-French four factor model (FF4), and quarterly idiosyncratic volatility from the Adrian et al. (2015) Financial CAPM model (FCAPM). In Specifications (7)-(10) I show the effect on quarterly measures of price responsiveness to market information (D1 and D2, as in Hou and Moskowitz (2005)). All the variables used in the table are constructed using daily stock returns from CRSP. The control variables in Panels A and B include leverage, the Tier 1 Ratio, total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

Panel A: Liquidity

	Effective Tick		CS Spread		Amihud		Zero Days		Turnover	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post × Treated	-0.000	-0.000	-0.002	-0.002	0.000	0.000	0.005	0.000	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.035	0.096	0.256	0.311	0.042	0.055	0.081	0.114	0.050	0.105
Observations	1,955	1,955	1,955	1,955	1,955	1,955	1,955	1,955	1,955	1,955

Panel B: Equity Volatility and Market Delay

	Total Vol		FF4 IdVol		FCAPM IdVol		D1		D2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post × Treated	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.049**	0.039*	0.208	0.151
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)	(0.41)	(0.40)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.215	0.271	0.211	0.265	0.208	0.263	0.019	0.036	0.012	0.019
Observations	1,955	1,955	1,955	1,955	1,955	1,955	1,955	1,955	1,955	1,955

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table D3

Government Tail Risk Insurance

In this table, I study the treatment effect on treated banks' exposure to bank-specific tail risk (Gandhi and Lustig (2015)). In each quarter from Q1-2004 to Q4-2008, I sort commercial bank stocks into five size portfolios based on their market capitalization at the end of the previous quarter. I compute daily value-weighted excess returns on each of the five size portfolios, and regress these daily excess returns on the Fama-French *market*, *hml* and *smb* risk factors (from Kenneth French's website), and two factors measuring bank interest rate risk (*ltg*, the yield on a 10-year treasury note minus the yield on a 2-year treasury note) and credit risk (*crd*, the Moody's Seasoned Aaa Corporate Bond Yield index minus the yield on a 10-year treasury note). The data used to construct *ltg* and *crd* comes from the Federal Reserve of St. Louis' website. I combine the residuals from the time-series regressions in a $(T_d \times 5)$ matrix (where T_d is the number of daily portfolio return observations for the period 2004-2007), and obtain the size factor as the second principal component of this matrix. The table shows the treatment effect on the quarterly loading of each bank's excess returns on the size risk factor. The loadings I use as dependent variables in the first three specifications come from the market model augmented with the bank size factor, while the loadings in the last three specifications come from the Gandhi-Lustig (GL) specification that includes the bank size factor and the other orthogonal factors (*market*, *hml*, *smb*, *ltg* and *crd*) as risk factors. The unreported liquidity controls include all the liquidity variables from Table D2, Panel A. The remaining unreported controls include leverage, the Tier 1 Ratio, total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

	Factor Loading (Market Model)			Factor Loading (GL Model)		
	(1)	(2)	(3)	(4)	(5)	(6)
Post $\times$ Treated	0.001	0.001	0.000	0.001	0.001	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Liquidity Controls	No	Yes	Yes	No	Yes	Yes
Other Controls	No	No	Yes	No	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.016	0.023	0.045	0.013	0.018	0.037
Observations	1,955	1,955	1,955	1,955	1,955	1,955

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.

Table D4

Leverage and Capital Ratios

In this table, I study the treatment effect on bank leverage and capital requirements. In Panel A, I study the treatment effect on three different measures of bank leverage, namely liabilities divided by total assets, liabilities divided by the book value of equity, and liabilities divided by total earning assets (the sum of cash and due from banks, assets sold under repurchase agreements, trading account securities, investment securities, loans net of loan loss allowance, customer acceptances, and other assets). In Panel B, I investigate the treatment effect on the Tier 1, Tier 2 and Combined (Tier 1 plus Tier 2) Capital Ratios of treated banks. The Tier 1 Ratio is the sum of equity capital and minority interests, divided by risk-weighted assets. The Tier 2 Ratio is the sum of cumulative preferred stock, qualifying debt, and allowance for credit losses minus investment in certain subsidiaries, divided by risk-weighted assets. Unreported control variables include total assets, profitability, ROE, diversification, asset growth, and non-performing assets.

Panel A: Leverage

	$\log \frac{\text{Liabilities}}{\text{Assets}}$		$\log \frac{\text{Liabilities}}{\text{Equity}}$		$\log \frac{\text{Liabilities}}{\text{Earning Assets}}$	
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	-0.001	-0.002	-0.013	-0.017	-0.002	-0.003
	(0.00)	(0.00)	(0.03)	(0.03)	(0.00)	(0.00)
Controls	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.011	0.051	0.015	0.082	0.035	0.128
Observations	2,379	2,379	2,379	2,379	2,379	2,379

Panel B: Capital Ratios

	log Tier 1 Ratio		log Tier 2 Ratio		log Combined Ratio	
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Treated	0.029	0.035	-0.065	-0.065	0.011	0.016
	(0.03)	(0.02)	(0.05)	(0.05)	(0.02)	(0.02)
Controls	No	Yes	No	Yes	No	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
BHC FE	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.029	0.178	0.047	0.054	0.061	0.176
Observations	2,077	2,077	2,062	2,062	2,100	2,100

Note: Standard errors (in parentheses) are clustered at the BHC-level. ***, **, and * respectively denote statistical significance at the 1%, 5%, and 10% levels.