INCONSISTENT REGULATORS: EVIDENCE FROM BANKING

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Abstract

We find that regulators can implement identical rules inconsistently due to differences in their institutional design and incentives and this behavior adversely impacts the effectiveness with which regulation is implemented. We study supervisory decisions of U.S. banking regulators and exploit a legally determined rotation policy that assigns federal and state supervisors to the same bank at exogenously fixed time intervals. Comparing federal and state regulator supervisory ratings within the same bank, we find that federal regulators are systematically tougher, downgrading supervisory ratings almost twice as frequently as state supervisors. State regulators counteract these downgrades to some degree by upgrading more frequently. Under federal regulators, banks report higher fraction of nonperforming loans, more delinquent loans, higher regulatory capital ratios, and lower returns on assets. Leniency of state regulators relative to their federal counterparts is related to costly consequences and likely proxies for delayed corrective actions—more lenient states have higher bank-failure rates, lower repayment rates of government assistance funds, and more costly bank resolutions. Moreover, relative leniency of state regulators at the bank level predicts the bank's subsequent likelihood of severe distress. The discrepancy in regulator behavior arises because of differences in how much regulators care about the local economy as well as differences in human and financial resources involved in implementing the regulation. There is no support for the corruption hypothesis, which includes "revolving doors" as a reason for leniency of state regulators. We conclude by discussing broader applicability of our findings as well as implications of our work for the design of banking regulators in the U.S. and Europe.

Keywords: Banking Regulation, Banking Supervision, Dual Banking, CAMELS, Financial Institutions.

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1. Introduction

At least since Pigou (1938), economists have been interested in effective regulatory design. A critical element of this design involves assessing how regulatory institutions themselves affect the implementation of regulations. This is a complex question, as it often entails understanding the interactions among several regulatory agencies with overlapping jurisdictions and differing incentives, as well as the degree to which they are consistent in implementing the rules. Several anecdotes suggest that inconsistent oversight by regulators with different incentives could hinder regulatory effectiveness, none clearer than the demise of Washington Mutual Bank (WaMu), a $300 billion thrift and the sixth largest U.S. bank at the time of its failure.[1] According to a formal congressional investigation, WaMu's failure—the largest bank failure in U.S. history—was, to a large extent, due to delayed corrective action that resulted from inconsistent oversight by its regulators, the Office of Thrift Supervision (OTS) and the Federal Deposit Insurance Corporation (FDIC).[2] Despite the relevance of this issue, little systematic evidence exists on whether there is differential implementation of regulation by regulators in banking or other industries. We fill this gap by positing and empirically demonstrating that regulators can implement identical rules inconsistently due to differences in their "will"—i.e. their institutional design and incentives—and that this behavior can adversely impact regulatory effectiveness.

The regulatory structure in U.S. banking provides a convenient laboratory for studying the issue of consistency across regulators as it involves oversight of institutions by two regulators—state and federal regulators—with differing institutional design and incentives. Using a natural experiment to circumvent the issue of banks self-selecting into different regulatory environments, we provide evidence of inconsistent implementation of identical rules by federal and state regulators. Importantly, we show that this inconsistency is associated with costs that potentially hamper the effectiveness of regulation by delaying corrective action. We investigate the reasons for discrepancy in supervisory behavior and find that it arises due to differences in how much regulators care about local constituents as well as differences in human and financial resources involved in implementing the regulation.

Inconsistent implementation of regulation by state and federal regulators relates broadly to the debate on effectiveness of dual regulatory structure that has taken place in several industries, including banking (see Scott 1977; Dixon and Weiser 2006). The fallout from the recent financial crisis has triggered historical reforms in banking regulation (see Brunnermeier et al.

[1] More anecdotes on ineffective regulation due to inconsistent supervision by U.S. state and federal banking regulators are available in Committee on Banking, Housing, and Urban Affairs (1994). There are also abundant examples of regulatory impediments due to inconsistencies between state and federal regulators in other industries (see, for example, Lane 2004 for securities regulation, Dixon and Weiser 2006 for telecommunication regulation, and Esworthy 2008 for regulations on pollution control).

[2] Absent a deal between the FDIC and JPMorgan Chase to take over WaMu's assets, this failure would have exhausted the entire Deposit Insurance Fund. More detail on the tussle between the OTS and FDIC in the run up to WaMu's failure in September 2008 is available in the Office of Inspector General (2010) and the congressional investigation report (Committee on Homeland Security and Governmental Affairs 2011).

2009). However, most of these reforms have targeted activities that should be regulated, while the discussion on reforming the current dual structure of supervision in banking has been less active. This paucity of discussion is not due to the lack of arguments for and against the current regulatory structure.[3] On the one hand, proponents argue that the informational advantage of state supervisors coupled with the broader perspective of federal supervisors enhances the nature of decision making. In addition, it is argued that competing supervisors allow for lower political interference, giving banks the choice of picking the less "tyrannical" regulator and a more efficient allocation in the sense of Tiebout (1956). On the other hand, critics suggest that such a complex supervisory structure may produce regulatory inconsistencies and result in a "race to the bottom" in terms of regulatory laxity (White 2011). It may also create coordination and informational problems between government agencies.

Empirical evidence validating or refuting these claims has been lacking due to two main difficulties. First, it is hard to find comparable metrics of behavior across the myriad of dimensions affected by different regulators overseeing different firms, in particular complex entities such as banks. To overcome this issue, we rely on the easy-to-compare results of safety and soundness on-site examinations by regulators, which are a crucial micro-prudential supervisory tool. These examinations culminate in the assignment of a CAMELS rating, which summarizes the overall condition of the bank on a numerical scale and forms a critical input in how the bank is regulated (see Peek, Rosengren, and Tootell 1999 for a comprehensive discussion on the importance of these ratings). Second, and perhaps more challenging, a bank's regulatory setting is determined endogenously through its charter choice, and thus is driven by observable and unobservable bank characteristics. As a result, it is difficult to infer if a bank picked the supervisor more suited to actions it intends to undertake, or if the regulator itself changed the actions taken by a bank.

Our identification strategy exploits a legally determined rotation policy that assigns federal and state supervisors to the same banks at exogenously predetermined time intervals. This allows us to circumvent the issue of banks sorting into different regulatory settings. The policy on alternating examinations was introduced in the Riegle Act of 1994 and subsequent regulatory provisions with the goal of reducing administrative requirements for insured depository institutions—that is, eliminating the burden of facing both federal and state examination in the same year. The law assigns state chartered commercial banks to fixed 12-month or 18-month rotations between state and federal supervisors. In particular, the rotation involves state regulators and the FDIC for non-member banks (NMBs) and state regulators and the Federal Reserve (Fed) for state member banks of the Federal Reserve System (SMBs). SMB and NMB entities combined cover a substantial portion of the U.S. banking industry, about 80% in terms of

[3] See House Committee on Banking and Currency (1965), Scott (1977), and Butler and Macey (1987).

the number of commercial banks and 38% in terms of total assets on average over the sample period (with a maximum share of 45% of total assets).[4]

The empirical design of this paper is best understood through a simple example. Consider a bank (*B*) that can be supervised either by a state regulator (*S*) or by a federal regulator (*F)*. An ideal experiment assessing differences in supervisory decisions would assign *B* to both *S* and *F* simultaneously and consequently track differences in their rating actions. This thought experiment would circumvent any selection issue since the same bank, *B,* is assigned to both regulators concurrently. However, to identify the mean difference in the rating actions of the two regulators it is sufficient for *S* and *F* to be assigned to *B* independent of *B's* financial condition, even if the assignment is not concurrent. Our empirical set up mimics this closely, since regulators *S* and *F* are alternatively assigned to *B* every *t* periods, with *t* predetermined by our policy instrument. The assignment of regulators is exogenous to the financial conditions of *B* and allows us to use within bank variation to identify average difference in supervisory rating actions. Notably, the time delay between when regulators evaluate *B* should not statistically result in *S* or *F* confronting *B* with different financial health systematically. Our set up allows us to track not only the differences in supervisory ratings but also the consequences of supervisory decisions on bank *B*'s operations.

In our main tests we use unique data to assess the difference in supervisory activities of federal and state regulators. These activities involve examining depository institutions to evaluate safety and soundness conditions. The process culminates in a compliance report for each bank, whose assessment is summarized by a CAMELS rating, an acronym for its six components: capital adequacy, asset quality, management and administration, earnings, liquidity, and sensitivity to market risk. We identify a systematic effect of supervisor identity on these ratings. Federal supervisors are systematically more likely to downgrade CAMELS ratings for the same bank relative to state supervisors. These results are quantitatively large, as federal supervisors appear twice as likely to downgrade relative to state supervisors. State regulators counteract these downgrades to some degree by upgrading more frequently. Given the nature of our empirical design, it is statistically implausible that these patterns occur because the federal regulator is more likely to confront banks precisely when they are not doing well. We also examine which of the subcomponents of the rating are responsible for these effects and find that, while the effects are present for all subcomponents, they are the largest for the component where the potential for regulatory discretion is likely to be highest (management component, M).

[4] In 2011, assets by state-chartered banks reached $3.8 trillion, one-fourth of U.S. GDP that year. The fraction of assets accounted for by state-chartered banks fluctuates over time, as the largest banking organizations, nearly all of which include subsidiaries both with national and state charters, restructure their operations after mergers and regulatory changes (for example, JPMorgan Chase, and its predecessor entity, switched its lead bank from a national to a state charter, and then back again to a national charter during our sample period).

Next, we examine if, on average, banks operations respond to the presence of a federal regulator relative to a state one. We find evidence of significant changes in banking operations following federal supervision. In particular, banks report higher capital ratios, an increase in expense ratios, a drop in their profitability, and a worsening of their asset quality, as measured by the ratio of delinquent and nonperforming loans, in presence of federal regulators. We interpret these results as reflective of the supervisory authority being used by federal regulators in making a bank take corrective actions to address the problems highlighted in the examination.[5] Interestingly, some of these effects on balance sheet variables are also detectible as the federal supervisory cycle approaches. This is reasonable since banks have a strong incentive to maintain good ratings, because their costs—such as insurance premium on deposits—can go up with lower ratings. Of course, given the short time horizon between regulatory spells, we find that such behavior is limited. This evidence suggests that banks engage in some "window-dressing" in anticipation of tougher federal regulators. Notably, to the extent banks do window-dress for tougher federal regulators, there is a bias generated against finding any differences in ratings across the two types of regulators. Thus, our estimates on differences in ratings between federal and state regulators can be considered a lower bound of the true effect.

Our findings can help inform on the efficiency of the existing structure of dual banking regulators. In general, one could argue that supervisors of different type regulating a given bank in rotation might be an efficient and cost-saving arrangement with say a less thorough or skilled regulator conducting a less extensive exam followed by a more detailed exam by a more rigorous regulator, or a "nurse/doctor" arrangement. Alternatively, it is possible that federal and state regulators have an implicit "good cop/bad cop" arrangement that allows for richer information gathering from banks—federal regulators' toughness allows for better information to be gathered by state regulators, which in turn potentially allows for better implementation of regulation.[6] The collage of evidence we uncover suggests that both these interpretations, although intriguing, are unlikely. Rather, inconsistent behavior of regulators seems to adversely impact the effectiveness with which regulation is implemented.

To begin with, we show that, while federal regulators are significantly tougher than state regulators, there is also a counteraction of these downgrades by state regulators who are more likely to upgrade. This seems hard to rationalize as an efficient arrangement involving a more thorough regulator examining the banks infrequently, since in a setting of alternating regulators, the two regulators would not actively counteract each other's decisions. Secondly, we report that

[5] These results are consistent with earlier literature on the informational value of bank examinations in inducing corrective adjustments of a bank's books (Berger and Davies 1998; Gunther and Moore 2003).

[6] It is worth noting that the Riegle Act was predominantly motivated by red tape reduction, and in no part of its text does it appear focused on the creation of an optimal mix of more and less lenient regulators. Our personal discussion of the matter with several supervision and regulation experts also appears to strongly support the view that this is not an aforethought feature of the regulatory structure. In addition, to the best of these practitioners' knowledge, although inconsistent implementation conforms to their priors, no specific gain (e.g. extra information conceded by the bank) is commonly recognized as originating from such out-of-step behavior of the federal and state regulators.

the extent of leniency of state regulators relative to federal regulators accentuates when banks confront adverse local economic conditions. This is also hard to rationalize by an efficient arrangement argument since such a system would likely have the thorough regulator supervising the bank during harsh economic times-- periods when extensive examinations would be needed the most.

We continue our analysis by showing that a softer stance of state regulators relative to their federal counterparts has real consequences. States with more lenient local regulators relative to their federal counterparts have higher bank-failure rates and problem-bank rates, a higher proportion of banks that have been unable to repay Troubled Asset Relief Program (TARP) money during the recent crisis, and a higher discount on assets of troubled banks that are liquidated by the FDIC. Moreover, the federal-state spread is likely a proxy for regulatory delay at the bank level since a higher difference at the bank level makes it more likely that a given bank subsequently fails.[7] We further reinforce these arguments by providing evidence from the changes in regulator behavior around the passage of the Riegle Act. At the introduction of the rotation policy, a bank moves from having simultaneous federal and state oversight every period to having federal and state supervision in alternation. This setting allows us to demonstrate that the alternation arrangement, which potentially reduces red-tape costs, is significantly more lenient in terms of supervision when compared to a regime where a tougher regulator examines the bank at all times.

We extend our analysis by showing that there is substantial regional heterogeneity in the leniency of state regulators relative to their federal counterparts and by examining reasons behind these differences. We find that one main reason why state regulators do not crack down on banks as much as federal regulators is that they care about the local economy. Notably, local unemployment has the largest quantitative effect in explaining state regulator leniency across various alternatives. There is also significant evidence that state regulators are softer in rating banks because they lack financial and human capital to implement the regulation. Finally, we find no support for the corruption hypothesis, which includes "revolving doors" as a reason for leniency of state regulators.

We conclude by discussing implications of our findings for regulatory design of the banking system. Though our results are estimated on state-chartered banks —an important sector both in terms of its economic size as well as its impact on financial stability— we discuss their significance for understanding regulation in the full U.S. banking universe by conducting analysis on all U.S. banks and regulators. We argue that the movement of banks (including large

[7] As we show, inconsistencies between regulators can induce variability in bank operations. Thus, inconsistent implementation may also potentially reduce the transparency of bank balance sheets for agents in the economy who are unaware of the source of this variability, as the exact alternation schedule of regulators for each bank is not known to the public. As shown in Caballero, Hoshi, and Kashyap (2008), lack of timeliness of corrective banking actions as well as opaque balance-sheet information can be costly and can adversely impact real allocations.

ones) between national and state charters makes the behavior of regulators inside each of these systems interdependent. Thus, understanding optimal regulation of large banks in national charters requires clear inference on the nature of the regulatory environment that exists inside state charters, like the one presented in our paper. As a validation of this notion, we show that the choice of banks to enter or relocate in a state is related to the federal-state spread in that state.

More broadly, we discuss the implication of our findings in understanding what might be expected in regimes where a single regulator drives oversight decisions versus a system where multiple regulators share oversight. We show that sharing oversight among regulators may also have costs — similar to what competition among regulators introduces in terms of regulatory laxity — since the stricter regulator faces dilution of control due to the presence of more lenient regulators, and especially so when banks face worse economic conditions. We conclude by discussing the implications of these findings for optimal regulation, including the debate on the redesign of banking regulation in Europe.

Our work is broadly related to several strands of the economics and finance literature. First, it is most directly related to work on regulatory design. The issue of the design of regulation spans from its early public interest roots to the Chicago theory of Stigler (1971) and Peltzman (1976), who argued that regulation is often captured by the industry it is meant to regulate and is designed primarily for insiders' benefit, to the rent-seeking theory of regulation (e.g. Shleifer and Vishny 1999).[8] Most of this work (including in the context of banking) debates the pros and cons of different regulatory structures, but provides surprisingly little systematic empirical evidence. Our work contributes to this literature by showing that regulators can be inconsistent and tracing the reasons and consequences of such behavior. Second, and more relevant to the issue of regulatory inconsistencies, this paper speaks to the literature in industrial organization that focuses on regulatory consistency and regulatory uncertainty (see Brennan and Schwartz 1982a,b, Viscusi 1983, Prager 1989, and Teisberg 1993). Not unlike our paper, this literature also studies some sources of regulatory inconsistencies (e.g. elected versus appointed regulators) as well as their consequences (e.g. differential firm productivity).

Third, this paper is connected to studies on regulatory arbitrage (Rosen 2003, 2005, Rezende 2011) that suggests that banks actively shop for regulators who are likely to be softer on them through different channels such as charter changes, mergers with other banks, supervisory ratings, or changing their location of incorporation. Other work in this area (Kane 2000, Calomiris 2006, and White 2011) also discusses changes in regulatory standards due to competition between regulators. In general, this arbitraging behavior by banks may induce a

[8] For review of the public interest theory see Laffont and Tirole (1993) which also focuses on a modern take on regulation, encompassing the role of asymmetric information. Also related is the work by Dewatripont and Tirole (1994), Boot and Thakor (1993), and Hellman, Murdock, and Stiglitz (2000), among others. The issue of centralized versus decentralized regulation, often discussing state versus federal regulation in the U.S. context, has received attention in Martimort (1999), Laffont and Martimort (1999), and Laffont and Pouyet (2004), among others.

potentially sizeable selection bias in examining the effects of regulatory actions. Our empirical design circumvents this issue and shows how such bias occurs and provides guidelines on causal estimates of the influence of regulators.[9] Finally, our work complements the empirical literature on the effects of banking regulation and supervision. Such work encompasses studies on the role of regulation and supervision in well-established banking and financial sectors of developed economies (Jayaratne and Strahan 1996, Berger and Hannan 1998, Kroszner and Strahan 1999), as well as in developing financial sectors across the globe (see Beck et al. 2000, Barth et al. 2004, among others).

The rest of the paper is organized as follows. In Section 2, we discuss the structure of U.S. banking supervision and the data. In Section 3, we highlight our empirical strategy. Next, in Section 4, we report our main results. In Section 5 we assess the costs and benefits of inconsistent regulation. Section 6 explores the likely sources of differences in regulatory behavior. Section 7 concludes by discussing broader applicability of our findings as well as implications of our work for design of banking regulators in the U.S. and Europe.

2. U.S. Banking Regulation, Alternating Supervision, and Data

2.1 An Overview of U.S. Banking Regulation

The U.S. banking industry has evolved into a complex and fragmented system that reflects America's historical tension between centralizing and decentralizing political forces. Since the National Bank Act of 1863, commercial banks have dealt with a dual regulatory system, under which they are chartered and supervised by both federal and state-level entities.[10] This system has often been praised by policy makers as playing a key role in financial innovation, as federal and state regulating bodies compete with one another and thus trim unnecessary rules (Scott 1977). In addition, commentators have argued that state regulators can leverage their local knowledge to improve their supervisory decisions. At the same time several policy makers and commentators have criticized the dual system for the resulting fragmentation of the banking sector and for the risk of a "competition for laxity" generated among bank regulators (for example, Fed Chairman Arthur Burns, 1974 and discussion in White 2011). This latter issue has been actively debated in the past—most recently around the Gramm-Leach-Bliley Act of 1999—and has again resurfaced in the aftermath of the 2008–09 crisis (see Senator Dodd's speech in Senate Banking Committee hearing in September 2009).

[9] The literature on regulatory shopping and a race to the bottom extends beyond banking. For instance, the literature on international trade provides evidence that firms shop for the least stringent regulator. Similarly, there is a growing literature on shopping of rating agencies by issuers of mortgage-backed securities (e.g. Bolton et al. 2011).

[10] Prior to 1863 state commercial banking was the primary form of banking. Commercial banks remain the predominant form of depository institutions in the U.S. and are the focus of this paper. The other main classes of depository institutions are savings banks (known as thrifts), which generally specialize in real estate lending, and credit unions, which are cooperative financial institutions. Other types of depository institutions in the U.S. are the following: Edge corporations and the branches and agencies of foreign banks.

In the current system banks can choose between a state and national charter. With a state charter, they can also decide whether or not to be members of the Federal Reserve System. The three different types of commercial bank charters correspond to three different primary federal regulators: the Office of the Comptroller of the Currency (OCC), instituted in 1863; the Federal Deposit Insurance Corporation (FDIC), instituted in 1933; and the Federal Reserve System (the Fed), instituted in 1913. Federally chartered banks, also known as national banks (NA), are primarily supervised (and chartered) by the OCC. State banks are supervised by their chartering state banking departments, in conjunction with the Federal Reserve, if they are members of the Federal Reserve System (as we stated before, these banks are called state member banks, SMBs). Otherwise, state banks are supervised by their respective chartering state banking departments along with the FDIC, since these banks are not a member of the Federal Reserve System (these banks are referred to as non-member banks, NMBs). In general, the regulator that is in charge of regulating and supervising an entity is also a function of its line of business. Figure 1 depicts the structure of supervision and regulation for U.S. commercial banks and thrifts.

Until recently, different charters implied notable differences in permissible activities as well as regulatory requirements. For example, through the early 1980s non-member banks were not subject to reserve requirements (according to the Depository Institutions Deregulation and Monetary Control Act of 1980), their lending limits could differ significantly across states, their ability to branch interstate differed, and the list of activities (e.g. providing insurance) that they were permitted was quite diverse. However, over the years, many of the differences across requirements and charters have disappeared as regulatory charters have converged. Many commentators believe that the main drivers of charter choice now are direct regulatory costs and the bank's perception of the regulator's accessibility.[11] Small banks tend to prefer state charters, as applications are streamlined and supervisory fees are lower (Blair and Kushmeider 2006). Larger banks, especially those that aim at branching inter-state, tend to prefer national charters (see, e.g. Bierce 2007).[12]

Banking micro-prudential supervision in the United States relies on two main pillars: off- and on-site monitoring. Off-site monitoring requires all depository institutions to file quarterly "Reports of Condition and Income," or Call Reports. Regulators use Call Reports to monitor a bank's financial conditions between on-site examinations. On-site "safety and soundness" examinations are used to verify the content of Call Reports and to gather additional in-depth information regarding the safety and soundness of the supervised entity as well as its compliance with regulations. In an on-site examination, supervisors read additional documents from the bank, review and evaluate its loan portfolio, and meet with the bank's management. Supervisors

[11] Office of Inspector General (2002). For a cautionary tale concerning the OTS "accessibility," see Cyran (2009) and Office of Inspector General (2010). In our sample for analysis, state banking departments often mention higher "accessibility" among the main advantages of a state charter versus a national one. (See, for example, http://www.banking.state.tx.us/corp/charter/benefits.htm.)

[12] See Rosen (2003) for possible determinants of charter changes.

comment on areas that must be improved, and depending on the bank's condition, they also discuss with management the need for informal or formal supervisory actions. Informal actions are established through a commitment from the bank to solve the deficiencies identified in the form of a memorandum of understanding or a bank board resolution. Formal actions are more severe. They include cease-and-desist orders, suspensions or removals of banks' senior management, and terminations of insurance.

These examinations culminate in the assignment by a team of examiners of a CAMELS rating, which summarizes the conditions of the bank (broken down into six components: capital adequacy, asset quality, management, earnings, liquidity, and sensitivity to market risk). Ratings for each of the six components and the final rating are on a scale of 1 to 5, with the lower numbers indicating fewer/and or lesser regulatory concerns. Banks with a rating of 1 or 2 are considered to present few (if any) significant regulatory concerns, whereas those with 3, 4, and 5 ratings present moderate to extreme levels of regulatory concerns.

Not only are these ratings a central summary measure of banking supervision that is easily comparable, they are also relevant for several important policy decisions. In particular, CAMELS are used to determine how high to set insurance premiums on deposit insurance by the FDIC, whether to lend credit to financial institutions by the Fed (lender of last resort), whether to make licensing, branching, and merger approvals, and whether to allow banks to participate in government programs (like TARP and small business lending programs).

2.2 Alternating U.S. Banking Supervision: Policy and Coverage

Since the Federal Deposit Insurance Corporation Improvement Act of 1991, federal bank supervisors are required to conduct on-site examinations every 12 months, unless their assets fall below a minimum threshold, in which case the exams are conducted every 18 months. This threshold has changed over time and since 2007 stands at $500 million for SMBs and NMBs (FRB 2008 and FDIC 2002).[13] Federal supervisors began coordinating with state banking departments so that they could share examination results in the 1980s. Section 349 of the Riegle Community Development and Regulatory Improvement Act of 1994 required the Federal Financial Institutions Examination Council (FFIEC) to issue guidelines for determining the acceptability of state examination reports as substitutes for federal examinations.

The aim of these rules was to reduce the regulatory burden on state-chartered banks under a dual supervision system, substituting a federal examination with a state examination. The rules were issued in the Federal Financial Institutions Examination Council (1995), and the Federal Reserve Board and the FDIC made a formal nationwide state/federal supervisory agreement with the Conference of State Bank Supervisors (CSBS), a national organization of participating state bank

[13] See the U.S. Code Title 12, §1820 (d. 3) for an explicit codification.

regulators.[14] Since the issuance of the Federal Financial Institutions Examination Council (1995), acceptable state reports became eligible substitutes for federal reports; that is, after the FFIEC rules were issued, federal and state regulators could take turns every 12 months (or 18 months for smaller banks) examining state-chartered banks.

As noted previously, the FFIEC rules established that each federal regulator independently determines whether to accept the state examination results based on the type of reports produced by the state examiners, as well as measures of minimum state banking department budgets and the state banking department's accreditation by the CSBS. The FDIC/Fed cooperative agreements cover the vast majority of states. By 1995, both federal agencies separately had already entered into informal and formal arrangements, or working agreements, with most state banking departments, determining the types of banks that would be examined on an alternating independent basis or on a joint examination basis, among other matters.[15] While our results are quite insensitive to the choice of the starting period after the FFIEC guidelines of 1995 were issued, we do lack a precise date on which the policy starts operating. We conservatively allow for a one-year breaking-in period and begin our analysis as of 1996:Q1 to ensure that idiosyncrasies in initial program implementation disappear. By 1996:Q1, rotations of supervisors across the vast majority of states are pervasive in the data. Our sample ends in 2010:Q4.

Alternating examinations are not available for a small subsample of banks. Only banks that at the most recent examination were assessed to have a composite CAMELS rating of either 1 or 2 are part of the alternating program. Because of this constraint, in our sample upgrades are from a rating of 2 to 1 and downgrades may occur from a rating of 1 to 2 or above (3, 4, or 5) or from a rating of 2 to 3 or above (4 or 5) ratings. Further, only SMBs with an asset size of less than $10 billion are part of the program. In our sample of analysis, we focus on SMBs satisfying these criteria, since only for such banks the supervisory rotation policy is predetermined. The FDIC conducts alternating independent exams only for NMBs with an asset size of less than $250 million, representing more than 80% of all NMBs. Bank examinations of larger NMBs are run on a joint basis with the state examiner—in such cases, a mix of state and FDIC examiners participates in the on-site visits. However, even in the case of joint NMB examinations, only one agency is the "lead agency" in assigning the CAMELS. We include such joint examinations in our sample, but our results are unaffected when excluding NMBs above $250 million.

We further filter the sample by excluding targeted examinations as well as exams where all subcomponents of the CAMELS rating are not scored or available. We also exclude concurrent

[14] These rules are summarized in Federal Deposit Insurance Corporation (2002) and Board of Governors of the Federal Reserve System (2008)—two manuals for commercial bank examinations.

[15] According to the Federal Deposit Insurance Corporation (2004), all state banking departments with the exception of seven had signed formal cooperative agreements by 2004, with the number falling to four by 2007. In 2004, the state banking departments without formal agreements with federal regulators were in Alaska, Montana, Nevada, New Hampshire, Rhode Island, South Dakota, and South Carolina. See: http://www.csbs.org/development/accreditation/Pages/default.aspx. See also Rezende (2010) for a discussion.

examinations because of their exceptional nature relative to the routine safety and soundness examinations that are our focus. Even when meeting all the preceding criteria for inclusion in our alternating supervision sample, we observe a small fraction (about 10%) of banks that do not display any rotation during our sample period. These banks with no signs of supervision rotation do not show up systematically within the sample—and they are spread out across states and over time. These banks appear to be mostly certain types of depository institutions with peculiar purposes (e.g. Industrial Loan Companies, ILCs) or de novo banks. Because these banks do not satisfy our condition for identification that requires exogenous rotation of regulators, we exclude them from our sample. We note, however, that our results are unaffected by including these specific banks in our analysis.

2.3 Data and Descriptive Statistics on Rotation

We use a unique dataset from the National Information Center of the Federal Reserve System, covering the time period from 1996 through 2010, of all on-site examination of safety and soundness conducted by banking regulators. The data contain detailed information about financial information of depository institutions, regulated and select non-regulated institutions, as well as other institutions that have a regulatory or reporting relationship with the Federal Reserve System. The key data for the purposes of this study are unique bank identifiers, the examiner identity (e.g. the FDIC, the Fed, the states, the OCC, and the OTS), the exam date, and most importantly the composite CAMELS rating and its components. In contrast to several papers that have explored the determinants of supervisory ratings at the bank-holding level (e.g. Berger, Davies, and Flannery 1998), we employ the ratings at the level of the commercial bank, which is the entity level at which we observe the examiner rotations.

We merge this information with balance-sheet measures of bank profitability, profitability, and asset quality from Call Reports. Our main Call Reports variables are: Tier1 risk-based capital ratio, leverage ratio (Tier1 capital as a share of total risk-unweighted assets), efficiency ratio (Noninterest expense as percent of net operating revenue), return on assets, share of nonperforming loans to total loans, and the delinquency rate of the loan portfolio. Delinquent loans include loans that are 30-plus days past due and loans in nonaccrual status, and nonperforming loans are 90-plus days delinquent and loans in nonaccrual status. In some of our analysis we also dissect delinquency and nonperforming loans for various asset classes in a bank's portfolio (e.g. commercial real estate, residential real estate, and commercial and industrial loans).

Importantly for our analysis, we define a supervisory spell as the quarters between when a regulator conducts its on-site examination and when the alternate regulator examines the bank. As discussed in Section 2.2, these spells are mandated to be either four or six quarters, depending on the bank's asset size. In our regressions, we use this definition of supervisory spell to assess the relationship between changes in supervisor identity and changes in CAMELS ratings and

bank operations. Since CAMELS rating rarely changes between on-site exams, we effectively compare the value of these ratings during a federal regulator spell to its value during a state regulator spell. In contrast, bank variables can potentially change every quarter. Thus, we compare the average value of a variable across quarters during a federal regulator spell to its average across quarters during a state regulator spell. This discussion is illustrated in Figure 2.

Summary statistics for our sample of rotating banks as of 1996:Q1 appear in Table 1. We present the descriptive statistics on CAMELS ratings, as well as bank balance-sheet measures such as delinquencies, nonperforming loans, and ROA for both SMBs and NMBs split up by whether they were assigned to federal or state regulators at the start of our sample. These statistics provide sample moments that will be useful for interpreting the magnitude of our regression coefficients.

Figure 3 reports the frequency of the rotation spells graphically, illustrating compliance to the rotation profiles required by law for SMBs and NMBs. The vast majority of banks display supervisory rotations between four and eight quarters matching well the rotation restrictions discussed earlier. In particular, NMBs are subject to less frequent examinations and rotations, about one every 6 quarters, since NMBs tend to be smaller banks (the mean assets size of NMBs in our sample in 1996:Q1 is $95 million). Being larger, SMBs are subject to 4-quarter rotations in most cases (the mean assets size of SMBs in our sample in 1996:Q1 is $160 million).

We investigate the reasons for dispersion around the regulatory spells of four and six quarters that are implied by Riegle Act. The shorter rotation spells are mostly accounted for by institutions that exit our sample because of the large wave of bank mergers that occurred over the past 15 years. The relaxation of intrastate and interstate branching regulation and the Gramm-Leach-Bliley Act of 1999 were primary facilitators of this wave of mergers and acquisitions, a trend that we find is unrelated to the identity of the supervisor (federal or state) in charge of the exams.[16] Regulation spells may also be shorter because of banks switching charters or relocating their operations (Rosen 2005). These instances are fairly limited in the data, and similar to M&A activity, we find relocations and charter switches to be unrelated to the identity of the supervisor in charge of the exams. We note that exclusion of shorter spells from our analysis does not impact the results we present later. We also occasionally find idiosyncratic cases of longer rotation cycles, and their exclusion also does not affect our results in any way. Discussions with supervisors suggested that many of these idiosyncrasies might be due to staffing issues, both at the state and federal levels.[17] Often a longer-than-expected rotation time with one regulator is offset by a subsequent shorter rotation time with the alternating regulator; this tendency to rebalance the time between rotations is in line with regulatory restriction on spells.

[16] Prior research has found this trend due to weakening of small bank special interests vis-à-vis large banks in light of the introduction of new technologies in lending and deposit-taking (see Kroszner and Strahan 1999).

[17] Examples include instances when the examiner assigned to a specific bank was on leave/vacation at the predetermined exam time and when the assigned examiner was still involved with exams at another institution.

Finally, Table 1 also allows us to investigate the nature of assignment of banks to state versus federal regulators at the inception of the rotation policy. It reports *t*-tests for differences in means across federally and state-regulated banks involved in the rotation process as of the first quarter of 1996. Broadly, we find that banks assigned to state regulators versus federal look similar in the cross-section at inception. We fail to reject equality of means in the vast majority of the controlling variables. Occasionally, Table 1 reports some differences along certain dimensions, indicating potential deviations from pure random assignment. These cross-sectional differences are, however, quantitatively small. As we elaborate in the next section, our identification strategy relies on predetermined *within-bank* variation of regulators and not on which regulator was assigned at the inception of the rotation policy. Nevertheless, the quasi-randomized nature of assignment of initial supervisors across banks lends further support to our empirical design.

3. Identification Strategy

3.1 Empirical Model

We now present our empirical model and describe our identification strategy. Consider a regulatory outcome variable of interest Y_{it} (e.g. the composite CAMELS rating) to be linearly determined by a vector of characteristics of bank *i* at quarter *t*, B_{it}, and by the characteristics of the supervisor S_{it} at quarter *t* according to:

$$Y_{it} = \alpha + \beta B_{it} + \sigma S_{it} + \theta_i + \lambda_t + \epsilon_{it} \ ,$$

including bank-specific fixed effects θ_i and quarter fixed effects λ_t. Let us consider within-bank/within-quarter deviations from averages to partial out all fixed effects. Representing the within deviations with lower-case variables and dropping bank-quarter subscripts, it follows:

$$y = \beta b + \sigma s + \epsilon, \qquad (1)$$

where ϵ plays the role of classical measurement error deviations. The vector *s* may include regulator-specific characteristics, such as the competence of its team of examiners, the structure of its budget, the role of assessment fees, and the degree of political pressure on the regulator (we examine these dimensions in the following sections). However, for simplicity's sake, let us assume that *s* is scalar, indicating the change in the identity of the regulator. Vector *b* may include variables endogenously set by the bank, such as changes in the bank's ROA, capital ratios, or shifts in the management's composition.

To illustrate the bias due to self-selection by banks, let us assume that the decision of choosing supervisor *s* by bank with characteristics *b* is linear:

$$s = \gamma y + \delta b + u \ , \qquad (2)$$

where *u* represents the idiosyncratic variation in the selection of a regulator. Equation (2) approximates how banks change their regulatory environment *s* depending on their

characteristics b and the regulatory treatment they will receive y (Rosen 2005), which we assume for starkness that banks can exactly predict.[18] The nature of the problem is similar to matching bias in empirical contract theory, as, for instance, studied by Ackerberg and Botticini (2002).[19] By regressing y on b and s, both coefficients would be biased and inconsistently estimated due to $cov(s, \epsilon) \neq 0$.

Our identification is based on the availability of a policy p guaranteeing that, within a set of SMBs and NMBs with rotating regulators, equation (2) does not hold. Instead, the assignment of a new regulator is predetermined by the policy rule:

$$s = p + \eta\,, \tag{3}$$

where the following orthogonality condition holds:

$$E(\epsilon|s) = 0 \; for \; i \in SMB \; or \; i \in NMB. \tag{4}$$

The error term η accounts for idiosyncratic shocks that may introduce variation in the implementation of the rotation policy, as discussed in the case of Figure 3. These include random events, such as conflicting meeting schedules or other factors that lead to temporary unavailability of examiners. Our sample conditioning in (4) requires that we examine only depository institutions for which the regulator's identity is predetermined. Conditional on the bank being a SMB or NMB, under (3) and (4), fixed-effects panel estimation of the parameter vector of interest $[\beta, \sigma]$ in (1) is unbiased and consistently estimated.

In principle, under (3) and (4), it is also possible to identify the effect of supervisor s on bank behavior b itself:

$$b = \xi s + v, \tag{5}$$

where v represents idiosyncratic error deviations in bank behavior. ξ can be consistently estimated, since (3) breaks the simultaneity of b and s implied by (2). Section 4.2 discusses in detail the effect of s on the bank's response outcomes.

3.2 Interpretation

We now discuss two important issues that relate to interpretation of estimates obtained using our identification strategy. First, recall that we exploit only within-bank information and rely on the predetermined nature of the assignment rule p to obtain consistent estimates of the effect of changing a regulator. However, this effect includes both the *direct* effect of a supervisor on

[18] An example of equation (2) would be the choice by Countrywide Financial Corp. to become a thrift in 2007. As discussed in the Financial Crisis Inquiry Commission Report (2011, p. 174), Countrywide moved under OTS oversight because of the increased scrutiny on property appraisals under OCC and of adverse views on Option ARMs voiced by the Fed (both OCC and Fed were Countrywide's previous regulators).

[19] A main difference in our paper is our focus on selection issues arising both in changes and in levels, as opposed to selection arising in levels only. This excludes the possibility of using panel variation as a source of identification in our setting, while it is occasionally employed in matching models. See Ackerberg and Botticini (2002).

CAMELS rating (σ) and any *indirect* effect that the supervisor has on CAMELS rating by altering bank behavior. To see this clearly, replace (5) in (1). The reduced-form regression we estimate is equivalent to:

$$y = (\beta\xi + \sigma)s + \beta v + \epsilon = \sigma' s + \epsilon'. \qquad (6)$$

Here, the total effect of changing a regulator is σ', and it is consistently estimated in our setting. The advantage of estimating equation (6) rather than (1) is that we capture in a single estimate all the channels through which s matters for CAMELS rating: the direct effect σ and the indirect effect $\beta\xi$. More importantly, relative to estimating equation (1), estimating equation (6) does not suffer from potential misspecification due to the omission of relevant elements of the vector b.

We could, however, get some guidance on what this indirect effect in our context is likely to be. In particular, suppose we believe that—for whatever reason—regulators are different in how they rate the same bank, with one regulator being systematically tougher than another. As explained earlier, banks have a strong incentive to maintain good ratings as their costs, such as insurance premium on deposits, can go substantially up with worse ratings. Thus, to the extent banks have some flexibility, they may change some elements of b in anticipation of the tougher regulator—i.e., do window-dressing—to get a reasonable rating. Under this scenario, the indirect effect would create a bias against finding any differences in supervisory ratings across the two regulators. Of course, as explained in Figure 2, besides changing b in anticipation of the tougher regulator's supervisory spell, a bank can also change b during the rotation spell. Consequently, pinning down the precise nature of indirect effect is difficult. Regardless, in our empirical tests we will present results both with and without conditioning on a plethora of bank variables to evaluate the robustness of our findings.

The second issue we want to discuss is that the regressions using our identification strategy could potentially suffer from the omission of dynamic interactions between regulators, such as expectations of federal regulators about subsequent behavior of state regulators. For instance, federal regulators could decide to preemptively downgrade the rating in expectation of a more lenient future spell under state regulators, even if existing conditions may not warrant it. Under this scenario, the structural parameter vector of interest [β, σ] would be consistently recoverable from the data only if information on the nature of the dynamic interaction across regulators was available. Nonetheless, absent such information, the estimated coefficients on b and s still represent consistent reduced-form equilibrium effects of bank behavior and the supervisor's identity. We limit ourselves to such an interpretation here.

4. Empirical Results on Supervisory Ratings and Bank Variables

4.1 Differences in Supervisory Ratings

In this section, we exploit the predetermined assignment of regulators to SMBs and NMBs to assess the effect of a supervisor's identity on the rating obtained by a depository institution. We

start by investigating the nature of the differences in CAMELS ratings that state and federal regulators assign by estimating equation (6). As discussed in Figure 2, supervisory ratings can change only when the exam is conducted and remain fixed across quarters in a supervisory spell. Consequently, the regressions involving these ratings will only use one observation from each supervisory spell.

Table 2 reports the results for our sample of SMB and NMB institutions, supervised alternately by Fed and state regulators. We present results for both the composite CAMELS rating (Table 2A) and for each of its six subcomponents (Table 2B). This allows us to detect possible deviations across the various dimensions scored, since state supervisors might emphasize different safety and soundness components relative to their federal counterparts. All our standard errors are clustered at the state level in order to correct for both between-bank-within-state and within-bank serial correlation in the error term.

Table 2 presents the results for composite CAMELS ratings and its subcomponents in a fixed-effects regression. It shows that a dummy variable for the presence of a federal regulator as the lead agency supervising the bank is positive and statistically significant. These results are consistent across SMBs and NMBs (Table 2A, columns (1) through (4)), and across CAMELS rating components, (Table 2B, columns (1) through (6)). Together they show that federal regulators systematically assign higher CAMELS ratings to a bank. Moreover, while this pattern is the same across all subcomponents, the difference is the largest for the component where the potential for regulatory discretion is likely to be highest (management component, M). Recall that higher CAMELS scores indicate *worse* assessments of the bank, implying that federal regulators are unambiguously tougher than state regulators across all safety and soundness components.

To gauge the economic magnitudes of our findings in the panel regressions presented in Table 2, we need to account for the high persistence of the CAMELS ratings. CAMELS ratings do not vary frequently for a bank, and rating changes likely incorporate substantial information. One sensible approach is to compare our within-bank coefficient estimates around the rotation with the within-bank standard deviation of the CAMELS rating (or its components) provided in the tables. As can be observed from columns (1) and (2) in Table 2A, the effects are very large. In particular, the effect of a switch from a state regulator to the Fed or to the FDIC is about a third of the within-bank standard deviation. To streamline the presentation of the results we pool federal regulators together in subsequent analysis. The magnitudes when combining the federal regulators together are similar—column (3) shows that the effect of a switch from a state regulator to a federal regulator is about a third of the within-bank standard deviation.

It is worth emphasizing that our results remain largely unchanged even after we condition on bank balance sheet variables like ROA, Assets and Tier 1 capital ratio (in column 4). This

provides validation for our identification design where we asserted that the assignment of regulators is governed by a predetermined policy instrument, independent of the banks' financial condition. Our results are also robust to a number of other tests, such as sub-sampling and removing outliers, and are unreported for brevity.

There is another, more intuitive, way of displaying the magnitudes of the results in Table 2 in the form of raw frequencies of changes in CAMELS ratings around the rotation. In other words, conditional on observing a change in the CAMELS rating—equal to one notch in magnitude in our data—we can ask which agency is more likely to downgrade (i.e., report a CAMELS increase) or upgrade (i.e., report a CAMELS drop). The results of this simple tabulation exercise are reported in Table 3 for both SMBs and NMBs as well as for all banks together. The difference between state and federal regulators is striking. Both Fed and FDIC are about twice as likely than their state counterparts to downgrade a commercial bank. For SMBs, 73% of the downgrades originate from the Fed and only 27% from the state regulator. For NMBs, 60% percent of the downgrades originate from the FDIC and only 40% from the state regulator. When considering all the banks in our sample together, we find that 62% of the downgrades originate from the federal regulator and only 38% from the state regulator. These patterns are accentuated when we restrict attention to harsher downgrades (i.e., include banks whose CAMELS ratings increase to 3, 4 or 5) since we now find that 69% of downgrades are originated by federal regulators.

Notably, the Fed and the FDIC are also less likely to upgrade relative to the average state regulator (only 35% of SMB upgrades are Fed-originated and only 46% of NMB upgrades are FDIC-originated). When considering all the banks in our sample together, we find that only 45% of the upgrades originate from the federal regulator. Thus, the federal regulators are systematically and unambiguously more stringent than their state counterparts. In addition, state regulators appear to counteract some of the federal regulator stringency by upgrading more frequently.

We showed in Table 2 that CAMELS ratings are higher (worse) in federal spells relative to state ones. Moreover, in Table 3 we found that federal regulators are systematically more likely to downgrade, while state regulators have a higher tendency to upgrade. We put all these results together in Figure 4. Specifically, we compute the within-bank cumulative change in the rating following the most recent examination as well as future exams in the bank's life cycle. We do this exercise for each bank and exam in our sample. The figure displays the average within-bank rating evolution when conditioning the first rotation to be a federal spell (red line) or without any conditioning (green line). The gray vertical bars indicate regulatory spells involving federal-led exams.

As shown by the green line, the average rating increases by about a quarter of a point from the first to the eighth rotation in a bank life cycle (or about 8 to 12 years, depending on the size of the bank). As shown by the red line, downgrades occur in federal spells on average, while upgrades occur in state spells. Because of the alternation between federal and state regulators, and given the systematic difference in how these regulators rate the banks, implies that the cumulative rating evolves over time in a saw-tooth pattern. Of course, this is only an average effect and not necessarily patterns that are realized in every bank. Indeed, from Table 3, the standard deviation of a rating's change is about one, which implies that following the first exam, federal regulators are about 7% more likely to downgrade a bank, while state regulators are about 5% more likely to upgrade in the following exam.[20]

4.2 Do Supervisors Affect Bank Behavior?

In this section we examine if, on average, banks operations respond to the presence of a federal regulator relative to a state one. One may reasonably conjecture that, in addition to imposing stricter ratings, federal regulators may impose more stringent capital allocations—that is, higher capital imposition (such as higher Tier1 RBCR)—and better governance—that is, explicit booking of past delinquent and nonperforming loans, all at the expense of returns (i.e., resulting in lower ROA and higher expense ratio).[21] We employ information from Call Reports to formally test this proposition along three main dimensions of bank operations: regulatory capital, profitability, and asset quality.

Our specification mirrors equation (6), with the dependent variables being bank balance sheet variables rather than CAMELS ratings. As shown in Figure 2, we define a supervisory spell as the quarters between when a regulator conducts its on-site examination and when the alternate regulator examines the bank. Once the regulator in charge gives the CAMELS rating, it remains fixed across quarters in a supervisor spell. In contrast, bank variables can potentially change every quarter. Thus, our specification now identifies the average value of a variable across quarters during a federal regulator spell to its average across quarters during a state regulator spell.

Table 4 reports empirical evidence that bank behavior is affected in ways consistent with the earlier conjecture. The rotation from a state regulator to a federal regulator unambiguously produces an increase in Tier1 RBCR and the regulatory leverage ratio (defined as Tier1 capital

[20] To see this, note that we present cumulated CAMELS change from date 0. This change in at 0.07 at t =1 (first Fed) and 0.02 at t=2 (first State). Under the assumption that when a change occurs it is one notch, which is what Table 3 tells us, the change in cumulated mean equals the difference in probability of downgrades minus the upgrades in every spell (recall, higher CAMELS implies downgrades). Thus, on average the Fed is more likely to downgrade a bank with about 7% probability after its first exam. Because the cumulative CAMELS are about 0.02 at during the subsequent state spell, it implies that, on average, CAMELS went down about 0.05 during the state spell. Thus, state regulator must have upgraded on net about 5% of the times.

[21] There is a large literature that documents bank discretion in booking losses on its loan portfolio and the factors that influence such behavior. For instance, see Caballero, Hoshi, and Kashyap (2008) for Japanese banks and Kane (1989) and Kroszner and Strahan (1996) for U.S. banks.

divided by total risk-unweighted assets). In addition, we find that relative to state spells, federal regulatory spells see a drop in ROA and an increase in delinquent and nonperforming loans booked by the depository institution. Consistent with the lower ROA, we also find the expense ratio, measured as non interest expense over net operating revenues, to be higher in federal regulator spells. This suggests that during federal regulator spells banks may be more likely to undertake costly adjustments such as increasing their loan loss provisioning. These results are consistent with federal regulators enforcing formal or informal corrective actions for problems that emerge during their examinations. Interestingly, we find no change in loan growth which suggests that vis-à-vis state regulators, more-stringent federal regulators do not appear to limit credit supply. The economic magnitudes of the estimates that are statistically significant range between 3% and 5% of a within-bank standard deviation per extra quarter of federal regulator oversight.[22] These magnitudes appear reasonable, especially given the short time interval available to banks between rotation spells.

It is, of course, also possible that the effects we find are biased estimates of the true effect of federal regulators on bank behavior. The reason is the nearly deterministic nature of the rotation rule, which may allow banks to preemptively respond by "window-dressing" for federal regulators. To formally see how expectation of future rotation may influence the estimates in Table 4, consider a simple example. Here, only the identity of the current regulator and the identity of the regulator in the following examination cycle matter for how bank variable might change. In particular, let us alter equation (5) to:

$$b = \xi s + \chi s' + v \,, \qquad (5')$$

where the prime represents the next supervisory spell when the new regulator takes over. This clearly imposes a dynamic structure not captured earlier. Making use of the condition $s' = 1 - s$, the behavioral response by the bank becomes:

$$b = (\xi - \chi)s + \chi + v \,.$$

Thus, regressing observed bank behavioral variables b on the current regulator's identity s could produce biased estimates of the structural parameter of interest ξ. In the context of our analysis, this argument would imply that anticipation of future supervisory spell of a tougher regulator may generate a response from the bank during the current supervisory spell of the lenient regulator. This could produce downward-biased estimates of the true effect of federal regulators on bank behavior in Table 4. Of course, this is only one side of the story. While the presence of a

[22] We further analyze the nature of a bank's asset portfolio and components of ROA that are affected by the stricter governance imposed by federal regulators. In particular, we analyzed the nature of delinquencies and nonperforming loans when we break the loan portfolios of banks into real estate loans—commercial and residential—and commercial and industrial loans (C&I). We find that the change in delinquency and nonperforming loans documented in Table 4 is driven mainly by a change in real estate loans (both commercial and residential), while there is only limited variation in C&I loan quality around rotations. In addition, we also examine the components of ROA that contribute to its change in Table 4. We find that increases in the provision for loan loss and non-interest expenses (with salaries being the largest component) largely contribute to this change.

tougher regulator may incentivize banks to potentially do window dressing, it may also be hard to do so, given the time span between regulatory spells is short. Thus, the real extent to which such window dressing may occur is an empirical question.

In terms of empirical analysis there are two broad ways to proceed. One alternative is to rely on strong structural assumptions of the type (5') and consistently estimate the structural parameters (ξ and χ in this case), assuming that the model is correct. It is difficult, however, to find explicit guidance on the exact nature of the dynamic response of a bank to future supervision, making results from this exercise model-dependent. An alternative approach, and the one we follow, is to limit the interpretation of the estimated coefficient on *s* in equation (5) to the reduced-form equilibrium effect of the underlying dynamic model and to recognize that we are focusing on a reduced-form effect, such as ξ-χ, and not on ξ directly.

Having said that, one can explore the dynamics of potential window dressing around regulator rotations.[23] We find some evidence that is consistent with banks changing their balance sheet variables in anticipation of a federal regulator. In particular, expense ratio, ROA and non-performing loans start adjusting in the two quarters before federal regulators arrive for the exams. There is limited evidence for such behavior on the capital variables. For brevity, we only discuss these findings without reporting them but note that the nature of these results is qualitatively similar to those reported in Table 8 of the earlier working version of this paper. As was discussed before, to the extent that we find some evidence for window-dressing by banks in anticipation of tougher federal regulators, there is a bias generated against finding any differences in ratings across the two types of regulators. Thus, our estimates on differences in ratings between federal and state regulators can be considered a lower bound of the true effect without such window dressing.

5. Assessing Costs and Benefits of Inconsistent Regulation

We have so far shown that the two types of regulators rate the same bank differently. It is not the case that one regulator is tougher sometimes and the other regulator is tougher at other times. Rather, the difference in how they assess a bank and provide their ratings is systematic. Given the nature of our empirical design, it is statistically implausible that these patterns occur because the federal regulator is more likely to confront banks precisely when they are not doing well. However, based on our evidence so far, it is difficult to assess whether federal regulators are being too tough, thereby imposing some additional costs on the banks, or whether state regulators are being too lenient, thus delaying implementation of corrective regulatory actions. In this section we attempt to address this issue. We also discuss whether more lenient behavior

[23] We re-estimated specification (6) that includes, as before, a dummy indicator equal to 1 if the lead agency in the (current) quarter *t* is federal and 0 otherwise. It also includes two additional indicator variables: one that takes a value of 1 if a federal supervisor replaces the current state supervisor at quarter *t+1* (and 0 otherwise) and another that takes a value of 1 if a federal supervisor replaces the current state supervisor at *t+2* (and 0 otherwise). The coefficients on these additional dummies help capture anticipatory actions on the part of the bank.

displayed by state regulators—their lower willingness to initiate downgrades and higher willingness to initiate upgrades—can be interpreted as a desirable feature.

5.1 Does State Regulator Leniency Have Consequences?

In this section we explore the correlation between the strictness of federal regulators relative to their state counterparts—henceforth, the "federal-state spread"—and various outcome variables at the state level measuring either costs or benefits of regulatory strictness such as bank failures and bank lending volume. We start by illustrating that there are significant regional differences in the federal-state spreads, and therefore a lot to learn by exploiting this variation.

To this end, we extend specification (6) and instead of a single federal-state dummy S_{it}, which compares federal regulators with the average state regulator, we estimate fifty different federal-state contrasts. Figure 5 reports the coefficients on the state dummy variables interactions for the federal regulators with their 5% confidence intervals. In this figure we plot a dashed line that illustrates the average state behavior under a specification analogous to column (3) of Table 2A. It shows that the estimated effects are overwhelmingly above zero for a majority of states—that is, the federal regulators systematically assign higher CAMELS than specific states' regulators. However, there is substantial heterogeneity in laxity of state regulators relative to federal regulators across states—certain states appear less lenient than others—and it is this heterogeneity we want to understand in our subsequent analysis.[24]

In Table 5, we study the possible costs and benefits of inconsistent regulation by assessing the relation between the federal-state spread and bank failures in a given state. Previous research suggests that such failures hamper the proper functioning of the financial system and can stall real economic activity (Calomiris and Gorton 1991).[25] It is not immediately obvious whether the relative leniency of a state regulator would manifest itself in a higher bank failure rate in that state. On the one hand, even if state regulators are lenient, corrective actions by federal regulators could improve the health of a bank and reduce its chances of failure. On the other hand, it might be the case that state regulatory laxity slows down corrective actions by the federal regulators, thereby increasing the chances of a bank failing in that state.

Table 5A presents the results using the baseline specification of Table 2A with composite CAMELS rating as the dependent variable. In column (1), we augment that specification by

[24] Note that this analysis allows us to exclude the possibility that our results in Table 2 may have be driven by a specific subset of states. We also examined the heterogeneity within federal regulators by following an analogous procedure. Both Fed and FDIC prudential supervision activities are in fact organized by geographical divisions—specifically, by twelve regional Federal Reserve Districts and eight FDIC Regions. The specification in this case compared each federal regulator in its different regional districts against the "average" state regulator in that regional jurisdiction. No particular regional district appears to be driving our results (unreported for brevity).

[25] While bank failures are an important element in banking supervision and are frequently discussed in the context of banking crises, policy makers also want to ensure that harsh reserve requirements--which would reduce the frequency of such crises--do not end up hampering allocation of credit in the economy.

including the interaction of a dummy that indicates federal regulator presence with *Failure Rate*, a variable that measures the bank failure rate in the same state as the bank under consideration. We compute the state-level bank failure rates over our sample period. As can be observed, the level term is significant, as before, suggesting that federal regulators are stricter than state regulators. Importantly, we also find that the federal-state spread is larger in states with high bank-failure rates. In other words, states where bank-failure rates are high are also those where state regulators appear less willing to apply strict ratings relative to their federal counterparts. The economic magnitudes suggested by the coefficients are large—a one-standard-deviation movement in the bank failures in a given state is associated with about a 40% increase in the federal-state spread in ratings.

In the next column, we repeat this exercise, replacing bank failure rates with the problem-bank rates. Problem banks capture a wider set of banks, considered by regulators to be in severe financial distress. Problem bank status is also highly predictive of subsequent failure or other restructuring under distress.[26] Because actual bank failures are rare, policy makers and regulators frequently rely on problem bank rates to gauge the condition of the banking system in a region. In column (2), we re-estimate the regression, including the interaction of a dummy that indicates federal regulator presence with *Problem Bank Rate*, a variable that measures the problem-bank failure rate in the same state as the bank under consideration. The results are qualitatively similar to those in the first column and show that a one-standard-deviation movement in the bank failures in a given state is associated with about a 65% increase in the federal-state spread in ratings.

Next, we conduct this exercise using another measure that might capture costs of regulatory ineffectiveness. We construct a measure called TARP repayment that is the percentage of TARP bailout funds that commercial banks in a given state had returned as of September 2012. The notion behind this variable is that difficulty in repaying out TARP funds—which were injected into the financial system to boost the banking sectors' capitalization levels —may be indicative of the weakness of banks in a given state. Note that in contrast to the variables in the first two columns, this variable contains some information outside our sample period. Column (3) presents results of the baseline CAMELS regression including the interaction of a dummy that indicates federal regulator presence with *TARP Repayment,* which measures the TARP funds that were repaid back across all banks in the same state as the bank under consideration. The federal-state spread is larger in states with a low TARP repayment rate. In other words, state regulators appear less willing to apply strict ratings relative to their federal counterparts in states where banks subsequently faced more difficulty in repaying TARP funds.

[26] Problem banks are identified using the criterion employed by regulators—that is, banks that have composite CAMELS ratings of 4 and 5, as defined in the FDIC problem bank list.

Finally, in column (4) we construct another measure to capture the potential costs of delayed regulatory actions. The measure, called *Asset Sale Discount*, represents the discount on sale of assets such as loans when FDIC liquidates or restructures troubled deposit-taking financial institutions. A larger discount potentially captures delayed intervention by regulators, which could result in reduced value of sold assets on account of fire sales.[27] We calculate the discount in a given state based on the difference between book value of all the assets sold in that state relative to the sale value of the same assets across the sample period. Column (4) presents estimates of the baseline CAMELS regression, including the interaction of a dummy that indicates federal regulator presence with the Asset Sale Discount in the same state as the bank under consideration. As is evident, the federal-state spread is larger in states with a high discount on asset sales. In other words, states where bank assets were sold at high discounts relative to their book value were also ones where state regulators appeared less willing to apply strict ratings relative to their federal counterparts. In column (5), we present a multivariate version where we include all the interaction terms together. The qualitative inferences presented earlier remain unchanged.

Concerning the costs of regulator stringency, it is worth reiterating that we have already assessed, in a setting similar to Table 5A, if excessive regulatory stringency on the part of federal regulators is associated with reduction in the credit supply in the economy. As was shown in column (7) of Table 4, there is no relationship between supervisor identity and a bank's growth of new loans. Thus, excessive regulatory stringency by federal regulators is not associated with reduction in the credit supply in the economy, at least in the short run.

So far we have assessed the relationship between the federal-state spread and various outcome variables contemporaneously. We now sharpen our analysis by exploring whether the relationship between the federal-state spread in a given bank and its subsequent performance holds in a predictive sense. We conduct such an exercise in Table 5B by predicting whether a given bank becomes a problem bank in a given quarter based on the average degree of inconsistency between regulator ratings in the past. We focus on problem bank status because of the limited number of actual bank failure occurrence in the sample. This specification intends to capture scenarios where a large difference between federal and state ratings for a given bank results in delayed intervention at the bank level, with the latter proxied by the given bank becoming a problem-bank. The explanatory variable, *Lagged Mean Difference*, is the lagged average difference between federal regulator and state regulator rating for a given bank. In constructing this variable, we use information from the time a given bank appears in our sample until the quarter before which we are trying to predict whether a bank becomes a problem bank or not. As can be observed from column (1), it is indeed the case that banks where federal and

[27] This notion behind using this measure and test is similar to the WaMu example we discussed in the introduction. In particular, delayed regulatory intervention was considered to be one important factor that led to a large discount on the value at which the assets of WaMu were eventually sold relative to what policy makers believed was the true value of these assets (reflected somewhat in the book value of assets).

state regulators differ in their ratings in the past are more likely to become problem banks in the future.

In the baseline specification we control for bank and quarter fixed effects to account for bank time invariant and macro effects that may affect bank survival probability. Nevertheless, it is possible that the relationship we find could reflect the (time-varying) state of the bank, which is not accounted for in these controls. To account for this possibility, we include the lagged average level of CAMELS ratings for the bank (*Lagged CAMELS*) in column (2). As can be observed, our results appear robust.

Our analysis has been predicated on the notion that the federal-state spread proxies for regulatory delays, implying a clear directional relation between the spread and problem banks—a higher difference should predict more distress. However, it is also possible that the results we find are a result of more complex banks—which are more likely to be in severe distress and also ones where regulators disagree often. Thus, we need to guard against the possibility that *Lagged Mean Difference* is just capturing more disagreement in ratings of federal and state regulators for more complex banks. We account for this possibility in column (3) by including lagged absolute value of the difference between the federal and state ratings (*Lagged Absolute Difference*), which captures the extent of disagreement between the regulators without capturing the direction of disagreement. Our main result remains—banks where federal and state regulators differ in their ratings in the past, with federal regulators being tougher than state regulators, are more likely to become problem banks in the future. The results are economically significant. Estimates from column (3) suggest that a one-standard-deviation increase in the federal-state spread increases the likelihood that a given bank becomes a problem bank in the future by 40%.

Admittedly, interpreting these patterns causally would require assumptions on how the federal-state spreads are assigned across states. Moreover, for each of these measures—for instance, the rate of problem banks—one can argue that to balance adequate risk taking in the economy, the optimal rate of problem banks needs to be higher than zero. This makes it difficult to conclude whether a less lenient supervisory stance of states relative to their federal counterparts is good or bad. Nevertheless, it is informative that all of the evidence points in the direction that the differences in how state and federal regulators apply regulatory ratings on banks may have real economic costs.

5.2 Is the Existing Regulatory Structure a Desirable Arrangement?

The findings so far can help inform on the efficiency of the existing structure of dual banking regulation. In general, however, even in the face of the evidence of Section 5.1 one could argue that multiple entities regulating a given bank in rotation might be a desirable arrangement. One reason for this argument could be that it might simply be efficient to monitor banks for more serious and less serious concerns at different frequency. A less thorough examination (say, by

state regulators) alternating with a more thorough one (by federal regulators) could likely capture the majority of relevant concerns every period without the need of constantly focusing on minor concerns that might arise only under thorough scrutiny. This arrangement could save supervisory costs and be nearly as effective as having competent regulators examine banks at all times. Alternatively, it might be the case that federal and state regulators have an implicit "good cop/bad cop" arrangement allowing for richer information gathering from banks— federal regulators' toughness allows for better information to be gathered by state regulators, which in turn potentially allows for better implementation of regulation.[28]

On balance the collage of evidence in Section 5.1 suggests that leniency of state regulators relative to their federal counterparts is related to costly consequences and likely proxies for delayed corrective actions. This evidence indicates that, both these rationales, although intriguing, are unlikely to be driving our findings. There are several additional pieces of evidence that reinforce this conclusion.

First, our analysis in Section 4 provides evidence that the first rationale is not likely. In particular, we note that Figure 4 shows that while federal regulators are significantly tougher than state regulators, there is also a counteraction of these downgrades by state regulators who are more likely to upgrade. This is hard to rationalize as an efficient arrangement involving a more thorough regulator examining banks infrequently, since in this setting the less thorough regulator would be unlikely to actively undo decisions of the more through regulator. Moreover, as we will show in Section 6, the extent of leniency of state regulators relative to federal regulators accentuates when banks confront adverse local economic conditions. This is hard to rationalize by the potential efficient arrangements as well. Such an arrangement is not likely to have a less thorough regulator supervising banks when this regulator is at its most lenient self and when the banking system needs thorough supervision the most. Moreover, it is also hard to envision reasonable theoretical arguments for this arrangement where regulatory inconsistencies would accentuate precisely at a time when the banking system likely needs consistent supervision.

Second, we are able to provide more evidence that supports our conclusion that the second rationale is not driving our findings either. In particular, we examine the change in regulatory behavior around the passage of the Riegle Act of 1994. At the introduction of the rotation policy, a bank moves from having simultaneous federal and state oversight every period to having federal and state oversight in alternation. This setting allows us to assess if the alternation arrangement is as effective as having the tougher, more competent, regulator examine the bank at all times. In particular, we can trace the changes in regulatory outcomes and bank behavior

[28] It is worth reiterating that, as discussed in detail in footnote 6, the good-cop bad cop scenario is unlikely given that the Riegle Act was predominantly motivated by red tape reduction. Nevertheless, to be comprehensive, we entertain this alternative in our discussion and in interpreting our evidence.

resulting from the change in regulatory structure. The assumption that is needed when making this comparison is that when a bank is supervised by both regulators concurrently in the period before the Riegle Act, the supervision philosophy of the more stringent regulator must dominate. This assertion is plausible, since in its absence banks would systematically fail examinations by the stricter regulator, a pattern we do not observe in the data. Under this assumption, the period around the passage of the Act provides us a setting where a bank moves from having a yearly on-site examination by the federal regulator to having the federal exam every two years.

Table 5C presents results that evaluate changes in supervisory ratings and bank balance sheet variables around the regulatory regime change using a difference-in-differences strategy. We track these outcomes for eight quarters before and after the first rotation following the Riegle Act.[29] The treatment group is composed of state-chartered banks that undergo a change from simultaneous federal and state oversight to an alternate federal and state oversight. The control group consists of national banks and thrifts regulated by the OCC and the OTS. These banks provide a reasonable control group because there was no major change in the structure of their regulation around the time period of our analysis. However, because national banks are large in size, we need to make sure that we focus on control banks that are as similar as possible to banks in the treatment group. We do so by selecting banks in the control group using propensity score matching. In particular, we construct the nearest neighbor-matched sample of OCC- and OTS-regulated banks based on the Mahalanobis distance metric. This approach employs a large set of matching covariates, including bank size, in the eight quarters in the pre-treatment period.[30] Thus, the difference-in-differences estimator we employ compares a state-chartered bank before and after the start of the rotation to its closest match among thrifts and national banks around the same event.

Our results show that, relative to the control group, state-chartered banks enjoy lower (i.e., better) CAMELS ratings after state and federal regulators begin rotating. The treatment banks marginally reduce their equity relative to assets, enjoy lower red-tape costs as measured by the lower expense ratio, and have marginally higher ROAs. State-chartered banks also display a reduction of the share of NPL and delinquencies reported in their balance sheets. Quantitatively,

[29] One comment about how we identified the event date is worth discussing. While a fraction of rotations between federal and state regulators for state-chartered banks start after the passage of the Riegle Act of 1994, there is a set of banks that were already undergoing alternate regulatory oversight before 1994. The reason for this alternation is *ad hoc* agreements between the federal and specific state regulators before the Riegle Act that allowed for rotation. Thus, we cannot rely on a single event date for the treatment in our analysis. Instead we identify the start of the rotation regime from the data, where the start of the alternation is always clearly detectable. We note, however, that we did not encounter any systematic correlation with the type of banks that started rotating before 1994, suggesting that idiosyncratic reasons were likely behind the differential initiation of the rotations.

[30] The covariates include including assets, liabilities, equity, and lagged CAMELS scores. Clearly, national banks and thrifts are, on average, very different from state banks. However, the national bank and thrift sample is sufficiently deep that matching a state bank on these covariates is very accurate.

the point estimates as well as the direction of the coefficients compares well with those in Table 2A and Table 4 and are generally larger in magnitude.[31]

This analysis demonstrates that while the alternation arrangement may have saved regulatory costs for supervisors and banks, it results in a more lenient regulatory regime when compared with a regime where a tougher, more thorough, regulator examines the bank at all times. As we have showed earlier in this section, such leniency in supervision seems to have, on balance, real costs and consequences. In Section 7 we discuss some of the lessons that emerge from this analysis for the on-going regulatory reform in the EU banking.[32]

6. Why Do Differences Exist Between Regulators?

Our findings so far have highlighted significant differences in the behavior of state versus federal regulators and provided evidence that suggests that there may be costs to such behavior. We have, however, been silent on why differences between state and federal regulators exist in the first place. In this section we exploit the significant regional heterogeneity and time-series variation in this behavior to shed light on this issue.

There are several broad factors that may drive a wedge between the behavior of state regulators and federal regulators. First, it might be the case that state regulators care more about the local economy—for instance, to preserve jobs both in banking and in the real economy—and as a result do not want to crack down on banks, especially at times of harsh economic conditions. Second, it might simply be the case that state regulators are more lax in rating banks because they lack resources—financial as well as human capital—to implement the regulation. Finally, state regulators might be lenient because they may be captured, *à la* Stigler (1971) and Peltzman (1976), by the banks they supervise. To streamline our discussion we follow the framework of Shleifer (1996) and refer to these potential reasons for lenient state regulator behavior as

[31] Note that the signs in this table are inverted relative to analysis in Tables 2A and Table 4. The reason is that our earlier analysis compared the changes in supervisory and bank outcomes when moving from a (lenient) state regulator to (tougher) federal regulator. In contrast, the analysis in Table 5C, we move from complete federal oversight (tougher) to more lenient oversight with federal regulator supervising the bank only "half" the time. Incidentally, this analysis provides external validation to our findings in Table 2A. The reason is that the variation employed here is different from the quasi-experiment used for identification in Section 4. Yet, we still find that ratings are tougher in a regime when federal regulators supervise the banks all the time relative to a regime where they face dilution of control due to the presence of more lenient local regulators.

[32] A final comment regarding the potential "good cop/bad cop" arrangement between federal and state regulators is worth making. Note that the informational gains due to such an arrangement should not hinge specifically on a rotation of good cop with a bad one, but rather should depend on the presence of two types of monitors (a tough and soft one). Recall, though, that at the introduction of the rotation policy around the passage of the Riegle Act of 1994, a state chartered bank moves from having simultaneous federal and state oversight every period to having federal and state oversight in alternation. In other words, the good and bad cop are present both before and after the Riegle Act. Hence, there is no particular reason to think that whatever informational benefits were available after the Riegle Act because of a "good cop/bad cop" rationale were not already present before the act. Thus, our analysis would suggest that, while the informational benefits from the "good cop/bad cop" arrangement did not change significantly around the Riegle Act of 1994, the costs in terms of supervisory laxity widened.

"control", "confusion", and "corruption." We now present empirical evidence to explore which of these plausible alternatives best explains the patterns observed in the data.

Control

We start our analysis by examining if state regulators are softer relative to federal regulators because they care more about local economy than their federal counterparts. We test this alternative by exploring if the federal-state spread is accentuated when the local economy is doing poorly, since these are instances when motives, such as preserving jobs in banking or in the real economy, should become more important. In particular, state regulators might be softer on banks during harsh economic times since increased likelihood of a bank closure (or a merger with a bigger out-of-state bank) may follow higher CAMELS ratings of banks, which could result in loss of local banking jobs and lending. In contrast, the federal regulators may care more about systemic stability than about the location of banking jobs or local credit availability.

Table 6A presents evidence from this analysis. We use the baseline CAMELS regression, including the interaction of a dummy that indicates federal regulator presence with a variable that captures the state of the local economy. We consider two such variables. The first variable, employed in columns (1) and (3), is the seasonally adjusted unemployment rate in the state of the bank under consideration (*Local UR*). The other variable, used in columns (2) and (3), is the annual house price growth rate based on the state house price index of the bank under consideration (*Local HPI*). In what follows, all controls are standardized, so that the coefficients indicate the economic impact of one standard deviation increase in the controls.

The estimate on the federal regulator presence dummy variable is positive, which is consistent with our earlier evidence and suggests that, on average, federal regulators are tougher than state regulators. More importantly for the purpose of testing the "control" hypothesis, we find that the interaction term for unemployment rate is positive, while the interaction term for house price growth is negative. This suggests that the federal-state spread is larger in states where the local economy is doing poorly. These are economically large magnitudes. In particular, the estimates in column (3) suggest that, all else equal, a one-standard-deviation increase in local unemployment results in the state regulators being more lenient relative to their federal counterparts by around 50%. Similarly, all else equal, a one-standard-deviation decline in local house price growth results in the state regulators being more lenient relative to federal regulators by around 20%.

These results reveal that state regulators are more likely to be soft on the banks in their jurisdiction when the local economy is doing poorly. Given that such periods may require tougher actions by regulators, the state-chartered regulatory system might be delaying timely intervention at critical junctures, as local regulators may find it ex post more costly to

implement such actions in harsh economic times. We revert to these results when we discuss the implications of our findings for optimal regulatory design in Section 7.

Confusion

Next, we assess if the softer ratings by state examiners could be due to lack of resources—financial or human capital—involved in implementing the regulation. It is not immediately obvious that lack of resources related to supervision in a given state would imply that examiners in that state are more lenient. For instance, lack of resources in a given state could result in more noisy, but unbiased, ratings by regulators in that state relative to federal regulators. However, it is certainly possible that examiners in states that invest less in supervisory resources, and therefore were less likely to receive signals about the adverse quality of a bank, could be systematically more lenient relative to their federal counterparts.

Table 6B follows our earlier approach and uses the baseline CAMELS regression, including the interaction of a dummy that indicates federal regulator presence with a variable that captures some aspect of the state regulatory system. In columns (1) and (3), we concentrate on four aspects of each state's supervisory system that are related to resources that state employs in supervision: (a) the state banking department budget relative to assets under supervision (*Budget Ratio*); (b) the ratio of the number of commercial bank examiners relative to the number of SMBs and NMBs in the state (*# Examiner Ratio*); (c) the percentage of the state department budget spent in training the examiners (*Training Ratio*); and (d) the percentage of commercial bank examiners with more than five years of experience (*% Experienced Examiner*). All information on these variables is obtained from the biannual Profile of State Bank Supervisors (Conference of State Bank Supervisors) spanning our sample period.

The results show that states with higher expenditure on staff training display less lenient behavior relative to federal regulators (i.e., state and federal regulators behave more similarly). This result is consistent with the notion that financial resources invested by a state in training its examiners are reflected in how the examiners rate the banks. In addition, states with a higher share of experienced examiners appear less lenient relative to their federal regulators. We interpret this result as suggesting that teams with a higher number of experienced examiners are better able to understand bank operations.[33] We find no systematic relation between leniency of state regulators relative to federal counterparts and the number of examiners per bank or the banking department budget per dollar of assets supervised in that state.

[33] This result could also be interpreted as being inconsistent with the "revolving-door" hypothesis—the notion that regulators might be soft on entities they regulate in hope for future career opportunities in such entities. Under the revolving-door argument one would expect more experienced examiners—ones who are more likely to garner future career opportunities at regulated entities—to be more lenient. However, as discussed, we do not find this to be the case. We will discuss this hypothesis in detail when we explore the "corruption" alternative later in this section.

In columns (2) and (3), we employ information from alternative sources to construct a measure that captures the quality of examiners in a given state regulatory agency. We construct this measure by using information on the career path of state examiners, with the subsequent move into the private financial sector signifying potentially higher quality of that examiner. To obtain this information we extract *all* the curricula vitae (CVs) of individuals who worked as state examiners during our sample period that are available on the networking website. We then use these CVs to assess if state examiners subsequently progressed into the private financial sector. Using this information, we construct a measure *Turnover* that captures the proportion of examiners in a given state who were able to find a subsequent job in the financial sector. Appendix 1 outlines the detailed procedure employed to extract, clean, and construct this measure. The quality of examiners significantly impacts the leniency of state regulators relative to their federal counterparts. Specifically, states where examiners are not as mobile into the financial sector—indicating worse quality of examiners—are also more lenient on banks.

Overall, the results in this section suggest that lack of financial and human resources might be resulting in more lenient state regulators relative to federal ones. The economic magnitudes of the finding are large, though smaller than what we obtained when we tested the "control" alternative. For instance, a one-standard-deviation increase in the quality of examiners, as measured by *Turnover*, results in the state regulators being softer than their federal counterparts by around 25%. Similarly, a one-standard-deviation decrease in expenditure on staff training display would result in 10% more lenient behavior of state regulators relative to federal regulators.

Corruption

We now evaluate whether state regulators might be softer on banks because they are potentially corrupt or captured by banks. In Table 6C, we employ the baseline CAMELS specification including the interaction of a dummy that indicates federal regulator presence with variables that proxy for the potential influence of special interest groups on regulators. We start by considering different measures of corruption and institutional quality that have been used in the previous literature. In particular, in columns (1) and (3) we use: (a) the measure of Glaeser and Saks (2006), which employs the federal convictions of government officials for corrupt practices to capture the propensity for misconduct in various states in the United States (*Corruption Measure*); (b) a state ranking of integrity created by the Better Government Association, which takes into account freedom of information laws, whistleblower protection laws, campaign finance laws, gifts, trips and honoraria laws, and conflict of interest laws (*Integrity Rank*); (c) a state's institutional quality score from Karabegovic and McMahon (2005), which is based on how secure property rights are, how fair and balanced its judicial system is, how strong contract enforcement is, and how effective are the limits on government's ability to transfer wealth through taxation and regulation (*Institutional Quality*); and (d) the average state and local expenditures per capita (*Expenditure per capita*), with Glaeser and Saks arguing that states with

poorer fiscal policy, and therefore higher expenditures compared with revenues, may have environments that are conducive to corrupt practices.

The results in columns (1) and (3) show that a state's corruption index, its integrity rank, and its institutional quality do not correlate with how lenient the state's examiners are relative to federal regulators. There is some evidence that states with poorer fiscal policy tend to have more lenient state bank regulators, though it is hard to conclude from this result that such states are more captured. In addition, in unreported tests we also experimented with other measures of corruption that have been used in prior literature (e.g. average tax burden in a state, defined as total state tax revenues as a percent of personal income). None of these measures explain variation in degree of leniency of state examiners relative to federal regulators in our sample.

In columns (2) and (3), we employ additional measures related to the organizational design of local regulators to explore the corruption alternative. First, we use information available from CSBS to construct measures on the internal governance of banking regulators. Specifically, we use information on how the funds available for banking regulators in a given state are allocated, appropriated, and spent. In particular, the authority for these tasks may be shared between the head of banking regulators in the state (the commissioner), the banking board, and/or determined based on legislation and/or statutes. For each state we employ four dummy variables that take a value of 1 if the authority is determined by the banking commissioner (*Budget by Commissioner*), the banking board (*Budget by Board*), through statutes (*Budget by Statute*), or legislation (*Budget by Legislate*) respectively.

Second, we assess the commonly discussed reason for leniency of regulators that relates to the potential revolving doors between the regulators and entities they regulate. We capture the possibility of this alternative by using the job turnover measure *Turnover* that, as explained earlier, is the proportion of examiners in a given state who were able to find a subsequent job in the financial sector. Finally, we construct two measures that are related to the organization structure of the examination team. Here we are motivated by the literature that argues that there should be a connection between centralized and hierarchical organizations and the extent of corruption they promote (Shleifer and Vishny 1993). We proxy for the hierarchical structure of local regulators by using standard measures of organizational span and depth. We construct these by using information that we obtain from scraping the official websites of individual state regulatory agencies. As explained in detail in Appendix 2, we use this source to construct top management span of a state regulator's organization as the average number of examiners per manager during our sample period (*Organization Span*). In addition, we construct a measure of depth of a local regulator's organization as the number of layers between the top manager and the examiner at the entry level (*Organization Depth*).

The results reveal that states where legislative agency is involved in governance of funds tend to have more lenient state examiners. This may suggest potential pressure on regulators from banks through the legislature. However, these effects are moderated in the presence of statutes as well as a banking board. More importantly, when we consider all the variables together in column (3), none of these effects survives. In addition, the results also refute the revolving-door hypothesis. In particular, states with lenient regulators are not the ones where regulators are more likely to find a career opportunity in the financial sector. Rather, these states had a lower turnover rate into the financial sector. As explained earlier, this finding potentially supports the notion that these states have examiners of worse quality. Last, there is some evidence that flatter organizations — organizations with more top management span and less organization depth — are less soft on banks. However, these effects are not statistically significant when considered with other variables in column (3). Overall, the evidence in this section provides no support for corruption of banking regulators per se as the economic force that drives meaningful heterogeneity in leniency of state regulators relative to their federal counterparts.

Other Bank-Level Evidence

We end this section by discussing two additional factors that could also explain the behavior of state regulators relative to federal ones. We discuss this evidence separately because, while useful, these factors will not help separate the control, confusion, and corruption hypotheses. The first factor we consider relates to the difference in the nature of payments across state and federal regulators for their supervision activity. In particular, while states finance their prudential supervision efforts through the use of assessment fees, the Fed and the FDIC are not funded through assessment fees and receive no payment from member or nonmember banks for their on-site examinations. It is worth noting that mere presence of fees for state regulators does not immediately imply that there should be a leniency on the part of local regulators relative to federal ones. In particular, reputational effects could provide a strong reason for state regulators to care about the accuracy of their supervisory activity. Moreover, federal regulators carry out other activities which interact with their supervisory role and, like fees for local supervisors, could potentially make them lenient in their supervisory decisions relative to state regulators.[34]

We assess if such fees might be important in influencing the leniency of state regulators relative to the federal ones. We do not have information on the exact fees collected by state regulators. However, we assess if state regulators are more lenient toward larger banks since assessment fees collected by state regulators for their supervisory activity are proportional to bank assets (Blair and Kushmeider 2006).

[34] See the Federal Reserve Chairmen (Bernanke, 2010; Greenspan, 1997), Peek, Rosengren and Tootell (1999) and White (2011) for discussion on impact of monetary policy decisions of the Fed and its supervisory activities and Goodhart 2001 for FDIC's role in setting premia on deposit insurance and its supervisory activity.

In column (1) of Table 6D we estimate the baseline CAMELS specification including the interaction of a dummy that indicates federal regulator presence with the size of the bank being supervised (*Size*). In addition, we also assess if there might be any leniency depending on how large the lending portfolio of the bank is relative to its assets by including an interaction of the dummy for federal regulator presence with the loans-to-assets ratio of the bank (*Loans/Assets*). While state regulators on average are lenient relative to their federal counterparts, this leniency is accentuated for larger banks. Specifically, the estimate on the interaction term suggests that, relative to their federal counterparts, state regulators are lenient by about 30% more when dealing with banks whose size is larger by one standard deviation. This finding is consistent with the corruption hypothesis that we outlined earlier because big banks pay more fees to state regulators.[35] However, the evidence is also consistent with the control hypothesis, since big banks employ and lend more in the aggregate. Moreover, because relocation and charter-switching costs are largely fixed, large banks are also more likely to escape state regulator jurisdictions, vis-à-vis smaller banks. Finally, this evidence is potentially consistent with the confusion hypothesis, since big banks are also more complex entities to understand.

Next, we consider whether ownership of the bank by local constituents impacts its assessment by state regulators relative to federal ones. In column (2), we use a specification similar to that used in the first column, with the difference being that here we interact the federal agency indicator with a dummy for whether the bank is publicly traded or privately held (*Public*). We find that the difference in the federal-state spreads for CAMELS ratings is significantly smaller for publicly traded entities than for private banks. This finding is consistent with the control hypothesis since private banks are likely to be funded by constituents within state boundaries. However, this is not the only explanation for these results. This evidence also supports the confusion hypothesis since publicly traded banks might be easier to evaluate, given that other signals about their quality—such as market prices, equity, and bond ratings—are available to regulators.

Overall, we find support for the control and confusion hypotheses as driving a large part of state regulator behavior when compared with the federal ones. In particular, we find that state regulators care about the local economy and as a result do not crack down on banks as much as federal regulators. Notably, local unemployment has the largest economic effect when explaining state regulator behavior across the various alternatives we explored. There is also significant evidence that state regulators are softer in rating banks because they lack financial as well as human capital to implement the regulation. Finally, we are able to show that there is no support for the corruption hypothesis, which includes “revolving doors” as a reason for leniency of state regulators.

[35] Even if state regulators charge for exams, such resources may not be necessarily earmarked for bank supervision and may accrue to a general fund. However, state regulators may still care about the size and relevance of the entities overseen, for instance to justify budgetary and personnel appropriations.

7. Broader Applicability and Implications for Optimal Regulatory Design

7.1 How Broadly Applicable Are Our Findings? Analysis Including All Banks and Thrifts

Our analysis so far makes inferences based on the quality of supervision under state and federal regulators for state chartered banks. It is natural to ask how our inferences would change if we were to include bank movements into and out of state charter. Moreover, we have not discussed the external validity of our estimates—that is, how our results would apply to an average bank in the economy. This analysis requires considering a wider sample of banks potentially facing a set of regulators outside state charter (i.e. the OCC and the OTS). We now undertake this task.

We begin by considering the sample of all state and federally chartered banks and thrifts that are available in the Fed's NIC universe. In Table 7A we regress the CAMELS ratings for these institutions on dummies indicating the identity of each regulator. As in our main regression (Table 2A), state regulators are the omitted category, but federal regulators now also include the OCC and OTS, which oversee federally chartered banks and thrifts, respectively. The coefficients on *Fed, FDIC, OCC,* and *OTS* in the regressions represent the average rating of these regulators relative to the average state regulator. As previously noted, banks can select into different regulatory environments through their charter choice. Thus, the estimates on regulator variables from this (naïve) regression may reflect differences in regulator behavior or heterogeneity in the set of banks supervised by different regulators. We attempt to account for some of this heterogeneity by including a variety of bank observables that measure a bank's regulatory capital adequacy, profitability, loan book quality, growth, and size. Specifically, we include Tier1 and leverage ratios, ROA, expense ratio, delinquency and nonperforming loan rates, loan growth, and the logarithm of assets. In addition, we also include bank and time fixed effects. Bank fixed effects allow us to account for any time invariant bank specific factors that may be driving certain type of banks into selecting a particular type of regulator. By focusing on within-bank variation, bank fixed effects *de facto* identify the coefficients of regulator dummies based on switches of the same bank in and out of a specific regulator's jurisdiction. This would typically be the case for the state chartered banks due to the rotation policy, but in our expanded sample could also be driven, for instance, by national banks becoming thrifts or state chartered banks becoming national banks. Time fixed effects account for the fact that regulators may be supervising a different part of the bank universe at different points in time.

Column (1) presents regression estimates from a pooled regression that shows that CAMELS ratings in exams by the Fed and the FDIC are once again higher (that is, worse) than exams by state regulators. Interestingly, the ratings are also higher after OCC and OTS exams, indicating that ratings assigned by federal regulators are higher than those given by state regulators in the universe of all exams and all banking institutions. As mentioned earlier, this finding may indicate that state banking departments tend to be more lenient than their federal counterparts. However, it may also be the case that the pool of banks that state regulators face is simply different. Indeed, while we account for bank observables in the regression, we find that the point estimates for the

Fed and the FDIC are larger than those in Table 2A. Given the tight identification used earlier, the difference in estimates across federal and state regulators may partly reflect bank heterogeneity.

Next, in columns (2) through (4), we exploit within-quarter and within-bank variation to make the pooled analysis progressively more comparable to the one conducted in Table 2A. In particular, note that the federal regulators we analyzed earlier (the Fed and the FDIC) still appear to be tougher than state regulators. By column (4), which includes both bank and quarter fixed effects, the magnitudes of the estimates of the strictness of the Fed and the FDIC relative to state regulators are similar and statistically indistinguishable when compared to those in Table 2A (discussed in Section 4.1). Notice that the difference between the sample used in this section and that used in Section 4.1 is that here we allow the bank movements in and out of state charter (to thrift or federal charter). This implies that the nature of unobservable factors that drive the bank sorting decision into and from the state charter during our sample might be time-invariant. The reason is that if such movements did depend on time-varying unobservable factors, the estimates on the Fed and the FDIC would likely differ significantly between Table 2A and column (4) of Table 7A because the latter would also reflect variation from charter switchers.[36]

This analysis offers an insight that is relevant for the literature on regulatory shopping and bank sorting. Specifically, it shows that inclusion of bank and quarter fixed effects may be a sufficient correction to account for charter shopping. Notably, this conclusion was possible only because our earlier results provided a well-identified causal benchmark for the behavior of regulators when faced with state-chartered banks.

Although our analysis suggests that selection of banks into and out of state charters is accounted for by bank and quarter fixed effects, we have not discussed the external validity of our estimates. In other words, how would our results apply to an average bank in the economy? This is a difficult question to answer because it requires knowing how the quality of banks in the state-chartered system—on both observables and unobservables—compares to the quality of an average bank in the economy. The estimates we obtained in Table 2A could be lower for an average bank in the economy, were it the case that weaker banks chose state charters. The reason is that weaker banks would be more likely to be rated harshly by the tougher federal regulators—thus accentuating the rating difference relative to what an average bank might receive. In contrast, if weaker banks selected national charters, the estimates for an average bank in the economy could be higher than what we found in Table 2A.

[36] The coefficients on the OCC and OTS change with bank and quarter fixed effects and become insignificant. We are cautious in not making any conclusions based on these estimates since we do not have a benchmark, well identified, estimate similar to one in Table 2A that we can compare these results to.

While we cannot definitively know how the quality of banks in state charter compares to the quality of banks in the average population, we do find evidence that the differences in regulator behavior across states impact a bank's charter choice. In particular, in Table 7B we assess if there is a relation between entry of banks in a state and the extent of leniency of local regulators in that state relative to federal ones. We conduct this analysis using our baseline CAMELS regression. We include the interaction of a dummy that indicates federal regulator presence with a variable that captures number of new SMB/NMB—either through new charters or relocations—in the same state as the bank under consideration, averaged over our sample period (*SMB/NMB Entry*). We also account for the size of the banking sector by including the average number of existing banks over the sample period in the same state as the bank under consideration (*# SMB/NMB*). As is evident from both columns in Table 7B, states with significantly more new bank entries are also the ones where local regulators are softer relative to federal ones. Thus, the choice of banks across various states is related to the regulatory rating environment inside that state. We will revert to this finding when we discuss the implications for optimal regulation next.

7.2 Implications for Optimal Regulation

This paper shows large and significant differences in how regulators implement identical rules due to differences in their "will"—i.e. their institutional design and incentives. Our identification strategy allows us to conclude that these differences in regulatory outcomes reflect regulators' views and incentives rather than bank heterogeneity. We show that the differences in regulatory behavior are important because banks respond to them. Moreover, real consequences are related to differences in regulator behavior. States with more lenient local regulators relative to their federal counterparts experience higher likelihood of bank failures and costs of bank distress. In addition, a greater difference between local and federal regulator ratings for a given bank likely proxies for regulatory delays, since it makes it more likely that a given bank subsequently ends in problem bank status. We investigate the reasons for this discrepancy in regulator behavior and find that one main reason why state regulators do not crack down on banks as much as federal regulators is that they put more weight on the local economy. There is also significant evidence that some state regulators are softer in rating banks because they lack financial as well as human resources in supervision. There is no support for the corruption hypothesis, which includes the commonly discussed revolving doors as a reason for leniency of regulators.

Our main analysis is conducted on state-chartered banks. As mentioned earlier, these banks account for the vast majority of depository institutions in the U.S. and a very large fraction of overall bank assets. In addition, state charters remain the most common chartering type for *de novo* banks today, accounting for about 85% of all new banks in 2010. Episodes of systemic risk have historically been associated with either failure of one or more very large financial institutions (e.g. the U.S. in 2008) or troubles with a large number of smaller institutions (e.g. the U.S. savings and loan crisis during the 1980s, or *cajas des arrojo* in Spain in 2011). Thus, the

results of this paper are directly applicable to the part of the banking sector that is important both in terms of its economic size as well as in terms of its impact on financial stability.

At the same time, our results have implications for banking regulation of banks outside state charters. In particular, because in a dual banking system banks can pick their charter, understanding the optimal regulation of large banks in national charters cannot be done in a vacuum without understanding regulation inside state charters. In general, large banks tend to choose federal charters in order to avoid dealing with different state regulators when operating across state borders; in contrast, smaller banks tend to choose state charters because they are cheaper to maintain and local regulators are more easily accessible (e.g. Bierce 2007 and Blair-Kushmeider 2006). Nonetheless, the U.S. banking system has experienced a continuous osmosis of banks, both large and small, from one charter to another. For example, among the largest institutions, Chase Manhattan Bank switched to a state charter in 1995, and its successor, JPMorgan Chase Bank, returned to a national charter in 2004. Similarly, a large number of small banks have switched from federal to state charters, reportedly following the merger of the OTS and OCC in October 2011. The movement of banks between national and state charters makes the behavior of regulators inside each of these systems interdependent. Our paper takes the first step in this direction by demonstrating that in state charters, banks face a tougher regulator only half the time. This suggests that banks that remain in the national charter must be garnering benefits that are large enough to offset the lenient supervisory treatment they might otherwise obtain in the state charter. Understanding and quantifying these benefits remains a fruitful area of future research.

Our findings cannot directly speak to whether having competing regulators in a banking system is optimal. However, the difference-in-difference experiment in Table 5C does come close to replicating a scenario where we move from a regime with a single regulator to a regime where multiple heterogeneous regulators share oversight. After the Riegle Act of 1994, the stricter arm's length regulator faces pressure on its supervisory decisions not only due to potential charter shopping decisions of banks, but also due to dilution of control from the presence of more lenient local regulators. Thus, sharing oversight among regulators may also have costs, similar to what competition among regulators introduces via a “race to the bottom” in terms of regulatory laxity.

More broadly, our findings speak to the current debate on the redesign of banking regulation in Europe.[37] Based on current proposals of a supernational banking union, the European regulatory system could acquire very similar features to state charter banking in the U.S., with state supervisors continuing to act as the sole chartering authority and a dual supervisory system

[37] Our findings could also speak to similar issues in other regulated industries, such as insurance. While insurance is currently regulated solely at the state level, Congress has on several occasions introduced proposals for a “federal charter” for insurance companies. Our results on inconsistent regulatory oversight—with more stringent federal regulators—could be informative on the potential consequences of such reforms.

composed of national and a single supranational, or "federal," European authority. As discussed by Garicano (2012), the impetus for this redesign follows the European banking crisis that resulted in a loss in reputation of national supervisors, who appeared unwilling to take prompt corrective actions at key junctures of the European banking crisis. Our findings can help understand the tradeoffs involved in the allocation of supervisory powers and responsibilities in this new redesigned dual system. It is reasonable to assume that national regulators in Europe, who have been the sole supervisors for many years, have an informational advantage relative to federal supervisory authority. However, our findings highlight that regulators' "will" is critical in determining its behavior. In particular, local regulators are more likely to overweight local constituents, and particularly so in tough economic conditions. These patterns are likely to be binding for larger banks that may be "too big to fail" for their local economies. An optimal dual regulatory arrangement for Europe will need to efficiently trade off the experience of local (national) supervisors with the local regulator bias which makes it softer toward local banks. Thus, if prompt corrective intervention is an important goal of banking regulation, our findings suggest that the new regulatory design should bake in tripwires to allow for intervention by arm's-length regulators, especially in tough times and for larger institutions.

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Table 1: Summary Statistics of State Member Banks and Non-state Member Banks

The table presents the summary statistics. Our sample restricts the data to state and non-state member banks that have switched regulators at least once since 1996:Q1. We also remove observations that correspond to CAMELS ratings of 3 or greater in the most recent exam, concurrent exams by the State and the Federal Regulator, and outlier banks. The last column reports the t-statistics of a test of difference in the means.

	State Member Banks (SMBs)						
	Rotating SMB, starting FED			Rotating SMB, starting STATE			
Bank variables, 1996:Q1	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**Difference t-stat**
Tier1 RBCR	250	17.435	8.562	264	17.435	8.274	0.00
Leverage Ratio	250	10.314	3.067	265	10.427	2.973	0.43
ROA	251	1.253	0.521	265	1.207	0.519	-0.99
Efficiency Ratio	251	61.273	14.477	265	61.848	13.099	0.47
Delinquency rate	251	2.546	2.037	265	3.068	2.363	2.68
Non performing to loans	251	0.878	1.027	265	1.123	1.268	2.40
% Loan Growth	249	1.725	6.291	265	1.823	5.959	0.18
CAMELS rating	251	1.566	0.550	265	1.566	0.519	0.01
	Non-state Member Banks (NMBs)						
	Rotating NMB, starting FDIC			Rotating NMB, starting STATE			
Bank variables, 1996:Q1	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**Difference t-stat**
Tier1 RBCR	1940	17.521	8.918	2255	17.456	8.310	-0.24
Leverage Ratio	1944	10.488	3.421	2257	10.480	3.286	-0.08
ROA	1944	1.262	0.597	2262	1.283	0.596	1.13
Efficiency Ratio	1944	60.291	12.908	2264	60.039	13.529	-0.61
Delinquency rate	1946	2.970	2.506	2263	2.890	2.342	-1.07
Non performing to loans	1944	1.061	1.327	2263	1.028	1.263	-0.83
% Loan Growth	1936	1.237	5.803	2258	1.211	5.550	-0.15
CAMELS rating	1948	1.539	0.523	2266	1.553	0.522	0.90

Table 2: Impact of Supervisor Identity on CAMELS Ratings

The table reports the results from an OLS regression that examines the effect of the federal regulator being the lead regulator on supervisory exam on combined CAMELS rating (Panel A) and its subcomponents (Panel B). Our sample restricts the data to state and non-state member banks that have switched regulators at least once since 1996:Q1. We also remove observations that correspond to CAMELS ratings of 3 or greater in the most recent exam, concurrent exams by the State and the Federal Regulator, and outlier banks. We include quarter and bank fixed effects and the errors are clustered at the state level. *** significant at 1% level. ** significant at 5% level. * significant at 10% level. Sample 1996:Q1-2010:Q4.

Panel A: Combined CAMELS Ratings

	(1)	(2)	(3)	(4)
	Combined CAMELS	**Combined CAMELS**	**Combined CAMELS**	**Combined CAMELS**
Within-bank mean	1.753	1.694	1.700	1.694
Within-bank SD	0.304	0.312	0.311	0.296
FRB	0.096***			
	[0.016]			
FDIC		0.095***		
		[0.012]		
Federal Agency			0.095***	0.081***
			[0.011]	[0.009]
Other Controls				Yes
Cluster	State	State	State	State
Fixed effects	Quarter	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID	Bank ID
Observations	5161	39941	45102	44213
Adjusted R-squared	0.507	0.470	0.474	0.570
# of banks	731	5895	6626	6558
# of clusters	41	50	50	49

Table 2: Impact of Supervisor Identity on CAMELS Ratings (contd.)

Panel B: Sub-components of CAMELS Ratings

	(1)	(2)	(3)	(4)	(5)	(6)
	Capital rating	**Asset rating**	**Management rating**	**Earnings rating**	**Liquidity rating**	**Sensitivity rating**
Within-bank mean	1.501	1.578	1.809	1.899	1.573	1.690
Within-bank SD	0.324	0.373	0.299	0.330	0.298	0.274
Federal Agency	0.074***	0.083***	0.119***	0.078***	0.057***	0.083***
	[0.010]	[0.016]	[0.010]	[0.011]	[0.009]	[0.008]
Cluster	State	State	State	State	State	State
Fixed effects	Quarter	Quarter	Quarter	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID
Observations	45102	45102	45102	45102	45102	39203
Adjusted R-squared	0.461	0.402	0.432	0.491	0.468	0.405
# of banks	6626	6626	6626	6626	6626	6308
# of clusters	50	50	50	50	50	50

Table 3: Tabulation of composite CAMELS upgrades and downgrades

The table reports the summary statistics of the upgrades and downgrades in the SMBs (FRB/State), in the NMBs (FDIC/State) and in the SMBs and NMBs together (Federal Agency/State), conditional on observing change in composite CAMELS ratings. Our sample restricts the data to state and non-state member banks that have switched regulators at least once since 1996:Q1. We remove concurrent exams by the State and the Federal Regulator, and outlier banks. We also report the statistics with (CAMELS downgrade) and without removing observations that correspond to CAMELS ratings of 3 or greater in the most recent exam (CAMELS harsh downgrades). Sample 1996:Q1-2010:Q4.

SMBs, FRB-STATE rotating

	CAMELS upgrade		CAMELS downgrade		CAMELS harsh downgrade	
	Freq.	**Percent**	**Freq.**	**Percent**	**Freq.**	**Percent**
FRB	111	35	476	73	199	73
STATE	206	65	179	27	75	27
Total	317	100	655	100	274	100
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
ΔCAMELS	-1	0	1.09	0.33	1.22	0.49

NMBs, FDIC-STATE rotating

	CAMELS upgrade		CAMELS downgrade		CAMELS harsh downgrade	
	Freq.	**Percent**	**Freq.**	**Percent**	**Freq.**	**Percent**
FDIC	1221	46	3189	60	1687	69
STATE	1413	54	2102	40	769	31
Total	2634	100	5291	100	2456	100
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
ΔCAMELS	-1	0	1.13	0.39	1.29	0.54

Federal Agency-STATE rotating (SMBs and NMBs)

	CAMELS upgrade		CAMELS downgrade		CAMELS harsh downgrade	
	Freq.	**Percent**	**Freq.**	**Percent**	**Freq.**	**Percent**
Federal	1332	45	3665	62	1886	69
STATE	1619	55	2281	38	844	31
Total	2951	100	5946	100	2730	100
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
ΔCAMELS	-1	0	1.13	0.38	1.28	0.53

Table 4: Impact of Supervisor Identity on Bank Variables

The table reports the results from an OLS regression that examines the effect of federal agencies being the lead regulator on supervisory exam on the balance sheet variables of the banks. Column 1 looks at the Tier 1 RBCR, column 2 looks at the Leverage ratio, column 3 looks at Expense ratio, column 4 looks at the ROA, column 5 looks at Non-performing loans, and column 6 looks at delinquency rates and column 7 looks at loan growth. Our sample restricts the data to state and non-state member banks that have switched regulators at least once since 1996:Q1. We also remove observations that correspond to CAMELS ratings of 3 or greater in the most recent exam, concurrent exams by the State and the Federal Regulator, and outlier banks. We include quarter and bank fixed effects and the errors are clustered at the state level. *** significant at 1% level. ** significant at 5% level. * significant at 10% level. Sample 1996:Q1-2010:Q4.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Tier1 RBCR	**Leverage Ratio**	**Expense Ratio**	**Return on Assets**	**NPL to total loans**	**Delinquency Rate**	**Loan Growth**
Within-bank mean	16.089	10.435	67.075	0.955	1.161	2.657	2.959
Within-bank SD	2.611	1.282	7.553	0.468	0.845	1.139	2.861
Federal Agency	0.066*	0.047*	0.322***	-0.017***	0.038***	0.044**	-0.049
	[0.038]	[0.024]	[0.093]	[0.006]	[0.011]	[0.017]	[0.052]
Cluster	State	State	State	State	State	State	State
Fixed effects	Quarter	Quarter	Quarter	Quarter	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID
Observations	222824	223104	223203	222740	222749	223496	222112
Adjusted R-squared	0.807	0.767	0.535	0.393	0.355	0.441	0.163
# of banks	6609	6611	6619	6619	6604	6616	6595
# of clusters	49	49	49	49	49	49	49

Table 5: Assessing costs and benefits of inconsistent regulation

This table reports the results from an OLS regression that examines the effect of the federal regulators being the lead regulatory agency on CAMELS rating. Panel A assesses the costs and benefits of inconsistent rating by the two regulators on state level variables that include bank failure rate, problem bank rate, TARP Repayment rate and Asset Sale Discount. Panel B presents bank level regression that predicts the propensity of a bank to become a problem bank in a given regulatory spell as a function of average lagged CAMELS Federal-state spread at the bank level. Our sample restricts the data to state and non-state member banks that have switched regulators at least once since 1996:Q1 . We also remove observations that correspond to CAMELS ratings of 3 or greater, concurrent exams by the State and the Federal Regulator, and outlier banks. Panel C presents results from a difference-in-difference estimation around the passage of Riegle Act. The treatment group consists of state chartered banks that begin rotating around the passage of the Act. The control group consists of a matched sample of national chartered banks. The dependent variables are CAMELS, Equity to Assets ratio, Efficiency ratio, ROA, Non-performing loans, and Delinquency rates and column 7 looks at loan growth. More details on the empirical strategy are in the text. *** significant at 1% level. ** significant at 5% level. * significant at 10% level. Sample 1996:Q1-2010:Q4.

Panel A: Costs and Benefits using State Level Variables

	(1)	(2)	(3)	(4)	(5)
	Combined CAMELS				
Federal Agency	0.094***	0.094***	0.093***	0.095***	0.092***
	[0.011]	[0.010]	[0.010]	[0.010]	[0.009]
Federal Agency * Failure Rate	0.037***				0.001
	[0.010]				[0.012]
Federal Agency * Problem Bank Rate		0.060***			0.054***
		[0.008]			[0.009]
Federal Agency * TARP Repayment			-0.019*		-0.016
			[0.011]		[0.010]
Federal Agency * Asset Sale Discount				0.013**	0.016**
				[0.006]	[0.007]
Cluster	State	State	State	State	State
Fixed Effects	Quarter	Quarter	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID
Observations	45063	45102	40822	44016	39999
Adjusted R-squared	0.479	0.487	0.481	0.473	0.493
# of banks	6618	6626	5994	6451	5865
# of clusters	49	50	41	46	39

Table 5: Assessing costs and benefits of inconsistent regulation (contd.)

Panel B: Costs and Benefits using Bank Level Variables

	(1)	(2)	(3)
	Pr(Bank becomes a Problem Bank in a quarter)		
Within-bank mean		0.028	
Within-bank SD		0.128	
Lagged Mean Difference	0.120***	0.063***	0.057***
	[0.022]	[0.014]	[0.014]
Lagged CAMELS		0.122***	0.120***
		[0.011]	[0.010]
Lagged Absolute Difference			0.036***
			[0.009]
Cluster	State	State	State
Fixed Effects	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID
Observations	160067	160067	160067
Adjusted R-squared	0.265	0.399	0.400
# of banks	4992	4992	4992
# of clusters	48	48	48

Panel C: Costs and Benefits using Difference in Difference around Riegle Act

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Combined CAMELS	**Equity to Assets**	**Expense Ratio**	**Return on assets**	**NPL to total loans**	**Delinquency rate**	**Loan Growth**
Post Riegle Act	-0.081***	-0.020	-0.018***	0.033	-0.151***	-0.181***	0.098
	[0.010]	[0.036]	[0.003]	[0.021]	[0.033]	[0.048]	[0.149]
Fixed effects	Quarter	Quarter	Quarter	Quarter	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID	Bank ID
Observations	13561	13936	13908	13815	13902	13931	13159
Adjusted R-squared	0.004	-0.000	0.002	0.000	0.001	0.001	-0.000
# of banks	1033	1031	1033	1032	1033	1033	1031

Table 6: Why do differences exist between regulators?

The table reports the results from an OLS regression that examines the effect of federal regulators being the lead regulator on the supervisory exam on CAMELS ratings. Panels A, B and C test the Control, Confusion and Corruption hypothesis outlined in the text. Panel D presents additional evidence using bank level data. Our sample restricts the data to state and non-state member banks that have switched regulators at least once since 1996:Q1. We also remove observations that correspond to CAMELS ratings of 3 or greater in the most recent exam, concurrent exams by the State and the Federal Regulator, and outlier banks. We include quarter and bank fixed effects and the errors are clustered at the state level. *** significant at 1% level. ** significant at 5% level. * significant at 10% level. Sample 1996:Q1-2010:Q4.

Panel A: Control

	(1)	(2)	(3)
	Combined CAMELS		
Federal Agency	0.095***	0.095***	0.096***
	[0.011]	[0.011]	[0.011]
Federal agency * Local UR	0.065***		0.054***
	[0.009]		[0.010]
Federal agency * Local HPI		-0.050***	-0.021**
		[0.010]	[0.008]
Cluster	State	State	State
Fixed Effects	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID
Observations	45063	45063	45063
Adjusted R-squared	0.483	0.480	0.484
# of banks	6618	6618	6618
# of clusters	49	49	49

Panel B: Confusion

	(1)	(2)	(3)
	Combined CAMELS		
Federal Agency	0.096***	0.094***	0.095***
	[0.011]	[0.010]	[0.010]
Federal Agency * Budget Ratio	-0.002		-0.003
	[0.004]		[0.004]
Federal Agency * # Examiner Ratio	0.007		0.002
	[0.006]		[0.004]
Federal Agency * Training Ratio	-0.010*		-0.007
	[0.006]		[0.007]
Federal Agency * % Experienced Examiner	-0.013*		-0.015*
	[0.007]		[0.008]
Federal Agency * Turnover		-0.023*	-0.026**
		[0.012]	[0.011]
Cluster	State	State	State
Fixed Effects	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID
Observations	43153	43020	41615
Adjusted R-squared	0.474	0.548	0.549
# of banks	6353	6298	6097
# of clusters	45	40	37

Table 6: Why do differences exist between regulators? (contd.)

Panel C: Corruption

	(1)	(2)	(3)
	Combined CAMELS		
Federal Agency	0.090**	0.107***	0.094***
	[0.036]	[0.010]	[0.023]
Federal Agency * Corruption Measure	0.002		-0.009
	[0.009]		[0.010]
Federal Agency * Integrity Rank	0.011		0.009
	[0.010]		[0.010]
Federal Agency * Institutional Quality	0.010		0.009
	[0.009]		[0.010]
Federal Agency * Expenditure per capita	0.070***		0.059***
	[0.010]		[0.012]
Federal Agency * Budget by Commissioner		0.001	0.005
		[0.013]	[0.011]
Federal Agency * Budget by Board		-0.027**	-0.014
		[0.012]	[0.009]
Federal Agency * Budget by Statue		-0.029**	-0.010
		[0.014]	[0.011]
Federal Agency * Budget by Legislate		0.027**	0.004
		[0.012]	[0.011]
Federal Agency * Organization Span		-0.020*	-0.014
		[0.012]	[0.012]
Federal Agency * Organization Depth		0.002	0.003
		[0.005]	[0.003]
Federal Agency * Turnover		-0.022**	-0.022*
		[0.009]	[0.012]
Cluster	State	State	State
Fixed Effects	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID
Observations	40440	39216	36350
Adjusted R-squared	0.482	0.473	0.479
# of banks	6331	5978	5799
# of clusters	47	39	39

Table 6: Why do differences exist between regulators? (contd.)

Panel D: Other Bank Level Evidence

	(1)	(2)	(3)
	Combined CAMELS		
Within-bank mean			
Within-bank SD			
Federal Agency	0.094***	0.095***	0.094***
	[0.011]	[0.011]	[0.011]
Federal agency * Size	0.034***		0.041***
	[0.008]		[0.008]
Federal agency * Loans/Assets	0.000		0.002
	[0.006]		[0.006]
Federal agency * Public		-0.009*	-0.022***
		[0.005]	[0.005]
Cluster	State	State	State
Fixed Effects	Quarter	Quarter	Quarter
	Bank ID	Bank ID	Bank ID
Observations	45034	45102	45034
Adjusted R-squared	0.479	0.474	0.479
# of banks	6615	6626	6615
# of clusters	49	50	49

Table 7: Broader Applicability

Panel A reports the results from an OLS regression with CAMELS as the dependent variable and indicator for whether FRB, FDIC, OCC or OTS is the lead regulator as the main explanatory variables (State regulator is the omitted category). Controls include ROA, Tier 1 capital ratio, Log(Assets). Panel B reports the results from an OLS regression that examines the effect of federal regulators being the lead agencies on CAMELS ratings The data includes all banks starting 1996:Q1. Standard errors are clustered at the state level. *** significant at 1% level. ** significant at 5% level. * significant at 10% level. Sample 1996:Q1-2010:Q4.

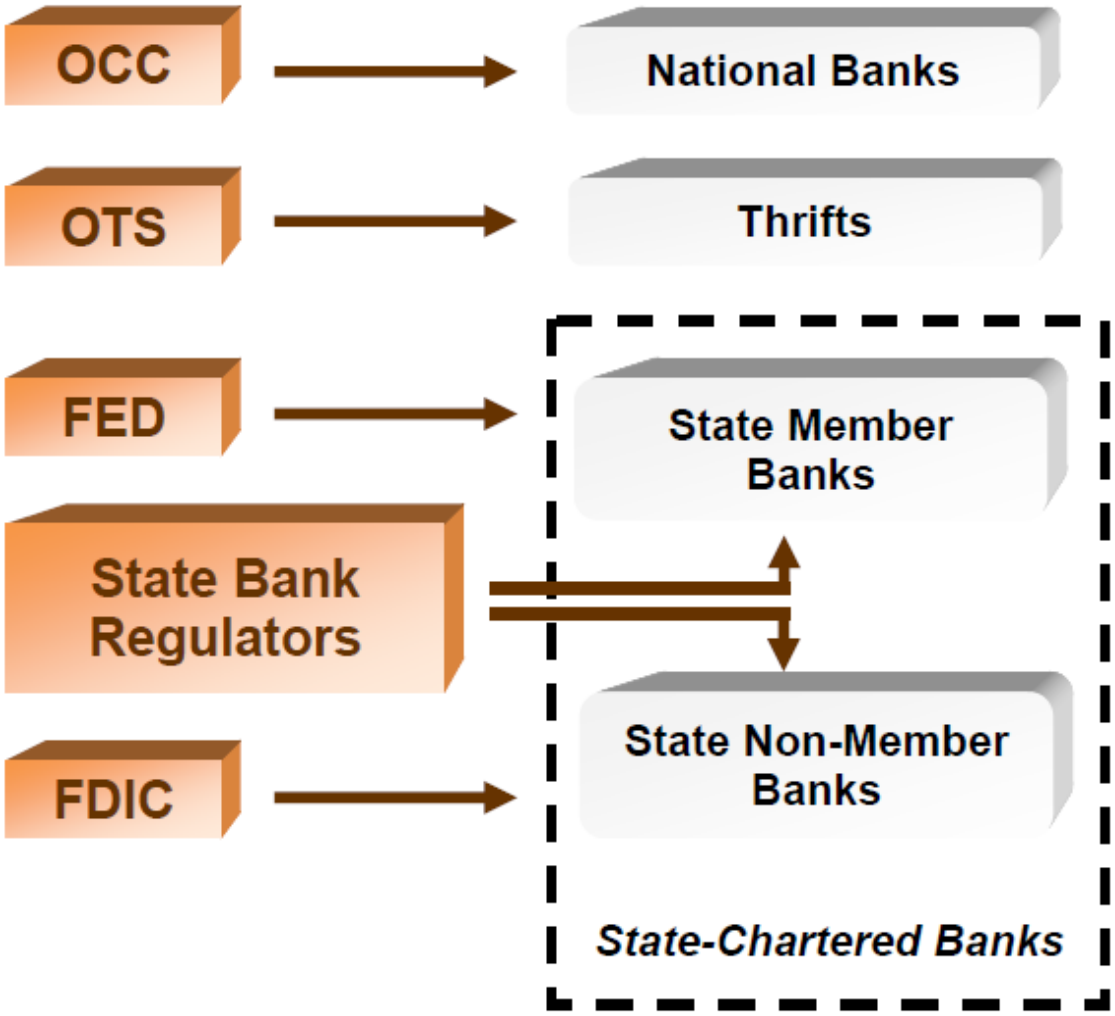
Panel A: CAMELS of All Regulators

	(1)	(2)	(3)	(4)
	Combined CAMELS	**Combined CAMELS**	**Combined CAMELS**	**Combined CAMELS**
FRB	0.188***	0.190***	0.107***	0.103***
	[0.021]	[0.021]	[0.015]	[0.014]
FDIC	0.108***	0.101***	0.071***	0.065***
	[0.017]	[0.017]	[0.010]	[0.010]
OCC	0.130***	0.135***	-0.012	-0.029
	[0.025]	[0.026]	[0.143]	[0.143]
OTS	0.165***	0.161***	-0.153	-0.150
	[0.023]	[0.024]	[0.149]	[0.142]
Other Controls	Yes	Yes	Yes	Yes
Fixed effects			Bank	Bank
		Quarter		Quarter
Observations	435886	435886	435886	435886
Adjusted R-squared	0.313	0.324	0.612	0.624
# of banks	11628	11628	11628	11628
# of clusters	50	50	50	50

Panel B: Bank Entry and Regulator Differences

	(1)	(2)
	Combined CAMELS	**Combined CAMELS**
Federal Agency	0.078***	0.089***
	[0.017]	[0.013]
Federal Agency * SMB/NMB Entry	0.016**	0.021*
	[0.006]	[0.011]
Federal Agency * # SMB/NMB		-0.000
		[0.000]
Observations	45102	45102
Adjusted R-squared	0.474	0.474
# of banks	6626	6626
# of clusters	50	50

Figure 1: Regulatory Structure for US Commercial Banks and thrifts 1996:Q1-2011:Q1



. **Figure 2: Supervisory Spells and Timing**

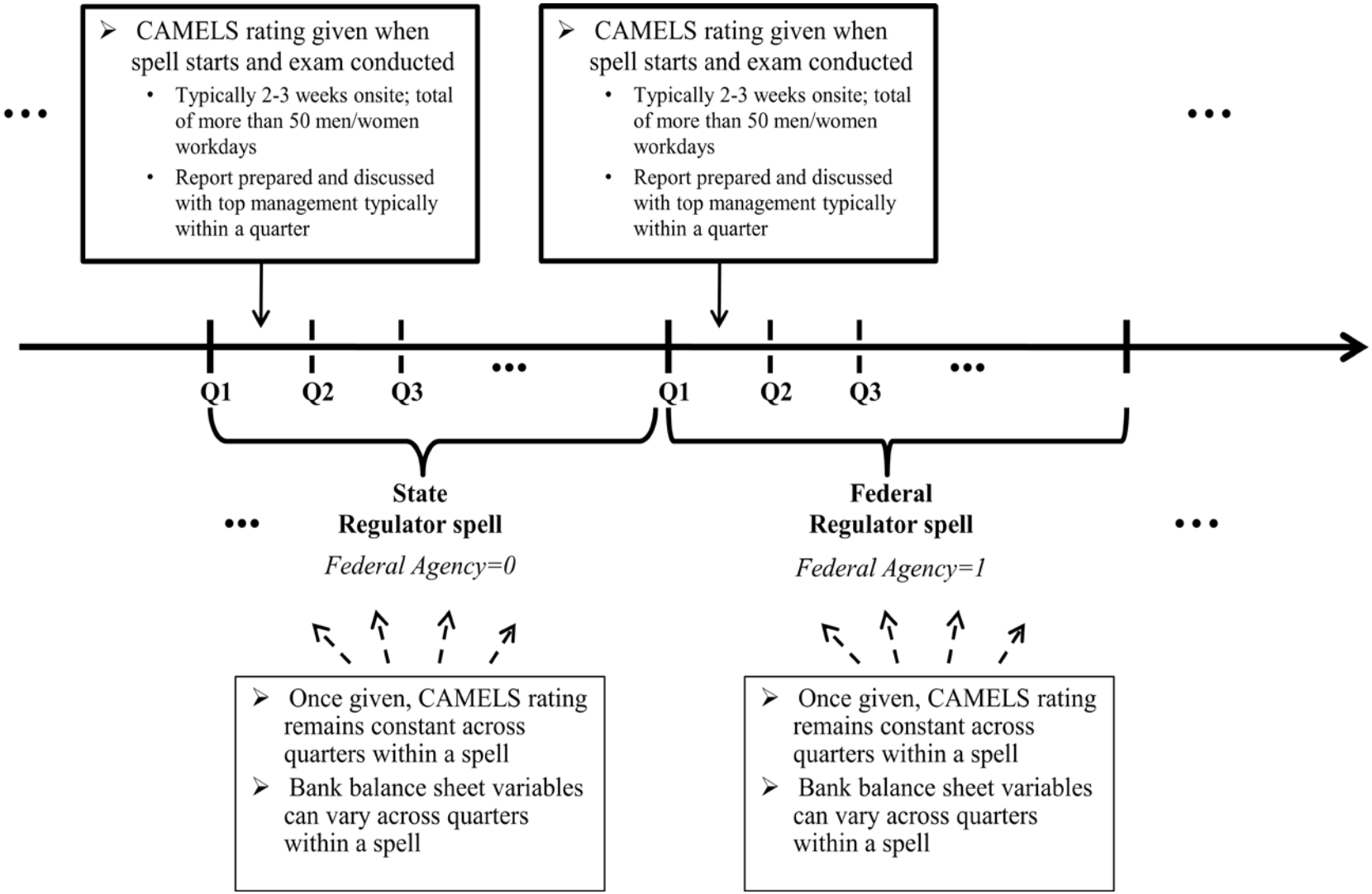


Figure 3: Distribution of Regulator Spells for SMBs and NMBs

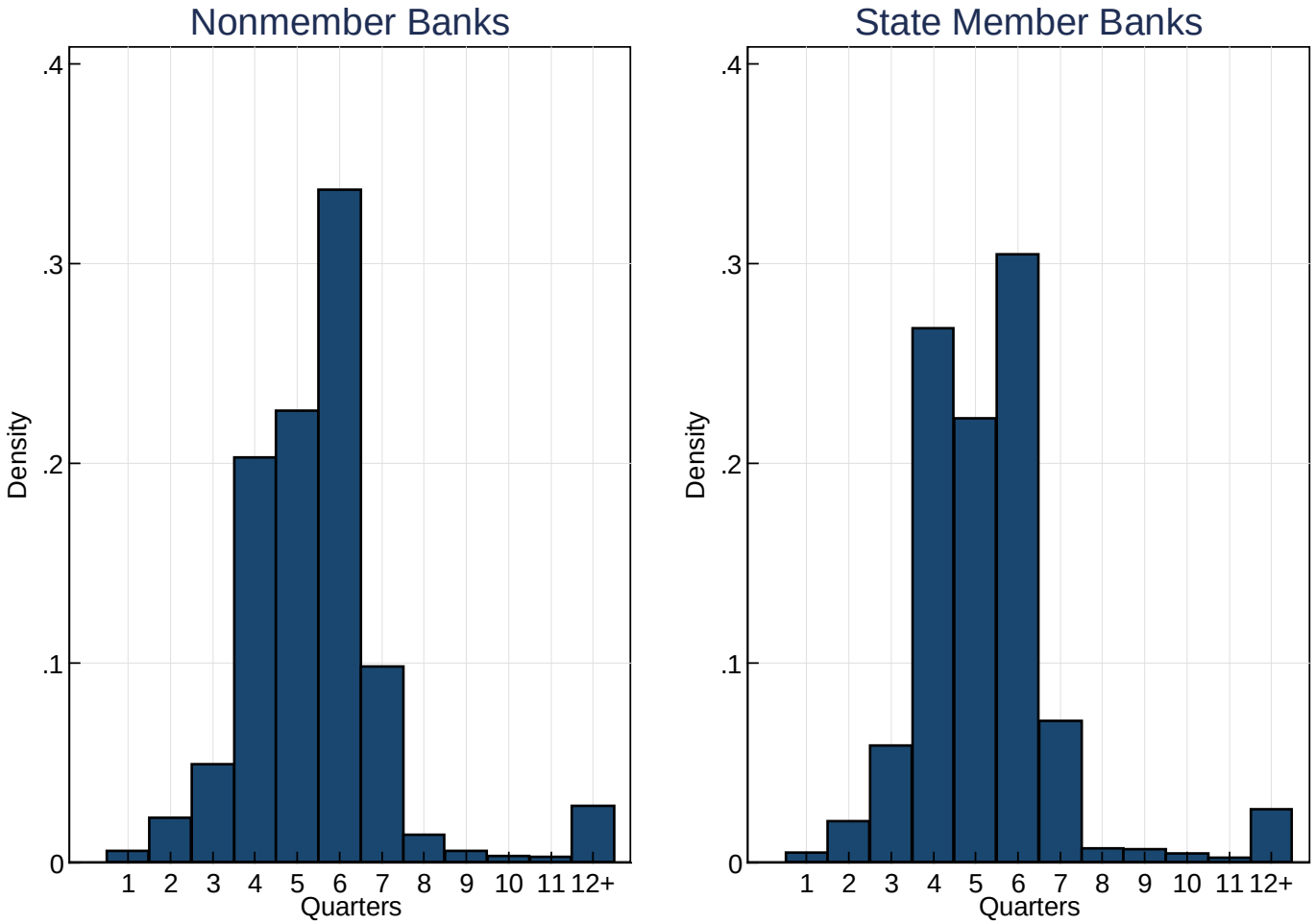


Figure 4: Average Evolution of CAMELS within a Bank

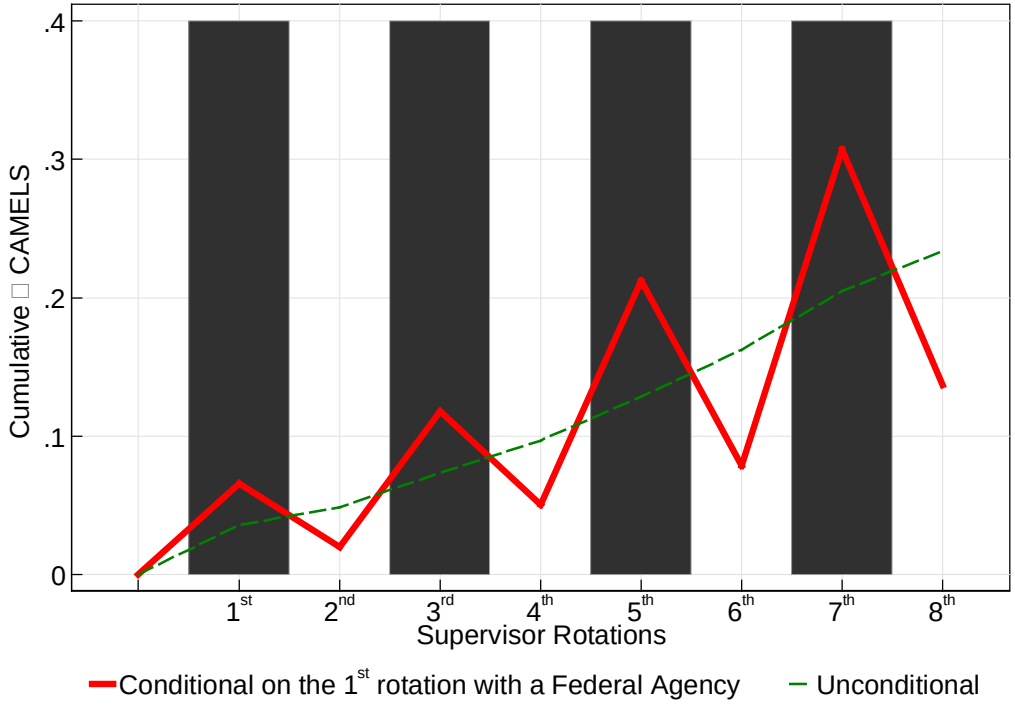


Figure 5: Federal and State CAMELS Spread across States