The Effects of Supervision on Bank Performance: Evidence from Discontinuous Examination Frequencies

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Abstract

Previous research has found little evidence that banking supervision improves bank performance, possibly because supervision is endogenous to performance. This paper estimates causal effects of supervision on performance using discontinuities in the minimum frequency of examinations imposed by regulation. The bank asset size threshold at which these discontinuities occur changes over time, providing important variations both across banks and across time for identification. In particular, the time varying threshold allows us to remove confounding factors that may be present at certain asset sizes. We find that more frequent examinations increase profits and decrease loan losses and delinquencies. This is consistent with the hypothesis that regulators limit the risks that banks are exposed to and, consequently, limit their losses on risky assets. Our findings suggest that banking supervision improves bank performance.

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1 Introduction

Regulators supervise banks by employing major human and financial resources. In the United States, federal bank regulators allocate more than 10,000 people and more than $2 billion per year to supervision and related activities.[1] These resources have increased substantially in recent years in countries with developed banking industries, as regulators have complemented traditional micro-prudential supervision and regulation with a macro-prudential approach.[2]

Regulators employ such resources to supervise banks because policymakers support banking supervision, arguing that it helps banks to perform adequately. For instance, policymakers have maintained that supervision reduces the frequency and intensity of banking crises. President Barack Obama (2009) argued that one of the causes of the financial crisis of 2007-2008 was that "We were facing one of the largest financial crises in history and those responsible for oversight were caught off guard and without the authority to act." Federal Reserve Board Chairman Ben Bernanke (2010) affirmed one year after the Supervisory Capital Assessment Program (an early version of bank stress tests) that "our experience during the stress assessments also contributed to the development of tools and approaches that will inform our supervisory process as we work to reduce the likelihood of future financial crises." International Monetary Fund (IMF) Managing Director Christine Lagarde (2012) argued during the recent sovereign debt crisis in the European Union that, to prevent negative feedback effects between sovereign debts and banks, a "monetary union needs to be supported by financial integration in the form of unified supervision, a single bank resolution authority with a common backstop, and a single deposit insurance fund."

Despite being widely accepted, the idea that supervision improves bank performance conflicts with the empirical evidence. Levine (2005) summarizes the conclusions of his research about the effects of supervision across countries as follows (Barth, Caprio and Levine, 2004, 2006; Beck, Demirguc-Kunt and Levine, 2003, 2006): "For most countries, the data indicate that strengthening official supervisory powers will make things worse, not better. Unless the country is 'top ten'

[1]The federal commercial bank regulators are the Federal Deposit Insurance Corporation (FDIC), the Federal Reserve (Fed), and the Office of the Comptroller of the Currency (OCC). The number of employees and the funds allocated by these regulators to supervision stated above should be viewed as approximations, because they are often reported together with related activities, mainly banking regulation. The FDIC had 3,649 full-time equivalent employees in the Division of Supervision and Consumer Protection and actual expenditures of $787 million in its supervision and consumer protection program in 2010 (FDIC, 2011). The Fed is composed of the Federal Reserve Board (FRB) and the Federal Reserve Banks. The Federal Reserve Board had 627 employees and actual expenditures of $141.1 million on supervisory, regulatory, and legal services in 2010. The Federal Reserve Banks had a staff of 3,052 people and actual expenses of $802 million in supervision and regulation (FRB, 2011). The OCC had a total of 3,101 full-time equivalent employees and it spent $675 million exclusively in bank supervision in 2010 (OCC, 2010).

[2]In the United States, regulators have broadened the scope of supervision with new tools such as the Supervisory Capital Assessment Program in 2009, and new bodies, such as the Financial Stability Oversight Council in 2010. In the European Union, the scope and intensity of supervision have also increased, after it established the European Systemic Risk Board and the European System of Financial Supervisors in 2010.

in terms of the development of its political institutions, the evidence suggests that strengthening official supervisory powers hurts bank development and leads to greater corruption in bank lending without any compensating positive effects." Other papers investigate how regulators' supervisory actions and standards affect U.S. banks, but their results suggest mixed effects of supervision on performance (Peek and Rosengren, 1995; Peek, Rosengren and Tootell, 2003; Agarwal, Lucca, Seru and Trebbi, 2012).[3]

One possible reason why this literature has found little evidence that banking supervision improves bank performance is because supervision is endogenous to performance. Supervision is endogenous for three reasons: First, regulators must supervise riskier banks more carefully. For example, U.S. regulation requires that regulators examine riskier banks more frequently and it prohibits that federal and state regulators accept each other's examinations of riskier banks as substitutes for their own examinations. Second, regulators rate and treat banks more stringently as economic and industry conditions worsen, even if regulation does not require it (Berger, Kyle and Scalise, 2001; Curry, Fissel and Hanweck, 2008; Krainer and Lopez, 2009). Third, regulation responds to the performance of the banking industry as a whole. For example, the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) was enacted in 2010 in response to the crisis of 2007 and 2008, and it increased the scope and the intensity of supervision. Such endogeneity can be observed not only at the national level, but also across states within a country. For example, differences in bank performance across states in the U.S. have been found to determine the timing of branching deregulation, which had important consequences for supervision (Kroszner and Strahan, 1999).

In this paper, we estimate causal effects of banking supervision on bank performance using an empirical strategy that breaks the endogeneity between supervision and performance. We investigate how various performance measures of commercial banks are affected by the frequency of on-site safety and soundness examinations, which is the primary tool of banking supervision. Regulators examine banks to ensure that they perform adequately, and thus the more frequently a bank is examined, the healthier it should be. At the same, riskier banks are examined more frequently,

[3]Peek and Rosengren (1995) and Peek, Rosengren and Tootell (2003) find that a bank lends less when it is subject to supervisory actions and when it is poorly rated by regulators, respectively. These results, therefore, suggest that when regulators supervise a bank more rigorously, they may improve its regulatory capital ratios, which is a positive effect on performance, but mainly suggest that they curb its loan supply, which can be interpreted as a negative effect. Agarwal, Lucca, Seru and Trebbi (2012) study a sample of state banks that were examined alternately by federal and state regulators. They argue that federal regulators are less lenient than state regulators and that, as a consequence, in the intervals after an examination by a federal regulator and before an examination by a state regulator, banks report higher regulatory capital ratios, which may indicate a positive effect on performance, but they also report higher nonperforming loans, more delinquent loans, and lower return on assets, which may suggest a negative effect. However, the changes in these variables do not necessarily reflect a shift in bank performance, because, according to the authors, they are largely driven by more rigorous regulatory reporting by banks after examinations by federal regulators.

because regulators must monitor them more carefully. Thus, we need a strategy that breaks the endogeneity between examinations and performance to identify a causal effect of frequency of examinations on performance.

For this purpose, we use the minimum frequency of examinations of commercial banks imposed by law. The law requires that banks be examined at least once every 12 months, but they may qualify for a lower minimum frequency of once every 18 months if they are safe and sound and if their total assets are lower than a certain threshold. Because of the large difference between these two minimum frequencies and because of the asset thresholds, very similar banks can be examined at very different frequencies. This generates an exogenous source of variation in minimum examination frequencies, which we use to estimate the effect of examinations on bank performance using regression discontinuity designs (see Lee and Lemieux, 2010, for a survey). Moreover, the criteria for banks to qualify for a lower examination frequency have varied over time. In particular, the asset threshold was first established in 1991 at $100 million for banks rated either good or outstanding by regulators. This threshold increased to $250 million in 1994, and again to $500 million in 2006. These changes over time in the threshold, which are not often seen in regression discontinuity studies, provide important variations both across banks and across time. Importantly, it allows us to remove confounding factors that may exist at different asset sizes, similar to the "difference-in-discontinuity" framework of Grembi, Nannicini and Troiano (2013). Consequently, the causal effects of interest are more precisely estimated.

We find that more frequent examinations improve return on equity (ROE). Over the sample period of 1994 to 2012, reducing the interval between consecutive examinations by 100 days, which is roughly how much the average frequency of examinations jumps at the asset threshold, increases ROE by 1.68 percentage points. The effect of more frequent examinations on profitability is economically significant: the mean ROE over the sample period is about 12 percent. One interpretation of this results may be that when regulators examine a bank more often, they induce it to hold safer assets, which in turn reduces its losses – including loan losses – and increases its profits. This result is supported by the fact that the ratio of Net Interest Margin to Total Loans (NIM/TL) is not significantly affected by frequency of examination – because NIM/TL, unlike ROE, does not take balance sheet risks into account. So while more frequent examinations does not affect a bank's net interest income component of ROE, the losses on assets component is lower by more frequent examinations.

The effects of supervision on loan losses can be more directly analyzed by estimating the impact of the frequency of examinations on banks' ratios of non-performing loans to total loans (NPL/TL), ratios of charge-offs to total loans (CO/TL), and on provisions for loan and lease losses (PLLL/TL). We find that more frequent examinations reduce all three loan loss measures: over the sample period of 1994 to 2012, reducing the interval between examinations by 100 days leads to

a NPL/TL decrease of 0.64 percentage points, a CO/TL decrease of 0.09 percentage points, and a PLLL/TL decrease of 0.16 percentage points. These effects are again economically significant, particular that on NPL/TL, as the mean of NPL/TL over that sample period is about 1 percent (the means for both CO/TL and PLLL/TL are about 0.4 percent). We conduct several robustness tests and show that the main results continue to hold.

Besides the empirical literature on banking supervision and regulation, these results contribute to the theoretical literature on the topic. In these models, a principal, most often a government regulator, monitors banks to ensure that they perform adequately, and regulators can reduce bank risk by supervising banks more intensively, for instance, by examining these firms more frequently (Merton, 1978; Pyle, 1986; Campbell, Chan and Marino, 1992; Boot and Thakor, 1993; Giammarino, Lewis and Sappington, 1993; Bhattacharya, Plank, Strobl and Zechner, 2002; Weinberg, 2002; Pages and Santos, 2004; Kahn and Santos, 2005; Morrison and White, 2005, 2009). Our results support the assumption of these models that supervision reduces bank risk. Moreover, our results help to understand how regulators reduce risk, and thus they also help to evaluate other assumptions of these models. Some models assume that regulators reduce bank risk only by preventing risky banks to open or by closing risky or insolvent banks, instead of also lowering the risk of banks that remain open. Our results show that supervision also reduces the risk of existing banks, as proxied by the three loan loss measures we analyze.

This paper is organized as follows. Section 2 presents some background on bank examinations, including the rules that determine the frequency of examinations. Section 3 describes the data, Section 4 describes our empirical strategy, Section 5 presents the results and Section 6 concludes.

2 Background on Bank Examinations

2.1 Bank Examinations and Performance

Commercial banks fall into one of three possible combinations of regulators: state chartered banks that are also members of the Federal Reserve (Fed); state banks that are not members of the Fed; and national banks, which are chartered by the Office of the Comptroller of Currency (OCC) and must all be members of the Fed. Banks in all these categories are necessarily insured by the Federal Deposit Insurance Corporation (FDIC).[4] The chartering authority – either the respective state banking department or the OCC – is the primary regulator. The primary federal regulator is

[4]A fourth category, corresponding to state nonmember banks not insured by the FDIC, existed in the past but was eliminated as all states started requiring FDIC insurance from their chartered depository institutions and the FDICIA established extremely costly requirements for uninsured banks. However, even before these regulatory changes, FDIC insurance was considered very advantageous competitively, with only a few commercial banks choosing not to be insured. For this reason, this fourth category is not included in our analysis.

the OCC for national banks, the Fed for state member banks and the FDIC for state nonmember banks. National banks are supervised by the OCC and state banks are supervised both by their respective primary federal regulator and by their respective state.

Regulators supervise banks mainly by examining them on-site.[5] Regulators send teams of examiners to banks to investigate if these firms are safe and sound. When examiners visit a bank for a full scope safety and soundness examination, they evaluate six main areas: capital adequacy, asset quality, management, earnings, liquidity, and sensitivity to market risk. The initials of these components together form the CAMELS acronym.[6] The examiners then typically prepare a report where they discuss each of these components individually. Access to these reports is restricted to regulators.

Once examiners finish the examination, they discuss their findings with the bank's senior management and, when appropriate, with the bank's board of directors. Examiners also discuss with the bank how it can solve the problems that they identify. Next, based on examiners' report, regulators assign a rating to each of the six individual areas, the component CAMELS ratings, and assign a rating to the bank as a whole too, the composite CAMELS rating. These ratings range from 1 to 5, where 1 is assigned to banks that raise no supervisory concern and 5 is assigned to institutions that warrant immediate attention from regulators.

Regulators then meet with the bank to deliver a letter communicating the examination findings. In this meeting, regulators are typically represented by their senior staff and the bank is represented by its senior management, board of directors, and often by its chief executive officer or president. In the letter, regulators describe the bank's overall condition, they disclose and justify the ratings that they assigned, they analyze problems that require more attention from the bank, and they explain to the bank what it can do to solve or attenuate these problems. Depending on the bank's condition, regulators also discuss with the bank any informal or formal supervisory actions that they plan to take to correct problems at it.

Bank examinations, therefore, can affect bank performance through different channels. First, when regulators disclose and explain to the bank its CAMELS rating, the bank obtains useful information about how to manage its risks. In particular, regulators help the bank to address its weaknesses objectively, as they describe the areas that they evaluate in a safety and soundness review and explain how they assign the component and the composite ratings. Second, staff from the regulators and from the bank meet and communicate with each other frequently during an examination. Examiners ask for information and explanations from the bank and, at the end of their visit, they communicate their preliminary findings to it. This also helps the bank to understand what

[5] See for instance FDIC (1997), which contains the following statement: "The best way for supervisors to track the condition of banks is to conduct frequent, periodic on-site examinations of banks."

[6] The sixth component of CAMELS, sensitivity to market risk, was added in 1997.

regulators expect from it and how they evaluate it. Third, regulators can take supervisory actions against a bank, or an individual from its staff, which can have a strong impact on its performance.

2.2 Frequency of Examinations

Regulators are required to perform on-site examinations frequently. Since the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), federal regulators must examine banks every 12 to 18 months, depending on banks' characteristics. States also impose minimum frequencies of examinations by their banking departments on their state banks, but they are at most as strict as those imposed on federal regulators.[7] Thus, the rules on the minimum frequency of examinations by federal regulators impose a minimum on the frequency of examinations that a bank is subject to by any regulator.

The minimum frequency of examinations of banks are determined by six criteria: assets, capitalization, management, composite condition, acquisitions, and formal enforcement actions. Table 1 shows how these criteria evolved over time. These rules were first implemented in 1992, one year after the FDICIA was enacted. They state that banks must be examined at least once every 12 months, but banks that satisfied these six criteria qualified for an interval of up to 18 months. More specifically, in 1992, a bank qualified if it had total assets of less than $100 million, it was considered well capitalized (as defined in Table 1), it was found to be well managed in its most recent examination (although the Act did not define what is a well managed bank), it was assigned a composite CAMELS rating of 1 in its most recent examination, and it had not been acquired in the last 12 months.

[*TABLE 1 HERE*]

The Riegle Community Development and Regulatory Improvement Act of 1994 added a requirement that banks not be subject to a formal enforcement action from its Federal banking agency, but also extended the set of qualifying banks to those that were either assigned a rating of 1 and had at most $250 million in assets or were assigned a rating of 1 or 2 and had at most $100 million in assets. In 1997, this set was extended to banks rated 1 or 2 with up to $250 million in assets, and regulation defined a well managed bank as one that received a rating of 1 or 2 for the management component and for the composite CAMELS rating in its most recent examination. Finally, the Financial Services Regulatory Relief Act of 2006, increased the asset threshold to $500 million.

[7] Examinations by state and federal regulators can substitute each other for the purposes of meeting these minimum frequency requirements if the two parties participate in alternate examination agreements or if they can accept each other's examination reports as substitutes for their own.

The asset threshold in particular provides the discontinuity in the frequency of examination that we exploit: two banks that satisfy the capitalization, management, composite condition, acquisitions, and formal enforcement actions criteria, but lie on different sides of the asset threshold, should be subject to quite different examination frequencies. Furthermore, changes to the threshold over time provide another important source of variation that aids identification. For instance, banks that are larger than $250 million but smaller than $500 million will be subjected to the 12-month examination frequency in 2005, but 18-month frequency in 2006. The ways we exploit these changes are discussed in more depth in Section 4.

3 Data

The unit of observation in our data set is a commercial bank and year pair. Each bank-year pair includes variables that either come directly from year-end Call Reports, or are calculated using other variables from Call Reports. We use these variables as measures of performance, which are our dependent variables, and as variables that determine banks' minimum frequencies of examinations, which are termed as "assignment" variables in the regression discontinuity literature. ROE, NIM/TL, CO/TL, PLLL/TL, and NPL/TL measure bank performance.[8] Total assets is the first criterion in Table 1 that assigns banks to different minimum examination frequencies, and CAP, T1CAP, and leverage ratio (LEV) are part of the second criterion.

We add to the bank-year observations data on previous examinations at the respective bank. These data come from the Safety and Soundness Examinations table from the confidential National Information Center (NIC) of the Federal Reserve System, and they contain every safety and soundness examination of banks in the United States since 1989. We restrict the sample to on-site examinations of commercial banks from 1994 to 2012 with a valid CAMELS rating.[9] We use data on exam dates as measures of frequency of examinations. In particular, the number of days between the exit meeting dates of consecutive examinations at banks measures the time between examinations. We also use banks' CAMELS ratings and its various components as assignment variables. As can be seen from Table 1, the management component and the composite CAMELS ratings are the third and the fourth criteria for determining minimum examination frequency.

We also add to these data information on control relationships between the bank and other entities, and information on supervisory actions. We use information on relationships to create the variable that the fifth assignment criterion evaluates. This dummy variable is equal to one if there was a change in the control of the bank in the last two years and is equal to zero otherwise.[10] We

[8] We eliminate observations with NPL/TL, CO/TL and PLLL/TL above 100 percent.

[9] We restrict the data to examinations from 1994 or after to ensure that all examinations in the sample were subject to the changes introduced by the FDICIA, which became effective in December 1992.

[10] Although the acquisition criterion refers to the 12-month period in which a full-scope, on-site examination would

use data on supervisory actions for the sixth (and last) criterion in Table 1, which requires that the bank not be subject to formal enforcement actions to qualify for an 18-month interval. Data on bank relationships and on supervisory actions come from the Relationships and the Events tables from NIC, respectively.

In our regressions, we use the following subsample of banks. We keep in our sample only banks that satisfy the capitalization, management, composite condition, acquisitions, and formal enforcement actions criteria on Table 1 to qualify for an 18-month interval between examinations. We keep in our sample bank-year pairs that both fail and satisfy the total assets criterion in the respective year. Thus, total assets remains as the only active assignment variable in this subsample. Table 2 presents the summary statistics of these data divided by year and by whether the respective bank is below or above the asset threshold: for each year, we segment the set of banks into a group that is above the asset threshold (and thus must be subjected to the minimum frequency of 12 months) and one that is below (and thus qualifies for the 18-month interval). For each group, we present the cross-section mean and standard deviation of days between examinations one year ahead, the asset size in the present year, and the performance measures of interest two years ahead. Larger banks in general are examined more frequently and have higher ROE but lower NIM/TL. Interestingly, but perhaps not surprisingly, after the crisis in 2007, larger banks have higher NPL/TL and PLLL/TL relative to smaller banks. We also observe that smaller banks are overall better capitalized.

[*TABLE 2 HERE*]

4 Empirical Strategy

In this Section, we describe the strategy used to estimate the effects of bank examinations on various measures of bank performance. We first explain why estimates of these effects based on Ordinary Least Squares (OLS) would most likely be biased. Then, we present an alternative strategy that establishes a causal effect of examinations on performance using regulation on the minimum frequency of examinations. We conclude the Section by showing evidence that supports this strategy.

be required, the dummy covers a 24-month period because the first 12 months should be used to define the examination frequency for the remaining 12 months.

4.1 Estimator

Consider the following relationship between the frequency of examinations and bank performance:

$$Y_{i,t} = \beta D_{i,t-1} + \eta_i + \tau_t + \varepsilon_{i,t} \tag{1}$$

Where $Y_{i,t}$ is a measure of performance for bank i at the end of year t, and $D_{i,t-1}$ is the number of days between the exit meetings of the two most recent examinations at bank i as of December 31^{st} of year $t-1$. Thus, $D_{i,t-1}$ is an *inverse* measure of frequency of examinations, and we specify it as a lagged variable because examinations make impact over time rather than instantaneously. η_i is a bank fixed effect, τ_t is a year fixed effect, $\varepsilon_{i,t}$ is an unobservable shock on bank performance. We are interested in estimating β, the causal effect of $D_{i,t-1}$ on the bank performance.

If $Cov(D_{i,t-1}, \varepsilon_{i,t}) = 0$, then β can be consistently estimated by OLS. However, $D_{i,t-1}$ and $\varepsilon_{i,t}$ are likely correlated because of simultaneity between Y and D and because of omitted variables in equation (1). As discussed in Section 2, Y and D are simultaneous because examinations may improve bank performance, but poor performance makes regulators examine banks more frequently. Furthermore, $\varepsilon_{i,t}$ may include variables omitted from equation (1) that also partly determine $D_{i,t-1}$, such as the quality of bank management.

For these reasons, we use an alternative identification strategy. As previously discussed, regulators are required to examine each bank at least once every 12 or 18 months, depending on its characteristics. If the frequency of examinations at banks that are on a 12 month examination interval jumps discontinuously when these banks' characteristics satisfy the criteria set out in Table 1, and if some additional assumptions (which we discuss in the next subsection) hold, we can estimate the effects of examinations on performance by exploiting these exogenous discontinuities in minimum examination frequencies required by regulation.

Based on this reasoning, a function that takes the value of one when a bank satisfy the criteria in Table 1 (and zero otherwise) could be used as an excluded instrument for $D_{i,t-1}$. Define $Z_{i,t-2}$ as the vector of *assignment variables* which is used to assess whether the criteria are met. Z is lagged with respect to D because assignment to the 12-month or 18-month interval does not occur instantaneously – bank attributes in the current year will likely impact the examination planning and frequency in the following year. As shown in Table 1, these assignment variables could be closely proxied by total assets, three capital ratios, the management component of CAMELS, the composite CAMELS rating, a dummy variable indicating if the bank was acquired in the last two years, and a dummy variable indicating if the bank is subject to a formal enforcement action. Define Ω_{t-2} as the set of values of $Z_{i,t-2}$ that qualify banks i in year $t-1$ for an 18 month interval, which is defined in Table 1. The indicator function $1(Z_{i,t-2} \in \Omega_{t-2})$ can thus be used as an excluded instrument for $D_{i,t-1}$.

This instrumental variables framework constitutes a fuzzy regression discontinuity design that shares two characteristics with the frameworks in Angrist and Lavy (1999), van der Klaauw (2002), and Ferraz and Finan (2011). First, the causal variable of interest, $D_{i,t-1}$, is non-binary and takes many different values. Furthermore, compliance to the minimum examination frequency will unlikely be perfect due to logistical and other considerations.[11] Thus, it is important for us to use this variable directly instead of an indicator of whether a bank was "treated" with a higher examination frequency, as used in research that utilize "sharp" regression discontinuity designs. Second, multiple discontinuities exist, instead of a single one, as in most regression discontinuity designs. However, our analysis differ from the three papers cited above in that their multiple discontinuities exist contemporaneously, whereas in our case multiple discontinuities exist due to changes over time in the regulations that govern minimum examination frequencies (see Table 1).

Because Z has many elements, controlling flexibly for the effects of all elements in Z requires a large number of parameters to be estimated. As described in Section 3, we simplify the estimator by dropping in each year banks that fail *any* of the requirements for the lower examination frequency, except for total assets, $A_{i,t}$. Thus, total assets will be left as the *only assignment variable* in the remaining set of banks. Define c_t as the time-varying asset threshold. Within this sub-sample, the regulations would require that banks with $A_{i,t-2} \geq c_{t-2}$ to be examined at least once every 12 months, while banks with $A_{i,t-2} < c_{t-2}$ can be examined once every 18 months.

The time-varying asset threshold introduces more variations in the instrument, which may improve the precision of the estimates. Importantly, it may also be exploited to remove confounding factors that may exist at certain asset levels, similar to the "difference-in-discontinuities" framework in Grembi, Nannicini and Troiano (2013). Specifically, during the sample period of 1994-2012, two asset levels served as the asset threshold: \$250 million from 1994-2006, and \$500 million from 2007 and onwards. At each of these two asset levels, there may be factors that affect the outcome variables of interest that confounds the causal effect of $D_{i,t-1}$.[12] Figure 1 provides an illustration of the effect of interest, β, together with the confounding effects that are always present at \$250 million, α, and the confounding effects that are always present at \$500 million, γ. Using our sample period, which spans both years when \$250 million was the threshold and years when \$500 million was the threshold, we can estimate β by first estimating the jumps at the asset thresholds, and then differencing out (across time) the confounding effects.

[*FIGURE 1 HERE*]

[11] For instance, as can be seen in Table 2, the examination interval for an average bank to the right of the asset threshold is slightly longer than 12-months.

[12] For instance, the Basel capital regulations, which were initially introduced in the U.S. in the early nineties, could confound at these asset sizes.

The above estimation can be implemented using a Two-Stage Least Squares (TSLS) model:

$$Y_{i,t} = \beta D_{i,t-1} + \sum_{j=1}^{k} \theta_j A_{i,t-2}^j + \tilde{I}_{i,t-2} \sum_{j=0}^{\tilde{k}} \alpha_j \tilde{A}_{i,t-2}^j + \tilde{\tilde{I}}_{i,t-2} \sum_{j=0}^{\tilde{\tilde{k}}} \gamma_j \tilde{\tilde{A}}_{i,t-2}^j + \eta_i + \tau_t + \zeta_{i,t} \quad (2)$$

$$D_{i,t-1} = \delta I_{i,t-2} + \sum_{j=1}^{k} \psi_j A_{i,t-2}^j + \tilde{I}_{i,t-2} \sum_{j=0}^{\tilde{k}} \omega_j \tilde{A}_{i,t-2}^j + \tilde{\tilde{I}}_{i,t-2} \sum_{j=0}^{\tilde{\tilde{k}}} \pi_j \tilde{\tilde{A}}_{i,t-2}^j + \varphi_i + \upsilon_t + \xi_{i,t-1} \quad (3)$$

Where

$$\begin{aligned} I_{i,t} &\equiv 1(A_{i,t} \geq c_t) \\ \tilde{I}_{i,t} &\equiv 1(A_{i,t} \geq \$250 \text{ million}), \tilde{A}_{i,t} \equiv A_{i,t} - \$250 \text{ million} \\ \tilde{\tilde{I}}_{i,t} &\equiv 1(A_{i,t} \geq \$500 \text{ million}), \tilde{\tilde{A}}_{i,t} \equiv A_{i,t} - \$500 \text{ million} \end{aligned}$$

Allowing the outcome variables to respond flexibly to the assignment variable A is encouraged by Lee and Lemieux (2010), among others, so $k, \tilde{k}$ and $\tilde{\tilde{k}}$ are set to 4, 3 and 3, respectively, in our preferred specification. In a robustness test, we will increase these three parameters to verify whether our main results are sensitive to even more flexible specifications in A. φ_i, υ_{t-1} and $\xi_{i,t-1}$ are bank fixed effects, time fixed effects, and unobservable shocks, respectively, that partly determine $D_{i,t-1}$ in the first stage regression.

Note that α_0, the coefficient on $\tilde{I}_{i,t-2}$, and γ_0, the coefficient on $\tilde{\tilde{I}}_{i,t-2}$, are the confounding effects at \$250 million and \$500 million, respectively. Because we have one endogenous variable ($D_{i,t-1}$) and one instrument ($I_{i,t-2}$), TSLS estimation is identical to Instrumental Variables (IV) estimation.

The methodology in this paper is perhaps most closely related to those of Pettersson-Lidbom (2012) and Grembi, Nannicini and Toriano (2013). The first paper uses a fixed effects panel model that incorporates fuzzy regression discontinuity, with multiple thresholds providing an over-identified instrumental variables framework. We do not have over-identification since there is only one time-varying threshold. Our methodology to remove confounding effects is similar to the approach used in the second paper, although the setting of that paper is one in which the regression discontinuity is sharp rather than fuzzy.

As reflected by the setup, our empirical strategy recognizes that the assignment variables determine the frequency of future examinations, and it allows the frequency of examinations to affect bank performance over time. We capture the instrument at time $t-2$, and evaluate the causal effect of days between examinations at $t-1$ on the realization of the performance variables at t. As will be discussed in Section 5, this can be generalized to evaluate the impact of $D_{i,t-1}$ on $Y_{i,t+h}$, for $h \geq 1$.

4.2 Support for the Empirical Strategy

Like most regression discontinuity studies, our identification strategy imposes three assumptions: First, the probability that a bank is treated with more frequent examinations jumps whenever it crosses a threshold in the assignment variables. This also implies that the instrument has adequate variations around the threshold. Second, the distribution of bank characteristics other than the assignment variables is continuous at the thresholds of the assignment variables. Third, banks either cannot precisely control or do not intentionally manipulate their assignment variables at the thresholds. This means that the banks cannot precisely set their total assets to be just under the thresholds so as to avoid more frequent examinations. In this subsection, we examine if these three assumptions hold in our setting.

Figure 2 provides evidence that the frequencies of examination are discontinuous at the thresholds. Banks are placed into equally spaced bins by current year assets (horizontal axes, measured in natural logarithms of thousands of dollars). The vertical axes measures the average number of days between a pair of exams in the following year for banks in the bin. We expect this average number of days to jump at the solid red lines, is the active asset threshold. We also include the dashed red lines, which show the asset thresholds that are *not active*, as a placebo test.[13] Across different years, the average frequency of examinations is clearly discontinuous at the active asset threshold. While the small banks (those to the left of the threshold) are generally examined every 500 to 550 days, larger banks (those to the right of the threshold) are generally examined every 350 to 450 days. This provides support for the first assumption. It should be noted that while the Financial Services Regulatory Relief Act has an effective date of April 10^{th} 2007, the lower left graph in Figure 2 suggests that implementation was already underway in 2006.

[*FIGURE 2 HERE*]

Figure 3 shows the cross-section density of bank asset sizes for the same four years. There are no signs that the densities are discontinuous at the active threshold. According to Lee and Lemiuex (2010), the lack of discontinuity in the density of the assignment variable at the threshold can be taken as evidence that other bank characteristics also do not also jump at the threshold, and that banks either cannot precisely control or do not intentionally manipulate their asset size. Therefore, there is support for the second and the third assumptions of our identification strategy.

[*FIGURE 3 HERE*]

[13] The left red line is the $250 million threshold, while the right red line is the $500 million threshold.

5 Results

We are interested in two groups of variables that measure bank performance:

1. Profitability measures: Return on Equity (ROE) and Net Interest Margin as a percentage of Total Loans (NIM/TL).

2. Loan loss and delinquency measures: Non-Performing Loans as a percentage of Total Loans (NPL/TL), Charge-Offs as a percentage of Total Loans (CO/TL), and Provision for Loans and Lease Losses (PLLL/TL).

To the extent possible, we avoid dependent variables that are functions of total assets, such as return on assets, because total assets are an assignment variable, and because they enter extensively on the right hand side of our regressions as can be seem in equations (2) and (3). Although measures of bank capital adequacy, such as the risk-based capital ratio, tier 1 risk-based capital ratio, and the leverage ratio may also be affected by safety and soundness examinations, these measure are not included as outcome variables of interest. This is because they are part of the assignment variables $Z_{i,t}$, and as we simplify the estimation framework by leaving the banks' asset size as the only assignment variable, we have in effect already restricted our sample to adequately capitalized banks.

We do not include other covariates studied in the banking literature for two reasons. First, in the process of restricting the sample of banks to those that satisfy the requirement in Table 1 (except for asset size), we have already constrained the banks in our study to a reasonably homogeneous group: they all have good or outstanding CAMELS ratings, are adequately capitalized, were not acquired recently, and do not have any outstanding enforcement actions. Controlling further for other bank characteristics incremental to the fixed effects already included in the regression may not yield additional estimation benefits. Second, we believe that the flexible specification of the effect of total assets in our regression could approximate quite accurately the mean of the other determinants of the outcome variable, conditional on assets. As pointed out by Lee and Lemieux (2010) and Cellini, Ferreira and Rothstein (2010), this means that the exclusion of other covariates should not affect the identification of the causal effect of interest, as $\zeta_{i,t}$ in (2) should be mean independent of $A_{i,t-2}$.

5.1 Main Results

Tables 3 and 4 contain the results for each of the two groups of dependent variables. In each of these tables, Panel A presents the results from panel fixed effects OLS estimation of equation (1), with fourth order polynomial in $A_{i,t-2}$ added, while Panel B presents the results from the IV estimation of equations (2) and (3).

Before we discuss the main results, it is worth nothing that first stage regression (3), which is not separately reported in a table, estimates that δ to be **-98 days**. This estimate is highly statistically significant, and suggests that on average, a bank that has assets just to the left of the active asset threshold has an examination interval that is 98 days longer than a bank just to the right. This difference is quite large, and is consistent with the graphical evidence in Figure 2.[14]

[*TABLES 3 and 4 HERE*]

Profitability measures. Table 3 presents results on ROE and NIM/TL. According to Panel A, the OLS estimate of the effect of examination frequency on ROE is not statistically significant, and the economic significance is very small.[15] Under IV estimation, as shown in Panel B, more frequent examinations (i.e., smaller "Days between examinations") improves ROE, and the effect is both economically and statistically significant. Reducing the days between examinations by 100 days, which is roughly the average difference between banks on different sides of the threshold evident in both Figure 2 and the first stage regression, increases ROE by 1.68 percentage points. For the average bank in our sample, which has an ROE of around 12 percent, these change represents an 14 percent increase in ROE.

Neither OLS nor IV estimation find statistically significant effects of examination frequency on NIM/TL. Taken together with the findings on ROE, the combined results suggest that by examining banks more often, regulators encourage banks to reduce risk exposures by holding higher quality assets, which in turn reduces the loss recognition components of bank earnings and thus improves profitability as measured by ROE. On the other hand, net interest margin, which is another component of the banks' earnings, is not directly affected by losses on risky assets, and increased examination has a lesser impact on it. This could also suggest that impact of examinations is to assist banks in distinguishing the less risky loans from the more risky, even though they may be priced similarly. A similar interpretation could be that examinations help banks push their risk-return profile towards the efficient frontier.

Loan loss and delinquency measures. More direct analysis on whether more examinations reduces risk taking are carried out in Table 4. Again, OLS estimates in Panel A suggest that there is very little impact of more frequent examinations on the banks loan loss and delinquency measures. As we posited throughout the paper, this may be due to more frequent examination of banks

[14]The estimate is somewhat smaller than the differences in averages between the "above threshold" and "below threshold" groups, shown in Table 2. This suggests that the flexible specification of asset size included in the first stage regression explains part of the across group difference.

[15]Note that when regressors are endogenous, OLS inference tests whether the linear projection of the dependent variable on the regressor is statistically different from zero. The linear projections do not coincide with the causal effects or structural parameters.

that possess more risky assets, even if more examinations indeed reduces holdings of risky assets. Under IV estimation presented in Panel B, we find that more frequent examinations (i.e., smaller "Days between examinations") reduces NPL/TL, CO/TL, and PLLL/TL. The IV estimates are much larger in magnitude compared to the OLS estimates, and they are all highly statistically significant. For NPL/TL, which measures the amount of non-accrual and past due loans, a decrease in the interval between examinations of 100 days reduces NPL/TL by 0.64 percentage points. This effect is quite large, considering that the average bank in the sample has an NPL/TL 1 percent. For CO/TL, which measures the amount of loans that have been written off by the bank, the effect is 0.09 percentage points, which represents a 22 percent reduction in CO/TL for the average bank. Finally, for PLLL/TL, which measures the amount of expected losses, the effect is 0.16 percentage points, or a 38 percent reduction in PLLL/TL for the average bank.

These results are consistent with the hypothesis that regulators induce banks to hold safer assets by examining these firms more often. This is quite important, as the soundness of the asset side of the banks' balance sheets is arguably one of the most important goals of bank supervision.

5.2 Alternative Regression Specifications and Banks Near Thresholds

Our preferred regression specification in (2) and (3) is essentially a fourth order polynomial in assets, with cubic splines at \$250 and \$500 million. In Tables 4 and 5, we test the sensitivity of our results to this particular specification.

While our preferred specification is already quite general, sensitivity of estimation results to the polynomial specification should always be tested (see Lee and Lemieux (2010), for instance). In Table 5, higher order terms to the polynomial and the splines are added to the IV regressions, resulting in a fifth order polynomial in $A_{i,t-2}$ with quartic splines at \$250 and \$500 million. Since our identification strategy primarily focuses on the discontinuity at the asset thresholds, in Table 6 we show estimation results based on the banks that are quite close to the two asset thresholds. We construct this sample by keeping, for each year, banks that are within \$50 million both to the left and the right of the two thresholds, even if one of these two thresholds is not the active threshold. We do this to ensure that we have a cross-section to carry out estimation which removes confounding effects at these two asset levels. Because of the more restricted sample, we only include a linear polynomial in $A_{i,t-2}$ and linear splines at the thresholds, consistent with the literature that uses "local linear" estimation on observations around the discontinuity.

[*TABLES 5 and 6 HERE*]

The results in Panels A and B of Tables 5 confirm that our main results on ROE and the loan loss and delinquency measures (NPL/TL, CO/TL, and PLLL/TL) are robust to even more

flexible model specifications. In particular, introducing higher order terms in the polynomial and splines does not affect the results on ROE and the loan loss and delinquency measures by much at all. As can be seen in Table 6, constraining to sample to banks close to thresholds increases the magnitude of the effects for all outcome variables of interest, and in some cases the increases are quite large. Additional results not presented in tables suggest that changing the local linear estimation to include higher order polynomials or splines, or changing the bandwidth from $50 million to other sizes such as $25 million or $100 million, do not qualitatively affect the results. In any case, examination frequency remains a highly statistically and economically significant driver of ROE and the loan loss and delinquency measures under these alternative specifications.

5.3 National Banks

Our results so far were based on samples that included both national and state banks. However, national and state banks are subject to different supervisory frameworks. As described in Section 2, national banks are examined by the OCC only, while state banks are often subject to joint, concurrent, or alternating examinations by their respective federal and state regulators. Thus, the results that we have shown in this Section so far could in part be driven by examination policies, which also vary with bank characteristics, namely the charter. For instance, two regulators that conduct alternating examinations may have quite different impact on outcome variable, distorting the true effects of more frequent examinations.

To investigate this possibility further, in Table 7 we present estimation results based on a sample of only national banks, which are examined by the OCC and are not subjected to features such as alternating examinations. Thus, analysis on national banks is arguably free of effects of different standards being applied by different regulators (see Agarwal, Lucca, Seru and Trebbi, 2013, for more in depth discussion of different regulatory standards).

[*TABLE 7 HERE*]

Despite much smaller set of national banks and number of observations compared to the full sample (around 1,900 national banks, versus more than 7,500 total banks), the estimated effects of more examinations on the performance of national bank are remarkably consistent with those estimated using the full sample of banks. The effects of more examinations on loan loss and delinquency measures is slightly smaller for national banks: reducing the interval between examinations reduces NPL/TL by 0.42 percentage points, CO/TL by 0.07 percentage points, and PLLL/TL by 0.12 percentage points. The estimated effect on ROE is almost identical to that estimated based on all banks, although it is on the cusp of statistical significance at the 10 percent level. Based on these results, our main results do not appear to be driven by the structure of bank examinations and regulatory arrangements.

5.4 Effects of Bank Examinations at Longer Horizons

Thus far, our analysis has focused on measure the effects of more frequent examinations, one year ahead. In particular, our estimation has focused on assessing the causal effects of $D_{i,t-1}$ on $Y_{i,t}$. A natural question is whether the frequency of examinations $D_{i,t-1}$ can have effects on the outcome variables beyond year t, that is, $Y_{i,t+h}$ for $h \geq 1$. One may believe that there is an effect, because effects of bank supervision can take time to manifest, or because the effects of an examination may last longer than just the next year.

Because the "treatment" of more frequent examinations may be administered every year, under this "multiple treatment" environment one needs to be clear on what effects at longer horizons are of interest. In this regard, we estimate the "Intent-to-Treat" effects (ITT), as analyzed by Cellini, Ferreira and Rothstein (2010). The ITT can be interpreted as the effect of $D_{i,t-1}$ on $Y_{i,t+h}$ without controlling for the determination or assignment of the minimum frequency of examination in subsequent years (i.e., $D_{i,t}, D_{i,t+1},$ etc). One simple estimate of ITT could be to re-estimate (2) and (3), replacing $Y_{i,t}$ by $Y_{i,t+h}$. Table 8 reports the result of this estimation, for $h = 2$. That is, we estimate the effects of more frequent of examination on outcome variables, *three* years ahead.

[*TABLE 8 HERE*]

The results suggest that while bank profitability three years ahead is no longer affected by the frequency of examinations, loan loss and delinquency measures continue to respond to more frequent examinations. In particular, the effects of reducing the interval between examinations by 100 days, reduces NPL/TL by 0.43 percentage points and CO/TL by 0.08 percentage points. These three-year-ahead effects are smaller than the one-year-ahead effects, as we expected, but remain economically and statistically significant. These results show that more frequent examinations have longer lasting effects than just the following year.

6 Conclusions

In this paper, we estimated causal effects of banking supervision on bank performance using an identification strategy that exploits the discontinuities in the minimum frequency of bank examinations specified by federal regulations. We use a fuzzy regression discontinuity design in the fixed effects panel setting, which allows us to remove confounding effects by exploiting the feature that the bank asset threshold at which these discontinuities occur changes over time.

We show that on-site safety and soundness examinations improves bank performance, as more frequent examinations increase Returns on Equity and lowers several loan loss and delinquency measures. We also show that these results hold for both all banks and national banks only samples,

and that they are robust to different model specifications and constraints on the sample. The effects of more frequent examinations on loan loss and delinquency measures continue to be present at a longer horizon.

Our findings have important policy implications, as empirical support for the positive effects of banking supervision has been scarce so far, despite the large amount of human and monetary resources allocated to supervision related activities.

This paper leaves some important questions unanswered. By focusing on the effects of on-site examinations, which is a *microprudential* supervisory tool, we do not assess the potential impact of recent efforts that attempt to address the systemic effects of banks' safety and soundness. Thus, future work should investigate if such *macroprudential* supervision affects the financial system, including institutions that are not subjected to on-site examination or supervision. Furthermore, our identification strategy is the most effective when assessing the effects of bank examinations for banks that are at the asset thresholds of $250 million and $500 million. Therefore, our results may be less applicable to very small or very large institutions that are far away from these thresholds. Studying the impact of more rigorous supervision for very large banks, in particular, can add value to the growing literature on *too big to fail* institutions.

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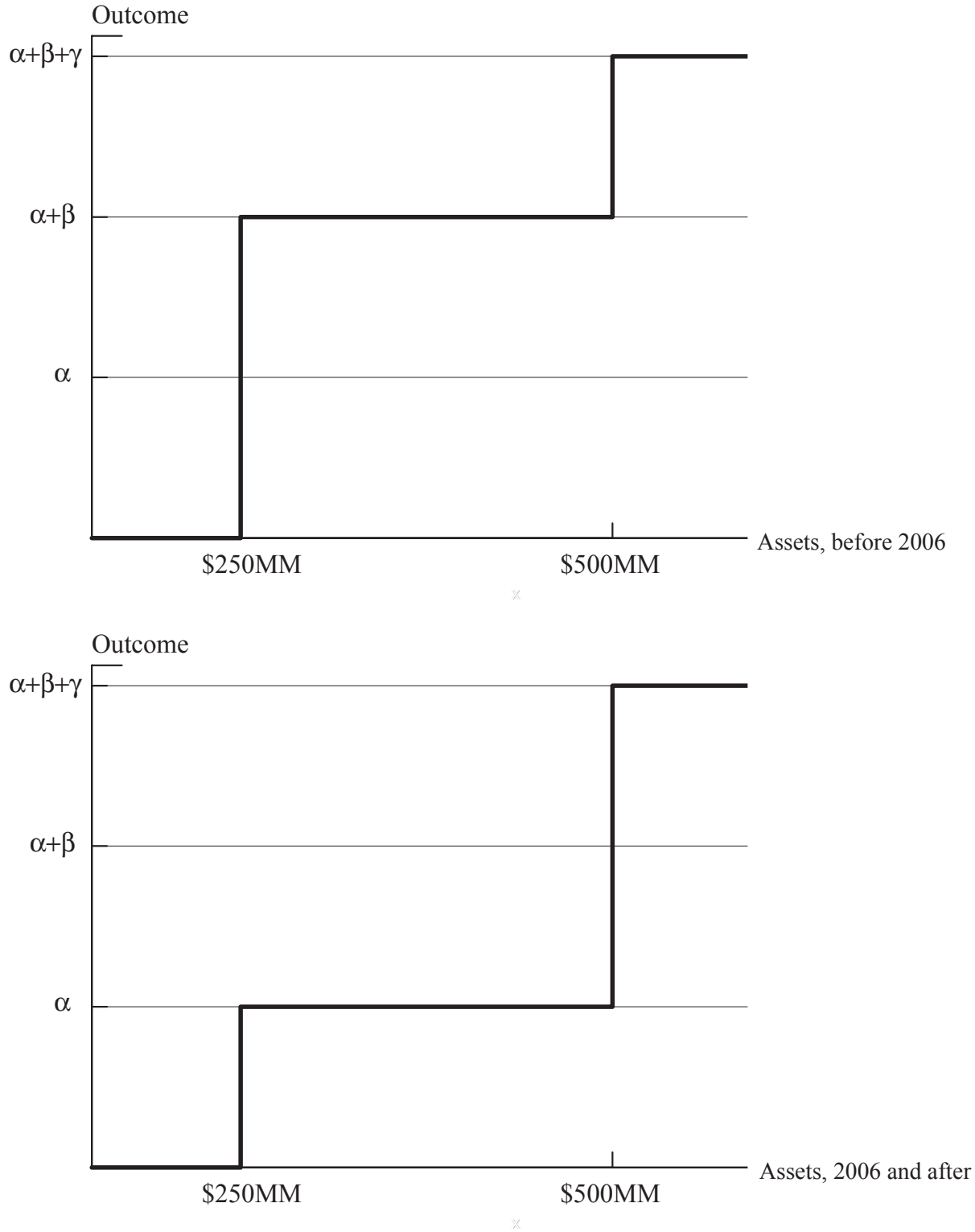


Figure 1: Illustration of the presence of confounding factors at $250 million and $500 million.

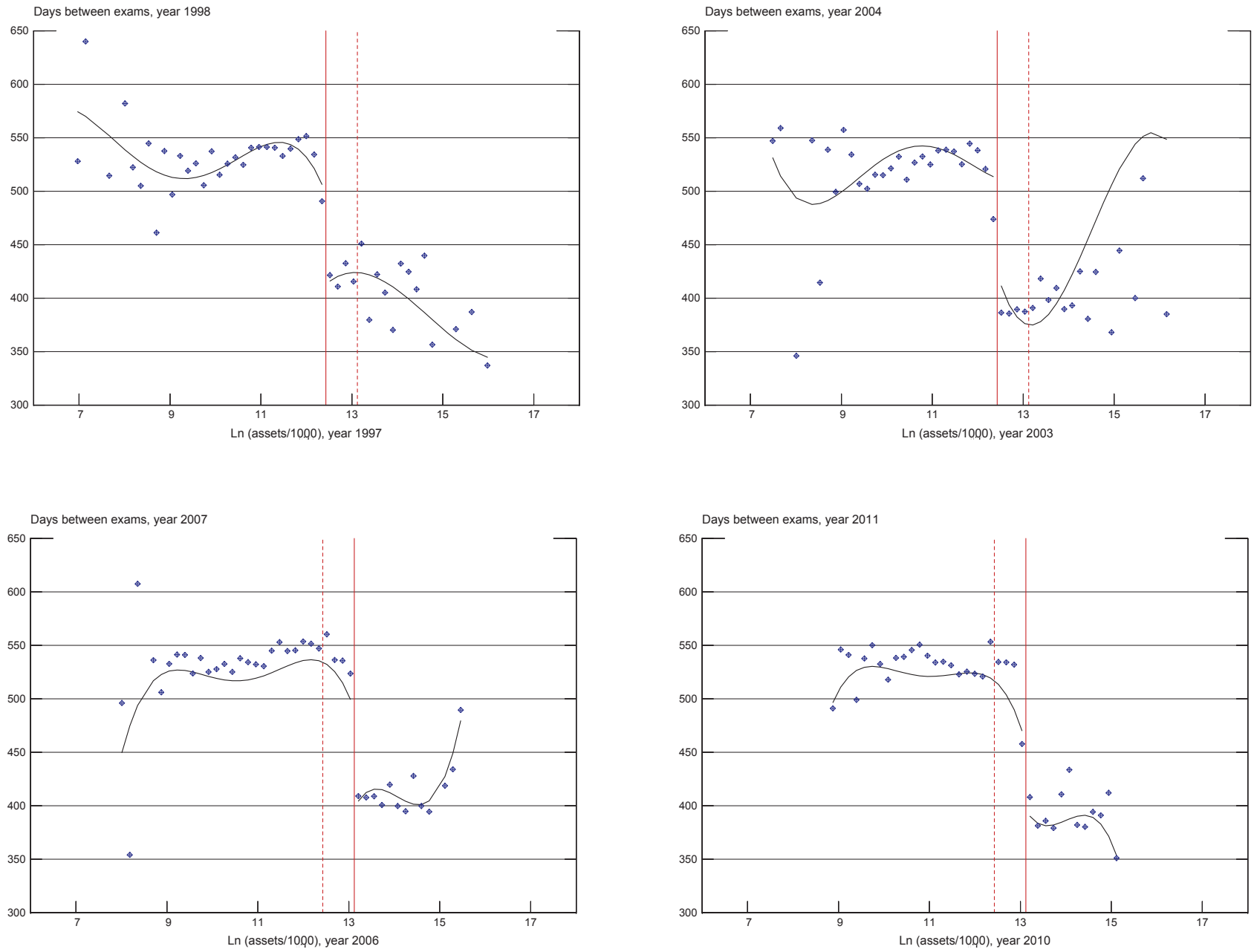
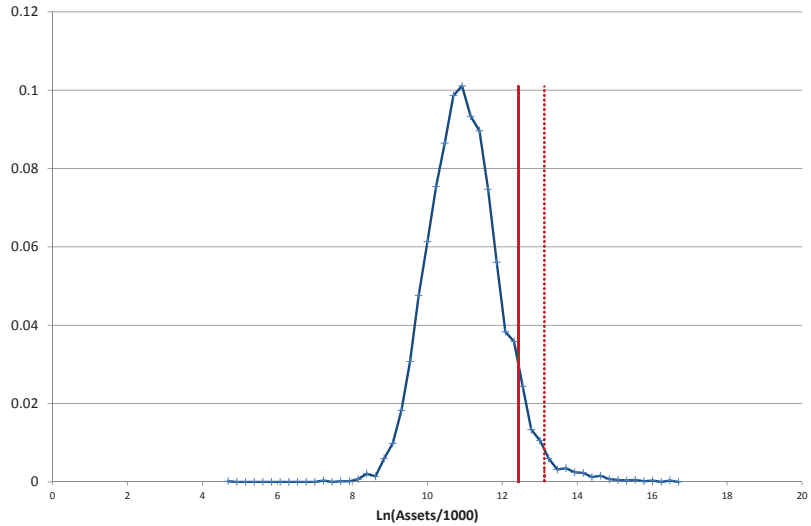
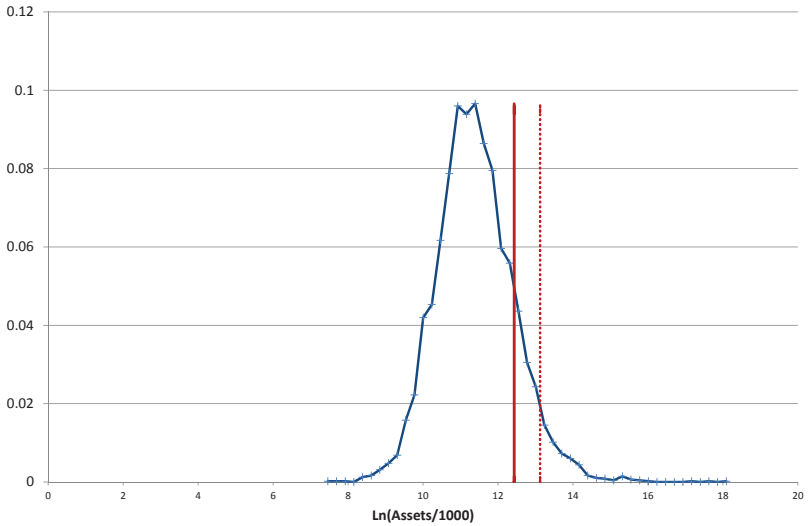


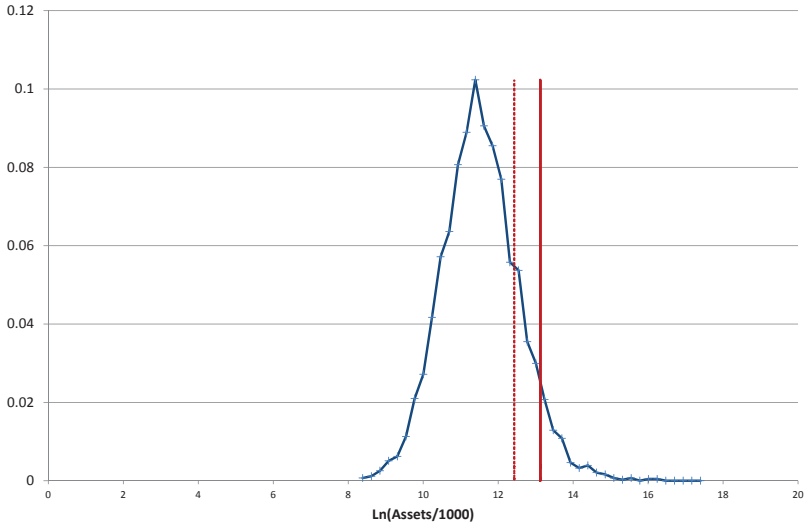
Figure 2: Average examination frequency as a function of previous year asset size.



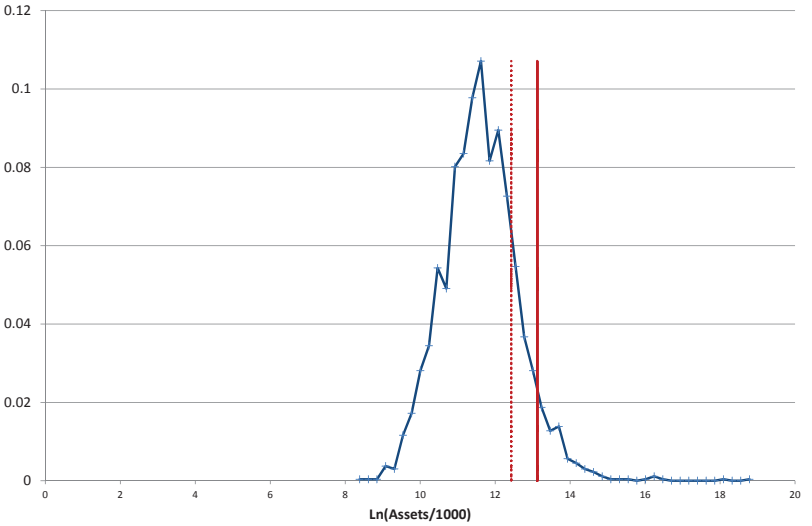
(a) 1997



(b) 2003



(c) 2006



(d) 2010

Figure 3: Cross-section density of asset size.

Table 1: Rules that govern the frequency of bank examinations

Regulation	Date of Enactment or Publication	Effective Date	Total Assets	Capitalization	Management	Composite Condition	Acquisition	Formal Enforcement Actions	Observations
Federal Deposit Insurance Corporation Improvement Act of 1991	12/19/1991	12/19/1992	**Less than $100 million**	**Well Capitalized (see observations 1 and 2)**	**Found to be well managed in the most recent examination**	**Found to be outstanding (Composite CAMEL rating of 1) in the most recent examination**	**No person acquired control of the institution during the 12-month period in which a full-schope, on-site examination would be required**		1. Section 38(b) of the Federal Deposit Insurance Act defined that an insured depository institution is Well Capitalized if it significantly exceeds the required minimum level for each relevant capital measure. 2. Section 325.103 was added to the FDIC Rules and Regulations on September 29, 1992, and became effective on December 19, 1992. It defined that an institution is Well Capitalized if it: (i) Has a total risk-based capital ratio of 10.0 percent or greater; and (ii) Has a Tier 1 risk-based capital ratio of 6.0 percent or greater; and (iii) Has a leverage ratio of 5.0 percent or greater; and (iv) Is not subject to any written agreement, order, capital directive, or prompt corrective action to meet and maintain a specific capital level for any capital measure.
Riegle Community Development and Regulatory Improvement Act of 1994	9/23/1994	9/23/1994	**Less than $250 million**	Well Capitalized (see observations 1 and 2)	Found to be well managed in the most recent examination	Found to be outstanding (Composite CAMEL rating of 1) in the most recent examination	No person acquired control of the institution during the 12-month period in which a full-schope, on-site examination would be required	Not currently subject to a formal enforcement action from its Federal banking agency	
			Less than $100 million		Found to be well managed in the most recent examination	**Found to be outstanding or good (Composite CAMEL rating of 1 or 2) in the most recent examination**	No person acquired control of the institution during the 12-month period in which a full-schope, on-site examination would be required	Not currently subject to a formal enforcement action from its Federal banking agency	
Interagency Interim Rule "Expanded Examination Cycle for Certain Small Insured Institutions"	1/24/1997	2/12/1997	**Less than $250 million**	Well Capitalized (see observations 1 and 2)	Received a rating of 1 or 2 for the management component and for the composite CAMELS rating at its most recent examination	**Found to be outstanding or good (Composite CAMELS rating of 1 or 2) in the most recent examination**	No person acquired control of the institution during the 12-month period in which a full-schope, on-site examination would be required	Not currently subject to a formal enforcement action from its Federal banking agency	3. Interim Rule was based on the Riegle Community Development and Regulatory Improvement Act of 1994 and the Economic Growth and Regulatory Paperwork Reduction Act of 1996. 4. The change in the management criterion was introduced by 12 CFR Part 225, Bank Holding Companies and Change in Bank Control (Regulation Y), published in Federal Register, Vol. 62, No. 40, Friday, February 28, 1997, which became affective on April 21, 1997. 5. The sixth component of the CAMELS rating, Sensitivity to Market Risk, was added in 1997. The change was puslished in the Federal Register on December 19, 1996, and became effective on January 1st, 1997.
Financial Services Regulatory Relief Act of 2006	10/13/2006	4/10/2007	**Less than $500 million**	Well Capitalized (see observations 1 and 2)	Received a rating of 1 or 2 for the management component and for the composite CAMELS rating at its most recent examination	Found to be outstanding or good (Composite CAMELS rating of 1 or 2) in the most recent examination	No person acquired control of the institution during the 12-month period in which a full-schope, on-site examination would be required	Not currently subject to a formal enforcement action from its Federal banking agency	6. Changes were implemented through jointly issued interim rules published on April 3, 2007 and effective on April 10, 2007 issued by the Federal Reserve Board (Board), the Federal Deposit Insurance Corporation (FDIC), the Office of the Comptroller of the Currency (OCC), and the Office of Thrift Supervision (OTS). The interim rule was adopted as final, without change, on September 11, 2007. (See 72 Fed. Reg. 54347, September 25, 2007.) The interim rules implemented section 605 of the Financial Services Regulatory Relief Act of 2006 (FSRRA) and Public Law 109-473.

Note: Bold text identifies changes in the criteria over time.

Table 2: Summary Statistics

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
								Banks above threshold									
Number of banks	236	269	334	340	393	447	504	548	599	617	644	676	187	172	144	148	146
Days Between Exams (mean)	392	434	421	420	407	412	399	396	394	396	397	465	403	406	399	408	399
Days Between Exams (s.d.)	96	97	108	89	84	77	88	100	122	118	115	140	79	90	88	90	75
Assets in $Millions (mean)	945	918	827	767	803	814	736	738	797	657	654	639	1,343	1,114	1,279	2,777	2,449
Assets in $Millions (s.d.)	2,036	2,230	1,850	1,698	1,908	1,984	1,720	1,846	3,562	1,538	1,653	1,842	3,942	1,453	1,899	13,707	12,959
ROE (mean)	14.8%	19.8%	15.8%	16.5%	14.7%	14.0%	14.3%	14.2%	13.7%	14.0%	13.6%	12.1%	6.6%	5.9%	9.0%	10.0%	10.6%
ROE (s.d.)	5.5%	77.6%	28.9%	18.5%	6.6%	7.5%	6.0%	6.2%	6.0%	6.6%	6.5%	5.9%	18.3%	10.5%	6.3%	5.4%	4.9%
NIM/TL (mean)	8.7%	9.5%	8.5%	7.6%	7.3%	7.4%	7.3%	6.4%	6.4%	6.1%	5.8%	5.4%	5.4%	5.9%	6.3%	6.6%	7.0%
NIM/TL (s.d.)	11.9%	13.9%	11.6%	10.0%	9.4%	11.0%	10.4%	6.9%	7.2%	5.8%	4.2%	4.1%	7.5%	8.0%	8.7%	8.7%	11.7%
NPL/TL (mean)	1.0%	0.8%	0.7%	0.6%	0.7%	0.8%	0.9%	0.8%	0.6%	0.6%	0.6%	1.0%	1.5%	2.1%	1.8%	1.6%	1.3%
NPL/TL (s.d.)	1.9%	0.7%	0.7%	0.7%	0.6%	0.8%	2.1%	0.8%	0.6%	0.7%	0.7%	1.3%	1.4%	1.8%	1.5%	1.3%	1.2%
CO/TL (mean)	0.6%	1.0%	0.6%	0.4%	0.3%	0.5%	0.4%	0.4%	0.3%	0.2%	0.2%	0.3%	0.5%	1.0%	0.8%	0.6%	0.4%
CO/TL (s.d.)	1.6%	6.7%	2.1%	0.7%	0.7%	1.9%	0.6%	0.6%	0.4%	0.4%	0.3%	0.4%	0.7%	1.1%	1.0%	0.7%	0.5%
PLLL/TL (mean)	0.5%	0.5%	0.5%	0.4%	0.4%	0.5%	0.5%	0.4%	0.3%	0.3%	0.2%	0.3%	0.7%	1.2%	0.9%	0.6%	0.4%
PLLL/TL (s.d.)	1.0%	1.9%	2.0%	0.6%	0.8%	2.3%	0.9%	0.6%	0.3%	0.4%	0.3%	0.4%	0.8%	1.3%	0.9%	0.5%	0.3%
CAP (mean)	17.3%	16.8%	16.4%	15.9%	15.0%	14.7%	14.7%	14.5%	14.4%	14.3%	14.0%	13.9%	13.7%	14.9%	15.7%	15.9%	16.1%
CAP (s.d.)	9.7%	8.3%	8.1%	7.6%	6.7%	8.2%	7.8%	6.2%	6.0%	5.8%	5.4%	5.0%	6.6%	10.9%	9.2%	6.5%	5.0%
T1CAP (mean)	15.9%	15.5%	14.9%	14.5%	13.7%	13.4%	13.4%	13.2%	13.2%	13.1%	12.8%	12.7%	12.5%	13.7%	14.3%	14.5%	14.8%
T1CAP (s.d.)	9.8%	8.4%	8.0%	7.4%	6.7%	8.2%	7.8%	6.1%	5.9%	5.8%	5.4%	5.1%	6.5%	11.0%	9.3%	6.7%	5.2%
LEV (mean)	9.8%	9.6%	9.3%	9.4%	9.2%	9.0%	9.0%	9.0%	9.0%	9.1%	9.3%	9.4%	9.4%	9.5%	9.7%	9.5%	9.6%
LEV (s.d.)	4.7%	4.4%	4.0%	4.3%	3.8%	2.9%	2.8%	2.6%	2.4%	2.3%	2.3%	2.4%	3.3%	3.8%	4.8%	2.9%	2.4%
								Banks below threhold									
Number of banks	4,713	4,738	4,759	4,614	4,433	4,261	4,120	3,960	3,722	3,565	3,374	3,184	3,338	2,784	2,375	2,234	1,418
Days Between Exams (mean)	457	498	530	537	528	529	519	523	524	530	534	537	547	555	547	544	531
Days Between Exams (s.d.)	115	117	114	105	94	103	105	96	95	90	84	82	84	82	88	87	88
Assets in $Millions (mean)	60	64	67	70	74	76	79	82	86	88	89	91	123	121	123	129	141
Assets in $Millions (s.d.)	48	50	52	53	54	55	57	58	58	59	59	58	102	99	100	103	112
ROE (mean)	12.0%	12.2%	11.9%	12.1%	11.7%	10.9%	11.2%	11.1%	11.3%	11.7%	11.3%	10.1%	7.3%	6.4%	8.4%	8.8%	9.5%
ROE (s.d.)	5.2%	5.6%	10.1%	6.5%	6.4%	6.4%	8.4%	6.4%	6.2%	7.1%	6.8%	7.3%	10.9%	9.9%	7.8%	6.2%	5.8%
NIM/TL (mean)	8.0%	7.7%	7.6%	7.3%	7.2%	6.9%	7.1%	6.8%	6.7%	6.7%	6.6%	6.5%	6.2%	6.5%	6.8%	6.9%	6.7%
NIM/TL (s.d.)	4.8%	4.8%	5.6%	5.2%	5.5%	5.3%	5.6%	5.0%	4.8%	4.9%	5.0%	5.5%	5.5%	5.6%	6.3%	6.0%	4.7%
NPL/TL (mean)	0.9%	0.9%	0.9%	0.8%	0.8%	0.9%	0.9%	0.9%	0.8%	0.8%	0.8%	1.0%	1.5%	1.6%	1.5%	1.3%	1.1%
NPL/TL (s.d.)	1.1%	1.1%	1.3%	1.1%	1.0%	1.1%	1.2%	1.2%	1.0%	1.0%	1.1%	1.3%	1.8%	2.3%	2.3%	2.0%	1.3%
CO/TL (mean)	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.3%	0.4%	0.6%	0.5%	0.4%	0.3%
CO/TL (s.d.)	0.5%	0.6%	1.2%	1.5%	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%	0.3%	0.4%	0.7%	0.8%	0.7%	0.5%	0.4%
PLLL/TL (mean)	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%	0.3%	0.3%	0.2%	0.2%	0.2%	0.5%	0.7%	0.5%	0.4%	0.3%
PLLL/TL (s.d.)	0.5%	0.5%	0.8%	1.5%	0.5%	0.5%	0.5%	0.5%	0.3%	0.4%	0.4%	0.4%	0.9%	0.9%	0.6%	0.5%	0.4%
CAP (mean)	20.7%	20.2%	20.0%	19.5%	19.2%	18.6%	18.5%	18.6%	18.5%	18.7%	18.3%	18.7%	18.1%	18.9%	20.0%	20.2%	20.3%
CAP (s.d.)	14.9%	16.4%	16.6%	15.6%	19.8%	18.5%	17.2%	17.2%	14.5%	22.6%	14.7%	16.8%	16.4%	18.3%	26.7%	17.6%	15.4%
T1CAP (mean)	19.5%	19.1%	18.8%	18.4%	18.1%	17.6%	17.4%	17.5%	17.4%	17.3%	17.2%	17.6%	17.1%	17.8%	18.9%	19.1%	19.2%
T1CAP (s.d.)	14.9%	16.4%	16.6%	15.6%	19.9%	18.6%	17.2%	17.3%	14.6%	14.9%	14.8%	16.9%	16.5%	18.4%	26.7%	17.6%	15.5%
LEV (mean)	10.7%	10.7%	10.7%	10.6%	10.7%	10.6%	10.5%	10.6%	10.6%	10.9%	11.1%	11.3%	11.1%	11.1%	11.2%	11.1%	11.0%
LEV (s.d.)	4.4%	4.1%	4.3%	4.3%	4.7%	4.6%	4.5%	4.4%	4.2%	4.2%	4.3%	4.8%	4.7%	4.8%	4.9%	4.8%	4.5%
								Relevant asset threshold in $Millions									
	250	250	250	250	250	250	250	250	250	250	250	250	250	500	500	500	500

Note: Table shows the mean and standard deviations of the variables of interest. Banks are assigned to "above threshold" or "below threshold" groups based on current year characteristics, "Days between exams" is recorded in the following year, and all other statistics are one year ahead performance measures. For instance, as determined in 1994, there are 236 banks above the $250MM asset threshold, which would require an examination every 12 months, while 4,713 are below, requiring an examination every 18 months. For the "above" group, the average number of days between exams is 392 in 1995, while the average ROE in 1996 is 14.8%. For the "below" group, the average number of days between exams is 457 in 1995, while the average ROE in 1996 is 12.0%. "ROE" is Returns on Equity; "NIM/TL" is Net Interest Margin as a percentage of Total Loans; "NPL/TL" is Non-Performing Loans as a percentage of Total Loans; "CO/TL" is Charge-Offs as a percentage of Total Loans; "PLLL/TL" is Provision of Loan and Lease Losses as a percentage of Total Loans; "CAP" is the risk-based Capital ratio; "T1CAP" is the Tier 1 risk-based Capital ratio; and "LEV" is the Leverage Ratio defined as Tier 1 Capital as a percentage of Total Assets.

Table 3: Profitability measures, all banks, years 1994-2012

	Panel A: OLS		Panel B: IV	
Dependent Variable	ROE	NIM/TL	ROE	NIM/TL
Days between examinations (hundreds of days)	-0.07%	0.00%	-1.68%	0.13%
	-1.59	0.18	-3.71	0.77
Assets	-50.48%	-89.88%	0.99%	0.25%
	-2.83	-5.93	1.84	0.31
Assets^2	7.39%	10.77%	-0.03%	-0.01%
	2.78	4.83	-2.22	-0.45
Assets^3	-0.45%	-0.59%	0.08%	0.23%
	-2.64	-4.10	0.09	1.18
Assets^4	0.01%	0.01%	-5.52%	0.37%
	2.42	3.58	-0.79	0.22
1(Assets ≥ \$250MM)			36.91%	-19.75%
			0.84	-0.30
(Assets - threshold) × 1(Assets ≥ \$250MM)			32.14%	-1.90%
			1.57	-0.34
(Assets - threshold)^2 × 1(Assets ≥ \$250MM)			-28.59%	5.29%
			-1.61	0.90
(Assets - threshold)^3 × 1(Assets ≥ \$250MM)			0.53%	-0.18%
			0.90	-0.57
1(Assets ≥ \$500MM)			-10.27%	-0.92%
			-1.39	-0.08
(Assets - threshold) × 1(Assets ≥ \$500MM)			5.12%	-5.51%
			0.93	-1.91
(Assets - threshold)^2 × 1(Assets ≥ \$500MM)			33.52%	-5.42%
			1.89	-0.76
(Assets - threshold)^3 × 1(Assets ≥ \$250MM)			29.18%	-5.23%
			1.64	-0.89
Bank fixed effects?	Yes	Yes	Yes	Yes
Time fixed effects?	Yes	Yes	Yes	Yes
Number of banks	7,557	7,557	7,557	7,557
Number of observations	67,198	67,198	67,198	67,198

Note: This table displays results of OLS regressions based on equation (1) (Panel A), and IV regressions based on equations (2) and (3) (Panel B). The "Assets" are measured in time t-2, "Days between examinations" are measured at t-1, and all dependent variables are measured at time t. The entire data set 1994-2012 is used. "ROE" is Returns on Equity and "NIM/TL" is Net Interest Margin as a percentage of Total Loans. Bank-level clustered T-statistics are shaded in grey.

Table 4: Loan loss and deliquency measures, all banks, years 1994-2012

	Panel A: OLS			Panel B: IV		
Dependent Variable	NPL/TL	CO/TL	PLLL/TL	NPL/TL	CO/TL	PLLL/TL
Days between examinations (hundreds of days)	0.02%	0.00%	0.01%	0.64%	0.09%	0.16%
	2.95	0.29	2.67	4.26	3.21	4.99
Assets	5.92%	1.44%	2.03%	36.76%	16.64%	9.98%
	1.87	0.33	0.60	4.11	2.84	1.88
Assets^2	-1.01%	-0.13%	-0.25%	-4.93%	-2.49%	-1.30%
	-2.33	-0.18	-0.46	-3.36	-2.62	-1.52
Assets^3	0.07%	0.00%	0.01%	0.28%	0.16%	0.07%
	2.72	0.03	0.31	2.67	2.42	1.20
Assets^4	0.00%	0.00%	0.00%	-0.01%	0.00%	0.00%
	-2.95	0.14	-0.13	-2.06	-2.22	-0.89
1(Assets ≥ $250MM)				0.35%	0.04%	0.05%
				2.79	1.04	1.52
(Assets - threshold) × 1(Assets ≥ $250MM)				-0.57%	0.15%	0.32%
				-0.46	0.28	0.75
(Assets - threshold)^2 × 1(Assets ≥ $250MM)				-2.68%	-1.00%	-3.01%
				-0.79	-0.53	-1.97
(Assets - threshold)^3 × 1(Assets ≥ $250MM)				4.62%	0.98%	3.57%
				1.51	0.50	2.27
1(Assets ≥ $500MM)				-0.14%	0.19%	0.05%
				-1.00	1.50	0.44
(Assets - threshold) × 1(Assets ≥ $500MM)				-2.25%	-0.68%	-1.85%
				-1.85	-0.68	-2.32
(Assets - threshold)^2 × 1(Assets ≥ $500MM)				-7.63%	-0.23%	-4.02%
				-2.24	-0.09	-2.07
(Assets - threshold)^3 × 1(Assets ≥ $250MM)				-4.51%	-1.01%	-3.62%
				-1.47	-0.51	-2.31
Bank fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Number of banks	7,547	7,547	7,547	7,547	7,547	7,547
Number of observations	67,101	67,101	67,103	67,101	67,101	67,103

Note: This table displays results of OLS regressions based on equation (1) (Panel A), and IV regressions based on equations (2) and (3) (Panel B). "Assets" are measured in time t-2, "Days between examinations" are measured at t-1, and all dependent variables are measured at time t. The entire data set 1994-2012 is used. "NPL/TL" is Non-performing Loans as a percentage of Total Loans, "CO/TL" is Charge-offs as a percentage of Total Loans, and "PLLL/TL" is Provision for Loan and Lease Losses as a percentage of Total Loans. Bank-level clustered T-statistics are shaded in grey.

Table 5: All banks, years 1994-2012, 5th order polynomial and quartic splines

	Panel A: Profitability		Panel B: Loan loss and delinquency		
Dependent Variable	ROE	NIM/TL	NPL/TL	CO/TL	PLLL/TL
Days between examinations (hundreads of days)	-1.68%	0.11%	0.64%	0.09%	0.16%
	-3.73	0.69	4.26	3.23	4.97
Assets	505.90%	950.54%	185.90%	-41.01%	-70.07%
	1.28	1.18	2.10	-0.60	-1.06
Assets^2	-115.81%	-219.31%	-38.39%	10.24%	16.46%
	-1.31	-1.23	-1.95	0.66	1.10
Assets^3	12.51%	24.09%	3.92%	-1.20%	-1.84%
	1.30	1.25	1.85	-0.71	-1.12
Assets^4	-0.65%	-1.28%	-0.20%	0.07%	0.10%
	-1.26	-1.27	-1.77	0.75	1.12
Assets^5	0.01%	0.03%	0.00%	0.00%	0.00%
	1.20	1.28	1.71	-0.77	-1.12
1(Assets ≥ \$250MM)	-0.32%	-0.12%	0.24%	0.04%	0.09%
	-0.41	-0.50	2.13	1.16	2.10
(Assets - threshold) × 1(Assets ≥ \$250MM)	1.68%	0.02%	1.44%	0.28%	-0.11%
	0.22	0.00	0.83	0.36	-0.14
(Assets - threshold)^2 × 1(Assets ≥ \$250MM)	-25.92%	-16.93%	-18.98%	-1.30%	0.90%
	-0.57	-0.84	-1.82	-0.25	0.20
(Assets - threshold)^3 × 1(Assets ≥ \$250MM)	102.56%	31.57%	41.39%	2.10%	-4.95%
	0.93	0.67	1.74	0.16	-0.49
(Assets - threshold)^4 × 1(Assets ≥ \$250MM)	-97.98%	-21.26%	-27.49%	-0.77%	6.41%
	-1.16	-0.59	-1.58	-0.07	0.84
1(Assets ≥ \$500MM)	0.83%	-0.25%	-0.07%	0.09%	-0.06%
	1.19	-0.68	-0.50	0.80	-0.74
(Assets - threshold) × 1(Assets ≥ \$500MM)	15.94%	-1.96%	0.90%	0.27%	-1.77%
	1.45	-0.37	0.47	0.16	-1.55
(Assets - threshold)^2 × 1(Assets ≥ \$500MM)	96.30%	5.82%	9.81%	-0.91%	-9.21%
	1.56	0.22	0.87	-0.11	-1.65
(Assets - threshold)^3 × 1(Assets ≥ \$500MM)	168.99%	26.03%	34.79%	0.65%	-12.26%
	1.33	0.49	1.41	0.04	-1.10
(Assets - threshold)^4 × 1(Assets ≥ \$500MM)	97.58%	20.44%	27.36%	0.76%	-6.40%
	1.15	0.57	1.58	0.07	-0.84
Bank fixed effects?	Yes	Yes	Yes	Yes	Yes
Time fixed effects?	Yes	Yes	Yes	Yes	Yes
Number of banks	7,557	7,557	7,547	7,547	7,547
Number of observations	67,198	67,198	67,101	67,101	67,103

Note: This table displays results of IV regressions based on equations (2) and (3). The "Assets" are measured in time t-2, "Days between examinations" are measured at t-1, and all dependent variables are measured at time t. The entire data set 1997-2012 is used. "ROE" is Returns on Equity, "NIM/TL" is Net Interest Margin as a percentage of Total Loans, "NPL/TL" is Non-performing Loans as a percentage of Total Loans, "CO/TL" is Charge-offs as a percentage of Total Loans, and "PLLL/TL" is Provision for Loan and Lease Losses as a percentage of Total Loans. Bank-level clustered T-statistics are shaded in grey.

Table 6: Banks within +/- $50MM of the thresholds, years 1994-2012

	Panel A: Profitability		Panel B: Loan loss and delinquency		
Dependent Variable	ROE	NIM/TL	NPL/TL	CO/TL	PLLL/TL
Days between examinations (hundreds of days)	-2.52%	-0.06%	0.73%	0.14%	0.19%
	-4.90	-0.29	4.74	2.95	3.25
Assets	-9.11%	-3.42%	2.57%	0.16%	0.73%
	-5.03	-2.93	5.96	0.34	3.72
1(Assets ≥ $250MM)	-0.72%	0.20%	0.13%	0.09%	0.05%
	-2.39	1.37	1.96	1.74	1.99
(Assets - threshold) × 1(Assets ≥ $250MM)	7.84%	3.41%	-2.00%	-0.12%	-0.48%
	3.88	2.24	-4.42	-0.26	-1.69
1(Assets ≥ $500MM)	-0.84%	-0.60%	0.00%	0.10%	0.02%
	-1.37	-1.61	0.00	1.76	0.34
(Assets - threshold) × 1(Assets ≥ $500MM)	2.60%	7.77%	0.80%	-0.37%	-0.75%
	0.28	1.13	0.40	-0.34	-1.08
Bank fixed effects?	Yes	Yes	Yes	Yes	Yes
Time fixed effects?	Yes	Yes	Yes	Yes	Yes
Number of banks	1,348	1,348	1,348	1,348	1,348
Number of observations	5,520	5,520	5,508	5,508	5,508

Note: This table displays results of IV regressions based on equations (2) and (3). The "Assets" are measured in time t-2, "Days between examinations" are measured at t-1, and all dependent variables are measured at time t. Restricted to banks that have Total Assets within +/- $50 million of the two asset thresholds. "ROE" is Returns on Equity, "NIM/TL" is Net Interest Margin as a percentage of Total Loans, "NPL/TL" is Non-performing Loans as a percentage of Total Loans, "CO/TL" is Charge-offs as a percentage of Total Loans, and "PLLL/TL" is Provision for Loan and Lease Losses as a percentage of Total Loans. Bank-level clustered T-statistics are shaded in grey.

Table 7: National banks only, years 1994-2012

	Panel A: Profitability		Panel B: Loan loss and delinquency		
Dependent Variable	ROE	NIM/TL	NPL/TL	CO/TL	PLLL/TL
Days between examinations (hundreds if days)	-1.69%	-0.09%	0.42%	0.07%	0.12%
	-1.62	-0.59	3.74	1.85	2.77
Assets	-1070.88%	1758.70%	126.58%	55.89%	84.59%
	-1.30	2.21	1.41	1.18	1.92
$Assets^2$	148.31%	-249.84%	-18.60%	-8.25%	-12.06%
	1.25	-2.23	-1.45	-1.23	-1.94
$Assets^3$	-9.03%	15.64%	1.20%	0.53%	0.76%
	-1.21	2.25	1.48	1.27	1.94
$Assets^4$	0.20%	-0.36%	-0.03%	-0.01%	-0.02%
	1.17	-2.26	-1.50	-1.29	-1.94
1(Assets ≥ $250MM)	2.63%	0.42%	0.45%	0.02%	0.07%
	0.90	1.93	2.49	0.52	1.53
(Assets - threshold) × 1(Assets ≥ $250MM)	-32.62%	1.46%	-0.04%	0.51%	0.23%
	-1.42	0.60	-0.02	0.92	0.36
$(Assets - threshold)^2 \times 1(Assets \geq \$250MM)$	93.45%	9.72%	-2.53%	-2.10%	-1.45%
	1.58	1.33	-0.38	-1.03	-0.61
$(Assets - threshold)^3 \times 1(Assets \geq \$250MM)$	-83.99%	-1.43%	4.90%	3.11%	2.73%
	-1.66	-0.21	0.79	1.48	1.14
1(Assets ≥ $500MM)	1.95%	0.30%	-0.07%	0.04%	-0.01%
	1.31	1.18	-0.35	0.45	-0.08
(Assets - threshold) × 1(Assets ≥ $500MM)	21.22%	0.56%	-2.60%	-1.76%	-1.66%
	1.36	0.18	-1.26	-2.06	-1.71
$(Assets - threshold)^2 \times 1(Assets \geq \$500MM)$	77.74%	2.22%	-7.24%	-3.82%	-4.08%
	1.57	0.29	-1.12	-1.50	-1.46
$(Assets - threshold)^3 \times 1(Assets \geq \$500MM)$	81.18%	7.35%	-4.37%	-3.01%	-2.44%
	1.63	1.10	-0.71	-1.42	-1.02
Bank fixed effects?	Yes	Yes	Yes	Yes	Yes
Time fixed effects?	Yes	Yes	Yes	Yes	Yes
Number of banks	1,887	1,887	1,885	1,885	1,885
Number of observations	15,589	15,589	15,566	15,566	15,566

Note: This table displays results of IV regressions based on equations (2) and (3). Only national banks are included. The "Assets" are measured in time t-2, "Days between examinations" are measured at t-1, and all dependent variables are measured at time t. The entire data set 1994-2012 is used. "ROE" is Returns on Equity, "NIM/TL" is Net Interest Margin as a percentage of Total Loans, "NPL/TL" is Non-performing Loans as a percentage of Total Loans, "CO/TL" is Charge-offs as a percentage of Total Loans, and "PLLL/TL" is Provision for Loan and Lease Losses as a percentage of Total Loans. Bank-level clustered T-statistics are shaded in grey.

Table 8: All banks, years 1994-2012, 3-year ahead performance

	Panel A: Profitability		Panel B: Loan loss and delinquency		
Dependent Variable	ROE	NIM/TL	NPL/TL	CO/TL	PLLL/TL
Days between examinations (hundreds if days)	-0.03%	0.17%	0.43%	0.08%	0.04%
	-0.10	1.27	2.36	2.18	1.22
Assets	70.70%	-9.85%	13.58%	6.39%	2.52%
	1.37	-0.17	1.33	1.30	0.60
Assets^2	-12.67%	3.21%	-1.49%	-0.81%	-0.35%
	-1.46	0.32	-0.86	-0.96	-0.49
Assets^3	1.00%	-0.33%	0.06%	0.04%	0.02%
	1.60	-0.43	0.45	0.67	0.36
Assets^4	-0.03%	0.01%	0.00%	0.00%	0.00%
	-1.77	0.52	-0.10	-0.40	-0.19
1(Assets ≥ $250MM)	0.38%	-0.06%	0.15%	-0.06%	-0.02%
	0.95	-0.32	0.94	-1.37	-0.43
(Assets - threshold) × 1(Assets ≥ $250MM)	4.41%	-0.84%	0.10%	0.90%	0.35%
	1.08	-0.60	0.09	2.07	0.77
(Assets - threshold)^2 × 1(Assets ≥ $250MM)	2.15%	-4.79%	-4.23%	-3.98%	-2.58%
	0.15	-1.17	-1.28	-2.97	-1.67
(Assets - threshold)^3 × 1(Assets ≥ $250MM)	-3.74%	5.68%	5.13%	3.64%	2.89%
	-0.26	1.40	1.65	2.66	1.96
1(Assets ≥ $500MM)	0.25%	-0.26%	0.04%	-0.04%	0.00%
	0.46	-1.17	0.23	-0.54	-0.08
(Assets - threshold) × 1(Assets ≥ $500MM)	2.67%	-3.03%	-2.47%	-0.68%	-1.12%
	0.49	-1.46	-2.01	-0.94	-1.95
(Assets - threshold)^2 × 1(Assets ≥ $500MM)	10.49%	-6.85%	-7.10%	-3.90%	-3.63%
	0.65	-1.29	-2.03	-2.44	-2.28
(Assets - threshold)^3 × 1(Assets ≥ $500MM)	4.15%	-6.31%	-5.17%	-3.64%	-2.89%
	0.29	-1.58	-1.67	-2.65	-1.95
Bank fixed effects?	Yes	Yes	Yes	Yes	Yes
Time fixed effects?	Yes	Yes	Yes	Yes	Yes
Number of banks	6,219	6,219	6,209	6,209	6,209
Number of observations	52,143	52,143	52,070	52,070	52,071

Note: This table displays results of IV regressions based on equations (2) and (3). The "Assets" are measured in time t-2, "Days between examinations" are measured at t-1, and all dependent variables are measured at time t+2. The entire data set 1994-2012 is used. "ROE" is Returns on Equity, "NIM/TL" is Net Interest Margin as a percentage of Total Loans, "NPL/TL" is Non-performing Loans as a percentage of Total Loans, "CO/TL" is Charge-offs as a percentage of Total Loans, and "PLLL/TL" is Provision for Loan and Lease Losses as a percentage of Total Loans. Bank-level clustered T-statistics are shaded in grey.