Disclosure Regulation in the Commercial Banking Industry: Lessons from the National Banking Era.[*]

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January 16th, 2013

Abstract

I exploit temporal and spatial variation in the adoption of disclosure regulation across the state banking systems of the National Banking era to examine how these regulations affect the development and stability of commercial banks. I find strong evidence that requirements to report financial statements in local newspapers promoted the stability and development of the state banking system, but little evidence that periodic on-site examinations incrementally contributed to these outcomes. These results suggest disclosure regulation mitigates agency conflicts between bankers and depositors by facilitating private monitoring. I also analyze the political economy of disclosure regulation using evidence from the popular votes on the 1888 Illinois and Michigan referenda. Counties in which large agricultural landowners and private banks were particularly strong were less likely to vote favorably for the enactment of these laws. These findings suggest incumbent groups oppose laws that promote disclosure and monitoring, because their passage would foster financial development and threaten their private interests.

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1 Introduction

Does disclosure regulation promote the stability and development of the commercial banking industry? Recent regulatory efforts to improve disclosure standards in banking have reignited the debate over this question. Yet the motives and consequences of disclosure regulation in the banking sector remain largely unexplored (Leuz and Wysocki, 2008). A potential reason lies in the challenges that researchers face to uncover persuasive empirical evidence on this topic. For example, small innovations in individual disclosure standards of modern banking systems are unlikely to yield economic effects that could be substantiated empirically. Conversely, while large regulatory events (e.g., Sarbanes-Oxley Act, Dodd-Frank Act) do not pose similar obstacles, they lack the temporal and spatial variation that researchers need to effectively distinguish the effects of disclosure regulation from those of other macroeconomic and regulatory shocks.

I use a quasi-natural experiment to identify the impact of disclosure regulation in banking. From the beginning of the National Banking era in 1863 until the implementation of the Federal Reserve system in 1914, several U.S. state regulators adopted laws requiring state-regulated banks to publish reports of financial condition in local newspapers and requiring state examiners to conduct periodic on-site supervisions of state banks. In addition, the architecture of the banking system facilitated the coexistence of state-regulated banks with national banks, that were not directly subject to state regulations.

This setting goes a long way toward addressing the empirical challenges mentioned above. First, these rules triggered a large switch from a regime with no disclosure requirements to a regime that required publication of basic financial information that depositors could use to monitor the liquidity and solvency of the bank. Second, the extensive variation in the adoption dates of these regulations within a political and economic union – the U.S. state economies of late nineteenth and early twentieth centuries – eases concerns that concurrent macroeconomic events explain the results. Finally, the coexistence between state-regulated and national-regulated banks allows me to benchmark the evolution of state banks with that of national banks that were subject to the same regional shocks, but were not affected directly by state disclosure regulation.

The need to empirically assess the role of disclosure regulation stems, in part, from the inconclusiveness of the theoretical debate.[1] The arguments in favor of disclosure rules stress that they bind bankers to disclose credible financial information to the public. In turn, information allows depositors to gauge the risk profile of banks' portfolios with greater precision, thereby disciplining bankers to avoid diverting resources or taking excessive risks. Otherwise, depositors "vote with their feet" or price protect by demanding a

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[1]Goldstein and Sapra (2011) recently review the theoretical arguments in favor of and against public disclosure of information in the financial industry.

higher deposit rate on their contracts (Jensen and Meckling, 1976; La Porta, Lopez-de Silanes, and Shleifer, 2006). Dewatripont and Tirole (1994) further suggest disclosure regulation attenuates free-rider problems among the large number of small unsophisticated depositors who cannot coordinate their monitoring efforts. In short, the proponents of regulation see it as an innovation that mitigates agency problems between bankers and depositors, thereby reducing the threat of expropriation, enhancing depositors' confidence in the banking system, and raising stability and competition in banking markets.

By contrast, recent studies suggest disclosure regulation could destabilize a banking sector. In Morris and Shin (2002), information disclosure – especially if it is imprecise – could raise the likelihood of bank runs, because public information is not only informative about the bank's financial condition, but also of other depositors' actions. As a result, depositors put greater than optimal weight on public information, which could trigger inefficient bank runs.[2] Gigler, Kanodia, Sapra, and Venugopalan (2012) model a second-best environment in which more public disclosure could distort investment decisions when investors face price pressures. In addition, a vast literature going back to Coase (1960) argues that one-size-fits-all disclosure standards are inefficient because commercial bankers could privately contract their own disclosure arrangements. Reporting requirements and especially public on-site supervision also entail government intervention, thereby raising concerns about distortions and corruption stemming from regulatory capture (e.g. Stigler, 1971; Leftwich, 1980; Kane, 1989).

My findings suggest disclosure rules contributed to the stability and development of these banking systems. Specifically, the yearly failure rate of the banking systems at the state level – a measure of banking stability – dropped relative to its pre-regulatory level in states adopting these rules. The evolution of aggregate balance-sheet ratios also suggests state banks were safer after the implementation of disclosure requirements: the capital ratios of state banks dropped about three percentage points, deposit rates of state banks converged toward those of national banks, and depositors in state banks substituted short-term demand deposits for long-term deposits. The empirical analysis also indicates reporting requirements favorably affected the total number of banks per capita in the state and the average interest rate on loans – two measures of financial development during that period. The positive effect on financial development is consistent with Rajan and Zingales (2003b) and Leuz and Wysocki (2008), who argue disclosure regulation facilitates entry and competition by enhancing the credibility of potential entrants and reducing the importance of reputation and established connections in local banking markets. Interestingly, periodic

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[2]Cannon (1910); Gorton and Mullineaux (1987); and Kroszner (1999) describe how, during episodes of crisis, city clearinghouses suppressed disclosure of its members' individual financial information and acted like a single firm by providing aggregate information of the clearinghouse itself. This mechanism offers a vivid demonstration that 19th-century bankers worried about the potential destabilizing effects of disclosing public information.

on-site examinations of state banks did not incrementally contribute to the stability and development of these systems. Despite the benefits of public supervision posited in Dewatripont and Tirole (1994), the higher likelihood of regulatory capture stemming from repeated interactions between government officials and commercial bankers could explain this result.

These results are subject to several caveats. First, state lawmakers often passed disclosure requirements in conjunction with other banking regulations. As a result, I must address a potential correlated omitted variables problem because tracking and controlling for every change in banking regulation is not feasible. Double liability provisions – which extended the liability of shareholders from the amount of their initial investment to an additional amount up to par value of the shares owned – are a good proxy for other regulatory initiatives that could bias the results because regulators adopted double liability more often than other regulations such as capital and reserve requirements (e.g., Grossman, 2001). Hence, in robustness analysis, I gauge the sensitivity of the empirical results to the introduction of double liability provisions. Second, cross-sectional and temporal variation in the adoption of disclosure regulation could stem from local shocks to economic conditions that have different effects on the two types of banking systems. Under these conditions, the evolution of national banks becomes an inadequate counterfactual for the evolution of state banks in the absence of regulation and, as a result, the estimator does not isolate the effect of regulation. A specific concern stems from the lower restrictions that state banks faced to make loans. National banks could not extend real estate loans, whereas state banks were generally allowed to do so – within certain concentration limits. Thus systematic shocks to the value of real estate loans that simultaneously influence regulators' decisions to pass disclosure regulation could distort the results. To deal with these issues, I test the sensitivity of the analysis to the inclusion of variables proxying for the proportion of real estate loans held in each banking system.

Disclosure regulation results from political processes, whereby actors with different incentives interact and form coalitions to advance their own interests (Stigler, 1971; Watts and Zimmerman, 1978). To understand the motives behind the introduction of these statutes using insights from the private interests literature (Stigler, 1971; Peltzman, 1976), I examine whether some classes of incumbents influenced the adoption of disclosure regulation (Leuz and Oberholzer-Gee, 2006; Leuz and Wysocki, 2008).

I examine the county-by-county voting patterns in the 1888 popular vote of the banking laws in Illinois and Michigan to understand which political and economic forces influenced the passage of these laws. In 1887, the legislatures of both states approved banking laws creating a state banking supervisory authority that was required to periodically inspect state banks. In a study of another popular vote decision on the Illinois banking law, White (1985) argues that private interest groups campaigned to persuade voters to

side with them. Thus, I interpret the county outcomes of this popular vote as a microcosm to study the interplay of forces that determined the approval of this type of legislation in other regions and periods.

Following Rajan and Ramcharan (2011b) and Rajan and Zingales (2003a), I analyze whether the strength of agricultural elites and incumbent financiers explains cross-county variation in voting patterns. Low levels of financial development meant large landowners with loanable surpluses had market power over small farmers who had no other sources of credit (Rajan and Ramcharan, 2011b). Thus agricultural elites had incentives to oppose disclosure regulation that promoted financial development and facilitated small farmers' access to finance. The empirical findings suggest counties with greater inequality in agricultural land size distribution were more likely to vote against the legislation. Consistent with studies documenting the opposition of small banks to regulation that promotes financial development (Kroszner and Strahan, 1999; Rajan and Ramcharan, 2011a), I also find that counties primarily served by small private banks were less likely to vote for these laws.

Understanding why some U.S. states adopted reporting requirement more than half a century later than others is puzzling in light of the empirical findings suggesting a positive influence of disclosure regulation. A possible rationale is that powerful political interests opposed regulation that potentially benefited local banking systems. Therefore, states with powerful and well-organized large landowners and small banks were less likely to adopt disclosure regulation early, even when their effects were predictably positive for local banking systems. By contrast, when private bankers and agricultural elites were not well-organized, regulators could pass disclosure regulation even when their effects were not as significant. I assess whether the effects of disclosure regulation varied with the strength of large landowners and private bankers and I find empirical evidence suggesting that when disclosure regulation is passed in states with high prevalence of private interests, its effects are significantly larger.

This study makes several contributions. First, Leuz and Wysocki (2008) claim the link between disclosure regulation and financial development remains largely unexplored.[3] Barth, Caprio, and Levine (2004) use a cross-country survey of bank regulatory practices to probe the merits of private monitoring and public supervision in preventing bank failures and promoting financial development. The authors find that private monitoring fosters stability and development, whereas empowering public supervisors might not achieve these outcomes. However, the authors acknowledge that potential simultaneity bias limits the persuasiveness of the empirical evidence. My findings reinforce those of Barth et al. (2004) in a new hand-collected panel dataset and setting that provides better identification of the main effects.

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[3]Various studies (Ahmed, Takeda, and Thomas, 1999; Beatty and Liao, 2011; Bushman and Williams, 2012) investigate the relation between the properties of accounting systems and the operating performance of commercial banks but do not directly test their implications for financial development and growth.

Second, I provide evidence on the effects of mandatory disclosure regulation on firms' behavior. Prior studies (e.g., Jin and Leslie, 2003) show that disclosure regulation mandating publication of standardized product-quality information influences firms' choices of product quality. My paper provides evidence[4] that mandatory disclosure regulation promoting financial accounting transparency have impacts that go beyond the well-studied capital market effects: a primitive form of disclosure regulation can affect real economic outcomes of the banking sector such as its failure rate, the composition of the maturity structure of banking deposits, and the competitive environment in banking markets.

Finally, this study enhances our understanding of the regulatory process of disclosure and monitoring regulation. In particular, I investigate a unique historical setting in which the decision to implement a disclosure and supervisory system was left to the popular vote. I exploit this setting to shed light on the interplay of political and economic forces influencing the passage of these regulations. In this sense, I add to the related literature on the political economy of accounting standards (Watts and Zimmerman, 1978; Ramanna, 2008), by studying the motives underlying the adoption of mandatory disclosure rules.

The study is organized as follows. Section two provides institutional details on the banking systems of the national banking era and develops the hypotheses. Section three details the data. Section four sketches the empirical framework used in the paper. The empirical results on the effect of disclosure regulation in the stability and development of the banking systems are contained in Section five. In Section six, I delineate the political economy analysis of disclosure regulation and report its results. Section seven presents results on cross-sectional differences across states with different prevalences of special interests and Section eight concludes.

2   Institutional setting, conceptual framework and empirical hypotheses.

Three different banking systems operated concurrently in the U.S. state economies of the late 19th and early 20th-centuries. National banks were chartered by federal authorities and since inception were subject to a tight system of regulation and oversight enforced by federal regulators. State banks operated under a charter granted by state banking authorities. Some state regulators did not initially impose reporting requirements and periodic on-site examinations on these institutions, but with the passage of time, state authorities recognized the need to revise the banking laws of the pre-Civil War period. As figures 1 and 2 illustrate, by the time the Federal Reserve system was created in 1914, all state legislatures had implemented reporting requirements and nearly all had adopted periodic on-site examinations statutes,

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[4]A recent study by Jayaraman and Kothari (2012) also offers evidence that mandatory shifts in accounting standards that promote corporate transparency influences real outcomes of the banking sector.

the exceptions being Kentucky, Mississippi, and New Hampshire. Federal and state-chartered banks also competed with "private" unincorporated banks that consisted of small unregulated proprietorships whose main business was to furnish credit in rural areas.

Historical accounts suggest reporting requirements bolstered the confidence of depositors in the banking system. Barnett and Cooke (1911) considered these regulations as crucial to the good standing and trustworthiness of banks in the eyes of their community. Banking magazines (e.g. The Bankers' Magazine and Statistical Register, 1878) and official reports (e.g., Report of Study Commission for Indiana Financial Institutions) also suggest that reporting requirements were an important safeguard of the system. In this study, I empirically analyze the effect of two important components of the disclosure and public supervision frameworks: the mandatory publication of banks' financial statements in local newspapers and the periodic on-site supervision of state banks by public examiners.

The adoption of reporting requirements contributed to the safety of the banking system through at least two channels. First, these rules improved the ex-ante transparency of financial institutions and facilitated the comparison of financial statements across banks, allowing depositors to gauge with greater precision the liquidity and solvency of commercial banks.[5] In turn, greater scrutiny precluded bankers from taking unduly risky actions that endanger depositors' wealth. An excerpt from the report of the Indiana commission epitomizes this idea: "Informed public opinion is irresistible. When banks are forced to inform the public regularly as to the amounts of their questionable assets..., no longer will they dare abuse sound principles." Second, reporting requirements clarified the liability standards associated with the manipulation of financial statements, enhancing the ex-post accountability of bank officers and directors. The requirements to approve banks' periodic reports of condition made bank directors liable for material misrepresentation of the banks' true financial condition and consequently increased incentives for board members to monitor the activities of executive directors.[6]

On the other hand, Morris and Shin (2002) suggest requirements to publicly report information could induce panic-based runs that destabilize banking systems. Because financial statements do not only convey information on fundamentals but also on the actions of other depositors, agents tend to overreact to public financial reports. The inability of depositors to coordinate their actions leads them to overweight public signals due to their strategic value, exacerbating their reaction to public information.[7] Thus publication

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[5] The July 1878 edition of the Bankers' Magazine contains an article tutoring depositors on how to read financial statements to extract information about their bank's financial condition.

[6] As an example, the January 1881 edition of the Bankers' Magazine cites the case of *Trustees v Bossieux*, where the board of directors was found liable for the defalcation in the bank, because of their continued negligence "to know the true condition of affairs", while "they publish favorable annual reports."

[7] Hertzberg, Liberti, and Paravisini (2010) offer empirical evidence of this mechanism by showing that due to strategic complementarities in agents' actions, public information amplifies the effects of a news shock relative to private information.

of financial reports in local newspapers could induce panic-based runs in banks whose financial condition would not generate a run had the financial information remained private. Gigler et al. (2012) suggest information disclosure could result in inefficient investment choices because it could exacerbate managerial short-termist incentives.

Reporting requirements were primarily enforced through the threat of private litigation. According to several contemporaneous sources, officers and directors of the bank were "liable for damages to any one dealing with the corporation relying on the truth of such statements."[8] State regulators – either a specialized state banking authority or the state auditor/comptroller – also enforced compliance with the rules. Yet according to a June 1897 article in the Bankers' Magazine, their powers varied considerably across state lines. Finally, independent private audits of banks' financial reports were rare, albeit increasingly frequent by the end of the sample period. However, the effectiveness of these audits as an enforcement mechanism in unclear. The auditing profession was taking its first steps, and according to Wootton and Wolk (1992), the Federal Reserve System did not issue the first proposal for a uniform set of auditing procedures until 1918. In addition, the liability standards of auditors were not well defined throughout the entire sample period.

A potential concern is that under a standard set of assumptions, banks have incentives to voluntarily disclose their private information to alleviate information asymmetries between them and depositors (e.g., Grossman and Hart, 1980; Grossman, 1981). Hence, reporting requirements did not necessarily imply more information disclosure in the adopting states. Because of data limitations, assessing how widespread voluntary disclosures were in the pre-regulatory period would be extremely difficult. Yet regardless of the pervasiveness of voluntary statements, there is reason to believe reporting requirements have implications beyond those of voluntary disclosures. First, voluntary disclosures do not bind bankers to disclose information to depositors. In a voluntary disclosure regime, bankers cannot credibly promise to disclose in the future if disclosure is not their preferred action later. As Mahoney (1995) suggests, disclosure rules are an effective low-cost mechanism to credibly assure depositors that information will be available in the future. Second, these statutes contained clauses requiring bankers to take an oath that their financial reports were truthful. Violations would be punished as perjury. Hence these rules provided access to criminal sanctions that were not available under private contracting, thereby discouraging false statements of condition.[9] Finally, disclosure regulation could also solve a costly coordination problem among state banks, which

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[8]Excerpt taken from the replies to law and banking questions section of the January 1902 edition of the Bankers' Magazine.

[9]A chronicle written for the Bankers' Magazine provides evidence that contemporary observers were well aware of this issue: "voluntary statements or reports published without any legal obligation would be of no permanent advantage because they are without sanction...The law does not require them [voluntary statements] to be made and therefore it does not require them to be true; if false, there is no penalty and if made under oath there would be no perjury."

would struggle to negotiate and agree on a single set of comparable standards for the financial reports.[10] Standardization of financial reports enhances comparability and, as a result, should improve bank monitoring by lowering the costs of distinguishing "unhealthy" from "healthy" banks. In any case, pervasive and credible voluntary disclosures in the pre-regulatory period should increase the difficulty of finding a statistically significant association between regulatory events and outcome variables.

State legislators passed mandatory periodic on-site examinations for state banks at the same time as or after the introduction of reporting requirements – with the exception of the state of Georgia. These statutes represent a switch to a regime that puts more emphasis on public supervision to complement reporting requirements. Under this regime, state regulators implement a microprudential structure to periodically inspect every state bank and secure finer information about its financial condition. Regular on-site examinations thus result in additional power to elicit relevant information from state commercial bankers that could be used to provide delegated monitoring services to a large number of unsophisticated depositors. The public provision of monitoring services could solve the free-rider problem among depositors and contribute to a more stable and developed system.

Nevertheless, periodic on-site supervisions entail drawbacks. Stigler (1971) and Peltzman (1976) point out that regulators do not always defend the best interest of society and that the regulatory process can engender more resource misallocation than that generated by an unregulated economy. Kane (1989) provides a vivid example of how regulators were captured during the savings & loans crisis and amplified an already negative downturn in the economy.

The arguments of the preceding paragraphs preview the main tension in the study. Reporting requirements and periodic on-site examination could be innovations that reduce agency problems between bankers and depositors, reducing the threat of expropriation, limiting excessive risk-taking, raising depositors' confidence in the system, and promoting competition in banking markets. Yet, regulatory innovations could destabilize markets and create the opportunity for pernicious interactions between incumbents and regulators. The partial equilibrium analysis developed in this study sheds light on some effects of these regulations. Thus, the study informs the debate about the economic trade-offs underlying disclosure regulation in the banking industry and contributes to a better understanding of the circumstances under which these regulatory actions are desirable from a policy point of view.

In what follows, I detail how disclosure regulation could affect the specific outcome variables that I use to evaluate the evolution of the stability and development in the banking systems.

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[10]When state banking laws did not explicitly address this issue, the decision on what to report was left to the bank regulators.

2.1 The impact of regulation on banking stability.

One of the main premises underlying the analysis is that disclosure regulation reduces the threat of resource diversion and excessive risk-taking. Ideally, I would use measures of the total amount of resources diverted by bankers and of the risk of the asset portfolio of banks to empirically test this hypothesis. However, data limitations restrict the analysis to assessing the impact of disclosure regulation on the failure rate of financial institutions. The use of the failure rate variable entails the implicit assumption that the reduction in failure rates stems from a reduction in failures and suspensions due to mismanagement or excessive risk-taking.

Hypothesis 1: Banking systems that adopt mandatory reporting and supervisory examinations requirements experience lower failure rates after the adoption of these statutes.

Reporting requirements should lower the costs of information acquisition for depositors and thereby raise monitoring intensity. In turn, more monitoring should increase the probability of early detection and, in equilibrium, reduce bankers' incentives to engage in delinquent behavior (e.g., Becker, 1968). In addition, by lowering the costs for an individual depositor to monitor the bank and allowing government officials to periodically provide delegated monitoring services, reporting requirements and periodic on-site examinations could also mitigate costly free-riding.

Yet, disclosure regulation can be detrimental to financial stability. The recent literature on global games, (Morris and Shin, 2002) suggests disclosure of noisy public information might increase the likelihood of bank runs. Thus, public information potentially aggravates the coordination problem among depositors, whose incentives to run on the bank are influenced by their expectations of how other depositors will act. Cordella and Yeyati (1998) suggest that when banks have limited control over their asset portfolios, disclosure has little influence on risk management, but allows depositors to readjust their required deposit rates to the risk fluctuations of banks' assets. Hence disclosure requirements destroy inter-temporal risk-sharing opportunities and could raise the aggregate failure rate of the system. Finally, Kane (1989) reminds us how regulatory capture can exacerbate a banking crisis and result in higher failure rates.

2.2 Impact on Balance-Sheet Composition and Depositors' Confidence.

In the previous subsection, I hypothesize that disclosure regulation enhances banking stability by facilitating private monitoring. If the banking system becomes safer with the adoption of disclosure regulation, other balance-sheet ratios and equilibrium prices should behave as if the perceived level of depositor protection in the banking system increased.

Hypothesis 2: The adoption of reporting requirements and periodic examinations substitutes other safeguards for managerial malfeasance and bank failure.

To test this hypothesis, I examine the impact of disclosure regulation on (1) the aggregate equity capital ratios of the banking systems, (2) the maturity structure of deposits in the banking system, and (3) the equilibrium interest rate in the deposit markets. The main premise is that disclosure regulation was a low-cost regulatory innovation that improved the overall level of deposit protection in the market, thereby allowing commercial banks to scale back on alternative mechanisms to protect depositors.

In the absence of deposit insurance, equity capital was the main safeguard of depositors against losses in banks' assets portfolios. Thus, in equilibrium, bankers tend to hold more equity capital when agency and adverse selection problems are more severe. Holmstrom and Tirole (1997), suggest incentives to exert costly and unobservable monitoring efforts decrease as the percentage of deposits financed by uninformed depositors increases. Hence depositors rationally require bankers to raise their equity stake to elicit effective monitoring. In Gertler and Kiyotaki (2010), bankers have the option to divert a fraction of the assets under their control. To avoid this outcome, the value of the banks' equity held by insiders must be kept above the potential net proceeds from diversion. Disclosure regulation mitigates agency issues and, as a result, lower the incentive-compatible level of equity required from banks.

Disclosure regulation should also affect the deposit maturity in the banking system. Calomiris and Kahn (1991) and Diamond and Rajan (2001) explain the demand-deposit contract as a mechanism that allows bankers to commit against the possibility of diversion activities. The demand-deposit is effective in preventing expropriation, because the sequential service constraint built into the demand-deposit contract prevents any possible renegotiation between banks and depositors. The destruction of value stemming from bank runs reduces the spoils that bankers can collect from a diversion strategy, reducing their incentives to divert. To that extent, the demand-deposit contract effectively reduces agency costs, at the expense of some strategic fragility that occasionally results in destructive bank runs. Disclosure regulation reduces the threat of diversion and, consequently, alleviates the need to use a high proportion of short-term demand-deposits.[11] Longer deposit maturities are also consistent with an increase in households' trust in the banking systems (Guiso, Sapienza, and Zingales, 2004). Households respond to improvements in legal enforcement and lower threat of embezzlement, by adjusting their investment portfolio toward contracts whose characteristics require greater trust in financial institutions. Thus the effect of disclosure regulation on the trust in financial systems can also explain a change in maturity structure of banks' deposits.[12]

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[11] Demand-deposit contracts imply immediate payment at the depositor's request.

[12] The model of Guiso et al. (2004) is primarily oriented to study the role of social capital in financial development. Nevertheless, the authors also derive results relating the role of legal enforcement to households' supply of capital.

Finally, reporting requirements and periodic examinations reduce agency conflicts between depositors and bankers and consequently, the need to compensate these risks in the deposit market. This prediction bears a resemblance to those of other accounting studies that uncover a relation between disclosure and reductions in the cost of debt (Sengupta, 1998; Ball, Hail, and Vasvari, 2009). Alternatively, disclosure regulation could have also reduced the informational and financial frictions that dampened capital mobility in the US interregional capital markets (Eichengreen, 1984). To that extent, the adoption of disclosure requirements results in a convergence in the prices of capital across banking systems, which would also be consistent with the above prediction.

Alternative hypotheses to the above predictions are possible. For instance, reporting requirements could be strategic complements with equity capital ratios, thereby forcing commercial bankers to raise their equity ratios. If more public information empowers depositors to demand more protection in the form of increases in equity capital ratios, capital ratios and disclosure regulation could be positively correlated. Another example comes from Shleifer and Wolfenzon (2002), who propose a model in which an increase in the probability of detection of managerial malfeasance could result in an upward shift in demand for deposits that is met by an increase in the equilibrium deposit rate. Therefore, the overall effect of disclosure regulation on these variables is unclear and ultimately an empirical question.

2.3   Impact on Market Structure and Access to Credit.

Promoting financial development in an environment with poor disclosure and enforcement standards is difficult. In an opaque environment, depositors will trust their savings only to reputed banks with whom they have established a prior relationship. Moreover, because depositors have no information concerning the character of new commercial bankers, they demand compensation for the greater uncertainty that trusting the new banker entails. However, in the spirit of Stiglitz and Weiss (1981), this mechanism exacerbates the adverse selection by keeping honest commercial bankers out of the market and limiting the pool of potential entrants to "dubious bankers" who seek to extract an immediate gain by engaging in fraudulent activities. The information asymmetry between depositors and bankers raises barriers to entry because it limits the set of potential entrants to people of good standing in each respective local community. Incumbent financiers exploit this market power to ration the supply of loans in the market and extract abnormal rents.

The introduction of mandatory disclosure requirements and supervisory examinations levels the playing field between incumbent financiers and potential entrants. With a well-defined and impartial legal infrastructure, depositors will no longer be held hostage by the established reputation of the incumbent

financiers and will be able to scrutinize the financial condition of new entrants and securely switch their savings to more efficient bankers offering better compensation for savings. In turn, competition will flourish, and access to credit will be less restrained. The following hypothesis is based on Rajan and Zingales (2003a,b), who stress the role of disclosure regulation as a pre-requisite for financial development because the failure to adopt an accounting and disclosure system that promotes transparency significantly reduces potential entry of new firms and financial intermediaries.

Hypothesis 3: The adoption of reporting and examination requirements improves financial development and access to credit in adopting states.

Rajan and Zingales (2003a) define financial development as the "...ease with which any entrepreneur or company with a sound project can obtain finance and the confidence with which investors expect an adequate return.". This concept is difficult to measure. I follow Rajan and Ramcharan (2011b), who use the total number of banks per capita and the average loan rates in the market as proxies for financial development and access to credit, respectively. The total number of banks per capita is a meaningful measure of financial development, especially during a period in which distance was an important factor in economic activity and the policy debates concerning access to credit generally revolved around the geographic proximity of banks. The average loan rate practiced by the regional banking systems is a proxy for the cost of credit. A lower cost of credit is plausibly associated with greater competition in the banking markets and wider access of credit to "entrepreneurs and companies with sound projects."

Nonetheless, the requirement to publish periodic reports of financial condition could have raised the fixed and operating costs of operating a commercial banks, hence reducing profitability and entry into local banking markets. Furthermore, state banking regulators could have been systematically captured by incumbent bankers who exert pressure to limit competition, thereby hurting the financial development and access to credit in the state. Thus, these questions must ultimately be addressed empirically.

3 Data and Summary Statistics

3.1 Adoption of the Disclosure and Monitoring Regulations.

I collect the years of adoption of reporting requirements and periodic on-site examinations in each state from Barnett and Cooke (1911). To confirm the validity of this information, I tracked every state legislative act introducing these regulations. In the majority of cases, the dates coincided with those provided in

Barnett and Cooke (1911).[13] Table 1 summarizes the dates of introduction and implementation of these regulations, and figures 1 and 2 graphically illustrate these adoption dates. The use of this data source entails some caveats. As discussed in Barnett and Cooke (1911), the passage of these legislative acts does not necessarily coincide with their implementation and enforcement.[14]Yet, I expect the measurement bias to work against the possibility of finding a significant result, because a banking system is categorized as subject to disclosure and periodic supervision requirements when in fact no change took place.

Substantial heterogeneity exists in the content of the legislative acts implementing these provisions. The state acts differed in terms of the periodicity of reporting and examination requirements, penalties on infractors, and compensation of state examiners, among other implementation issues. Some legislative acts also introduced or altered other banking regulations such as minimum capital and reserve requirements. Barnett and Cooke (1911) claim the state regulators introducing minimum capital requirements[15] for state banks ensured that the new capital limits were not binding for any existing state bank. Therefore, I would not expect my results to be biased in any significant way by the concurrent introduction of capital and reserve requirements in some states. In any case, I view the introduction of disclosure regulation as the first-order effect associated with the passage of most of these laws.

3.2   Measures of Financial Stability and Development.

To assess the impact of these regulations on the stability of state banking systems, I hand-collected the number of bank failures at the state, year, and banking-system level from the Annual Reports of the Comptroller of the Currency. From 1892 to 1913, the Comptroller of the Currency included a table in its annual report indicating the number of failures and suspensions and the estimated assets and liabilities of the failed and suspended commercial state banks. These numbers were courtesy of the Bradstreet Magazine, a monthly periodical that specialized in offering statistics of business failures by state to its readers. Despite the Comptroller's efforts to collect statistics on state bank failures, no data are available in the reports of the Comptroller of the Currency prior to 1892.

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[13]A rare exception occurred for the state of Arizona, whose stated year of adoption in Barnett and Cooke (1911) is 1897, but no legislative act could be found for that year. Instead, I found an 1893 legislative act mandating reporting requirements and period examinations. I use 1893 as the adopting date for Arizona in the empirical analysis. Small problems also occur with the states of Illinois and Michigan. Barnett and Cooke (1911) indicate the adoption of periodic examinations dated from 1887. The statutes were indeed approved in 1887. However, in both states, the 1887 act had to be approved by a referendum, which only took place in 1888. All empirical results are robust to these empirical research choices.

[14]The case of Illinois is illustrative of this problem. The reporting requirement regulation for state banks dated back to the pre-Civil War period. However, according to contemporary sources cited in the Chicago Tribune, this requirement was not enforced until the passage of the 1888 banking law.

[15]The minimum capital requirements is the minimum level of equity capital required by regulators. The state and federal regulators of the National Banking era overwhelmingly established capital limits in terms of an absolute dollar value that varied with the population of the town where the bank was located.

The annual statewide aggregate balance-sheet data of each banking system is taken from the United States Historical Data on Bank Market Structure, 1896-1955 (ICPSR 2393 by Flood, 1998). This dataset was compiled from the All Bank Statistics, created by the Board of Governors of the Federal Reserve System with the cooperation of the State Banking Supervisory Authorities, and the Office of the Comptroller of the Currency. The All Bank Statistics data are a revised series of the principal assets and liabilities components of the National and State banking systems by year and state. The data were assembled using information from several sources, namely, the annual reports of the Comptroller of the Currency and several state regulators' reports. Hence the information contained in this dataset is arguably more reliable than that presented in the annual tables offered by the Office of the Comptroller of the Currency in its annual reports. Nevertheless, thede data entail some limitations. According to the dataset manuals, some states did not require information about some balance-sheet items in some years. In those cases, the dataset imputed the missing values by interpolating over the years when information is available. This problem is less of a concern for the equity ratio analysis, which uses broad categories of information that were always available, but poses a greater threat for the analysis using the maturity structure of deposits.

The number of banks per state is taken from Barnett and Cooke (1911), who compiled the statistical information on the number of national, state and private banks by state and year for the 1876–1909 period. The sources for these tables are the annual reports of the Comptroller of the Currency and the reports of state banking regulators. Barnett and Cooke (1911) also provide information on the number of small private banks taken from the annual editions of the Homans' Bankers Almanac and its continuations. Scant information is available regarding private banks, because of their unregulated nature. The Homans' Bankers Almanac was a bankers' directory that collected information about all types of banks, including private banks. According to Barnett and Cooke (1911), the information provided in these directories is reliable in that it closely corresponds to the official enumerations carried out by the Commissioner of Internal Revenue for the years 1880, 1881, and 1882.

I extracted the loan and deposit rate at the state, year, and banking-system level for the years 1889, 1894, and 1899 from the 1899 edition of the Annual Report of the Comptroller of the Currency. In 1899, the Comptroller of the Currency surveyed national and state banks in each state and reserve city about the rates of interest that they had set on loans and paid on deposits on three dates: July 12, 1889; July 18, 1894; and June 30, 1899. The Comptroller's 1899 Annual Report reported the average loan and deposit rates by state and reserve city for each date. This dataset is potentially subject to significant survivorship bias because only those banks that survived for more than ten years were able to report on the rates that they had practiced in 1889. But unless the bias affects the treatment and control groups differently, the

identification strategy used in the empirical analysis alleviates these concerns .

3.3 Voting and Demographic Data.

I obtain state-level demographic data from the US Census and County Data Books (Haines, 2004), complemented with data from the National Historical Geographical Information System.[16] In some specifications in which I do not control for state-year fixed effects, I control for total population in the state, which I compute by interpolating the total population numbers in the decennial census using a natural cubic spline. I also control for the percentage of population in the state living in cities of 25,000 or more using the same type of method.

I hand-collected the county-level votes on the 1888 banking popular vote and presidential elections from the records of Illinois elections returns available in microfilm at the University of Chicago's Regenstein Library. The county-level election returns for Michigan are available in the official directory and legislative manual of the state of Michigan for the years 1889–1890. To supplement the regressions in the second part of the study, I also obtained county level data from the 1890 census data taken from the same source mentioned above. Finally, I obtained counts of the number of national, state, and private banks per county in the State of Illinois and Michigan from 1887 Homans' Bankers Almanac.

3.4 Summary Statistics

Panel A of Table 2 presents summary statistics of relevant variables for state and national banking systems separately. The main takeaways from this table are that state banks seem comparable in size and number to national banks, but as I previously mentioned, different restrictions in their loan porfolios imply they hold a much larger share of their portfolio in real estate loans. These statistics validate the assessment of an editorial in the Bankers' Magazine in its February 1902 edition, which stated that "as a rule we find State banks with equal or greater capital side by side with national banks. The possession of capital does not by any means induce the starting of a national bank in preference to a state bank. The real reason of the growth of these institutions is greater power in making loans, greater freedom from restrictions that seem to personally interfere with the personal independence of the banker."

The differences-in-differences analysis in Table 2, Panel B decomposes the sample averages of the main outcome variables for each type of banking system into a pre- and post-reporting-requirements period. State laws did not affect national banks, so the sample averages for the national banks in the pre-period correspond to the set of state-years prior to the adoption of reporting requirements for state banks. The

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[16]extracted from www.nhgis.org

results generally line up with what would be expected under the hypotheses described in previous sections. The exception comes from the average deposit-rate analysis of state banks, which increases relative to that of national banks in the period after the adoption of reporting requirements. Nevertheless, the multivariate analysis shows that after I control for state and year effects, the results for the average deposit rate have the expected sign. Another unexpected empirical fact is that national banks hold a significantly larger percentage of demand-deposits both before and after the introduction of reporting requirements for state banks. In equilibrium, banking systems in which conflicts of interest are more severe should have a larger percentage of demandable deposits. A potential explanation for these findings is that commercial banks sought to match the maturity structure of their assets and liabilities. Given that state banks hold a larger percentage of assets with long maturities (e.g., real estate loans), their aggregate deposit maturity will also tend to be longer. In any case, the diff-in-diff analysis is consistent with the agency-theoretical prediction posited above.

4   Empirical Implementation

The U.S. state economies of the National Banking era are a useful laboratory in which to study disclosure regulation for various reasons. The setting entails considerable variation in the temporal and spatial implementation of reporting and periodic examination requirements within a relatively homogeneous set of political, economic, and social institutions. The availability of variation in disclosure rules within a single political unit reduces concerns that institutional differences, such as the respect for the rule of law or the level of social capital, affect the results, whereas the inter-temporal and spatial variation ensures common macroeconomic trends or market-wide shocks are not driving the results.

Nevertheless, disclosure and accounting regulation is not imposed exogenously (Watts and Zimmerman, 1978). Legislation often emerges from regulators' reactions to external conditions, such as economic shocks or political pressure from powerful lobbies. To the extent that state banks react to external conditions that prompt policymakers to adopt new regulations, the estimated coefficients could capture the effect of these concurrent events rather than the real disclosure-regulation effect. The coexistence of national and state banking systems within the same state and time period provides the possibility of controlling for state-year-specific shocks that simultaneously affect the banking outcomes and the politicians' decisions to adopt new regulations, thereby addressing this potential source of endogeneity in the results.

Suppose the outcomes of the state banking system follow a simple components-of-variance model:

$$Y_{it}^{St} = \eta_i^{St} + \gamma_t^{St} + \mu X_{it}^{St} + \beta D_{it}^{St} + \epsilon_{it} + \epsilon_{it}^{St} \tag{1}$$

where Y_{it}^{St} is the outcome of interest for the state banking system in state i and year t, η_i^{St} is the permanent component associated with state i, γ_t^{St} is a economy-wide shock associated with each period of time, X_{it}^{St} are time-varying determinants of the outcome of interest, D_{it}^{St} is an indicator variable for the adoption of reporting requirements or periodic examinations, and $\epsilon_{it} + \epsilon_{it}^{St}$ is an unobservable idiosyncratic shock to the variable of interest that can be subdivided into two orthogonal shocks: a state-year common component ϵ_{it} and a state-banking-system-specific component ϵ_{it}^{St}.

The outcomes of the national banking systems follow a similar type of model:

$$Y_{it}^{Nat} = \eta_i^{Nat} + \gamma_t^{Nat} + \alpha X_{it}^{Nat} + \epsilon_{it} + \epsilon_{it}^{Nat}$$

which includes no treatment variable because national banks were always subject to reporting and periodic examinations requirements. As such, the permanent component associated with each state η_i^{Nat} will capture the tighter regulation of national banks. All other variables are defined as in equation 1.

Under conditional independence of disclosure regulation $\left\{Y_{1it}^{St}, Y_{0it}^{St}\right\} \perp D_{it}^{St}|t, i, X_{it}^{St}$, that is, if the potential outcomes of the banking system are independent of treatment status conditioning on observables, the differences-in-differences estimator could consistently estimate the disclosure regulation effects β, and these estimates would only require data from the state banking system aggregates.

However, a more realistic approach is to consider that state regulators have their own objectives and their best incentives could be correlated with the unobserved temporary shocks $\left\{\epsilon_{it}, \epsilon_{it}^{St}\right\}$ in the state economy. Suppose the banking regulators in state i and period t enact new disclosure regulation if:

$$v_{it} \leq \bar{v}, \tag{2}$$

where v_{it} is a random variable, distributed with mean μ_{it}, variance σ_v, and $\bar{v}$ is a threshold value below which the policy-maker decides to enact the regulation. Note the state-year-specific mean μ_{it} may itself be conditional on observable variables such as the state's economic growth, demographics, or even the influence of incumbent groups.

Assuming linearity of the conditional expectation of the variables of interest in the selection variable v_{it},[17] the expected value of the variable of interest of the state banking system conditional on disclosure

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[17]A sufficient condition is that the variables are jointly normally distributed.

regulation is

$$E\left(Y_{it}^{St}|v_{st}\leq\bar{v}\right) = E\left(Y_{0it}^{St}\right) + \beta D_{it}^{St} + \left[cov\left(\epsilon_{it}, v_{it}\right) + cov\left(\epsilon_{it}^{St}, v_{it}\right)\right] \times \lambda^{\star}, \tag{3}$$

where $\lambda^{\star} = -\frac{E[v_{st}|v_{st}<\bar{v}]}{\sigma_v}$. Thus the expected value of the outcome variable conditional on being treated is equal to its potential outcome if it was not treated $E\left(Y_{0it}^{St}\right)$ plus the treatment effects β plus two components that reflect the covariance between the state politicians' selection variable and the idiosyncratic state-year-specific shock. The main takeaway is that the differences-in-differences estimator will capture not only the treatment effect β, but also the last term of equation (3). Thus, the estimator will be biased if the regulators' decisions are correlated with the state-year-specific shocks ϵ_{it}.

The expected value of the outcome of interest for the national banking system conditional on the adoption of regulation in the state banking system is defined as

$$E\left(Y_{it}^{Nat}|v_{it}\leq\bar{v}\right) = E\left(Y_{0it}^{Nat}\right) + \left[cov\left(\epsilon_{it}, v_{it}\right) + cov\left(\epsilon_{it}^{Nat}, v_{it}\right)\right] \times \lambda^{\star}. \tag{4}$$

Taking differences between (3) and (4) yields

$$E\left(Y_{it}^{St}|v_{it}\leq\bar{v}\right) - E\left(Y_{it}^{Nat}|v_{it}\leq\bar{v}\right) = E\left(Y_{0it}^{St} - Y_{0it}^{Nat}\right) + \beta D_{it}^{St} + \left[cov\left(\epsilon_{it}^{St}, v_{it}\right) - cov\left(\epsilon_{it}^{Nat}, v_{it}\right)\right] \times \lambda^{\star}. \tag{5}$$

By differencing the outcomes of the two systems, I neutralize the effect of the covariance between the common idiosyncratic state-year-specific shocks ϵ_{it} and the v_{it}. In simple terms, this strategy eliminates the identification threat stemming from the regulators' incentives to enact regulation in response to changes in statewide economic conditions such as a wave of non-business failures in the state or the emergence in the demand for banking services by the state manufacturing sector.

The main empirical specification in this study is a triple-differences model[18] that exploits the variation in the implementation of disclosure regulation across banking system to draw causal inference. Assuming $cov\left(\epsilon_{it}^{St}, v_{it}\right) - cov\left(\epsilon_{it}^{Nat}, v_{it}\right) = 0$, the following empirical model unbiasedly estimates β:

$$Y_{ist} = \alpha_{it} + \eta_{st} + \rho_{is} + \beta D_{ist-1} + \gamma X_{ist} + \epsilon_{ist}, \tag{6}$$

where Y_{ist} is the outcome of interest for banking system s, in state i and period t, α_{it} represents state-year fixed effects controlling for time-varying factors within each state, such as state economic growth

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[18]The triple-differences estimator is often employed in labor econometrics studies (e.g., Yelowitz, 1995)

or yearly business failures in each state, and η_{st} are banking system-year fixed effects, that control for common shocks to a banking system in a particular year. As an example, macroeconomic trends or even amendments to the regulations of each banking system would be absorbed by η_{st}. ρ_{is} represents state-banking system fixed effects that control for the invariant characteristics and rules of each banking systems in each state, X_{ist} is a vector of observable state-year-banking system characteristics that affect the outcome of interest, and D_{ist-1} is an indicator variable taking the value of one if state s enacts disclosure regulation for state banking system in period *t-1*, and zero otherwise. Finally ϵ_{ist} is a random error term. In short, identification stems from the variation in the adoption of disclosure regulation across banking systems within a particular state and year.

A close inspection of equation 5 reveals the critical assumption underlying this exercise. The empirical design assumes $cov\left(\epsilon_{it}^{St}, v_{it}\right) - cov\left(\epsilon_{it}^{Nat}, v_{it}\right) = 0$; that is, the policy-makers selection variable is unrelated to state-year transitory shocks that affect differentially the state and national banking systems. This assumption carries two major concerns. According to Barnett and Cooke (1911), the different types of banking systems were not randomly distributed in terms of their location within each state. Specifically, national banks were more common in urban areas due to higher minimum capital requirements, whereas state banks could be found in urban and semi-urban areas. In addition, other contemporaneous sources (The Bankers' Magazine and Statistical Register, 1902a) identify the main difference between state banks and national banks as the "greater freedom from restrictions that seem to personally interfere with the personal independence of the banker and less fear of prosecution if things go wrong." In terms of the model, there is a serious identification threat if factors associated with these differences also drive the adoption of disclosure regulation; that is, if they affect v_{it}. I explicitly deal with these concerns in the robustness section.

5   Empirical Results

5.1   Effects on Financial Stability

Table 3 presents the results for the failure-rate analysis. In all specifications, I control for potential non-linear effects of the number of banks in the failure-rate variable by including five splines for the number-of-banks variable.[19] Overall, the results support the prediction that reporting requirements significantly reduced the incidence of bank failures in the state banking systems. I estimate the impact of reporting requirements to be a 0.8 to 2.4 percentage points reduction on the average failure rate. Columns (1) and

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[19]All results are robust to this research design choice.

(2) show the difference in average banking system failure rates before and after the adoption of these regulations. The coefficients are negative but not statistically significant. Nonetheless, these results are not critical because they do not account for important sources of variation. Columns (3)-(6) present the results with the fixed-effects structure. The coefficients associated with reporting requirements become statistically significant in column (3) and remains economically significant in the full-fledged model of column (5) despite becoming statistically insignificant due to the loss of degrees of freedom that the full fixed-effects structure entails. The incremental effect of periodic on-site supervision remains insignificant in these specifications. Columns (7) and (8) include controls for the aggregate solvency and liquidity of the system. I introduce these controls because these regulations affect the prudential ratios of the banking system. After controlling for these variables, the magnitude of the estimated coefficients increases relative to those of prior specifications, providing comfort concerning the stability of the results.

My estimates of columns (7) and (8) suggest reporting requirements reduce the failure rate of state banks between 1.8 and 2.4 percentage points. These estimates compare to an unconditional average of the failure rate of state banks prior to the introduction of reporting requirements of 1.8 percent. Thus the magnitude of the estimates in the complete model of Table 3 are arguably too strong. A potential explanation is that states with very few banks had very large failure rates whenever a bank failed, thereby originating outliers that could affect the results. I re-estimate the model of columns (7) and (8) in a restricted sample including only banking systems with more than 15 banks. In unreported results, I find a 1 percentage point reduction in the failure-rate coefficient after the introduction of reporting requirements. I also re-estimate the same empirical model using weighted least squares regression to put less weight into smaller banking systems. Using weighted least squares, the adoption of reporting requirements results in 0.9 p.p. reduction in the failure-rate of state banks – also unreported. In both alternative specifications, the economic magnitude becomes more plausible, while the coefficients remain statistically significant at the 5% level.

Overall, the results support the hypothesis that reporting requirements enhance the stability of the banking system. They also suggest periodic on-site supervision does not incrementally contribute to the stability of the system.

5.2 Effects on Aggregate Balance-Sheet Ratios and Deposit Rates

In what follows, I confine my attention to the main empirical specification presented in equation 6. Table 4 presents evidence on the impact of disclosure regulation on equity capital ratios and deposit structure of financial intermediaries. The results in columns (1) and (2) support the predictions of the agency

theoretical models of financial intermediation. The adoption of reporting requirements is associated with a significant three percentage points reduction in the equity capital ratio. Column (2) suggests periodic examinations do not have significant effects on equity capital ratios.

The remaining columns in Table 4 show the results of the deposit structure analysis. After the introduction of reporting requirements, the fraction of short-term demand-deposits decreases by approximately four percentage points, whereas the share of long-term time deposits rises by approximately five percentage points. The results also suggest periodic examinations significantly reduce the maturity of deposit liabilities. The coefficient is economically weaker than that of reporting requirements but statistically significant. A possible interpretation is that depositors react negatively to the increase in government intervention in the banking system.

The implementation of the main empirical specification to the deposit-rate analysis is limited by the relatively small size of the deposit-rate sample. I opted for the following empirical specification:

$$Y_{ist} = \alpha_t + \rho_{is} + \beta D_{ist-1} + \epsilon_{ist}$$

where Y_{ist} is either the deposit or loan rate for banking system i in state s and period t, α_t represents year fixed effects that are introduced to control for common variation in the bank rates across time, ρ_{is} are state-banking system fixed effects that control for the invariant characteristics and rules of banking systems in each state, and the remaining variables are defined as in the main empirical specification.

Table 5 presents the results of the deposit-rate analysis. Columns (1) and (3) support the prediction that reporting requirements reduce the equilibrium rate paid by state banks in the deposit market. The statistical evidence indicates that deposit rates drop between 0.4 and 0.8 percentage points following the adoption of these regulations. The model of column (3) indicates that periodic examinations have a statistically insignificant effect on deposit rate. Columns (5) and (7) display the empirical results of estimating the main empirical specification in equation 6. Unsurprisingly, the loss of degrees of freedom makes the results statistically insignificant. Nevertheless, I find no signs of attenuation of the regression results relative to the less demanding analyses of columns (1) and (3).

Overall, the results of the deposit rate analysis are reassuring because the sample period of the analysis only partially overlaps with that of the aggregate balance-sheet regressions. The stability of the main findings across different sample periods and outcome variables indicates the main mechanisms driving the results are in effect regardless of the sample period examined in the paper.

5.3 Effects on Financial Development and Access to Credit.

The empirical proxy for financial development used in this study is the total number of banks per capita operating in the state. According to Rajan and Ramcharan (2011b), the structure of banking was primarily local and as such the number of banks per capita is crucial for access to financial services. Alas, the total number of banks per capita in a state does not contain within-state-year variation as the other outcome variables do. As a result, I estimate the impact of disclosure regulation using the following diff-in-diff specification:

$$Y_{it} = \alpha_t + \rho_i + \beta D_{it-1} + \omega X_{it} + \epsilon_{it}$$

where Y_{it} is the natural log of the total number of banks per capita in state i and year t, α_t is a year fixed effect, ρ_i represents the state-fixed effects, D_{it-1} is defined as above, and X_{it} includes five splines for the total population in the state and the percentage of urban population. Finally, ϵ_{it} is a state-year-specific idiosyncratic shock.

The results of Table 6 suggest the introduction of reporting requirements is associated with a 15 percent increase in the total number of banks per capita in the state. The results of column (2) indicate periodic examinations do not have a statistically significant effect on financial development. The loan-rate analysis follows a similar model to that employed in the deposit-rate analysis. Table 5 suggests the interest rate on loans – whose evolution is a measure of changes in access to credit – decreases by one p.p. with the introduction of reporting requirements. The results provide indirect evidence that disclosure regulation eases entry restrictions by allowing potential entrants to commit to disclosure, and by facilitating access to capital for new bankers. Nevertheless, more direct evidence and tests on the precise mechanism through which mandatory disclosure affects the cost of entry for banking institutions would be valuable.

6 Analysis of the Banking Referenda in Illinois and Michigan

A detailed analysis of the consequences of disclosure regulation should also entail an investigation of the motives prompting their introduction. This section briefly explores the motivations behind the adoption of disclosure regulation in the banking sector through the guidance of the private interests literature. I examine whether the presence of some interest groups hinder or foster the passage of these statutes. Specifically, I focus on the role of two interest groups that could potentially lose their rents with the adoption of legislation promoting financial development: large landowners and small private bankers.

According to Rajan and Ramcharan (2011b), the agricultural elite had incentives to hamper financial development in their communities. First, the large loanable surpluses that large landowners generated, would earn higher rents if competition in local banking markets was not intense. Second, the unavailability of banking facilities meant large landowners could extract rents out of tenants and small farmers, who would have no other options to finance their equipments purchases for their activities. Finally, underdeveloped credit markers also meant large landowners were the only source of inside liquidity in the community. Hence large landowners could take advantage of financial distress by acquiring land at bargain prices.

Small private bankers might also have had incentives to restrict financial development. As discussed in Rajan and Zingales (2003b), without a basic set of government regulations preventing fraud and abuse, depositors only trust their savings to the most reputed and trusted bankers in their community. Hence the set of potential entrants is limited to members of the community with sufficient reputational capital, thereby allowing incumbent financiers to take advantage of these entry barriers to extract abnormal rents. Reporting requirements and periodic on-site examinations are arguably part of the basic set of rules ensuring a minimum level of depositor protection. Small private bankers, who were unregulated and relied on superior reputational and relationship capital, had incentives to campaign against the introduction of regulations that would reduce barriers to entry and erode their competitive advantage.

I examine the county voting patterns in the 1888 referenda of the banking laws in Illinois and Michigan to shed light on these issues. The constitutions of these states required any amendment to the general banking law to be ratified through a popular vote. In 1887, both state legislatures approved amendments to the general banking law creating a state banking supervisory authority that was required to periodically inspect every state-chartered financial institution at least once a year. Moreover, according to unofficial contemporary sources, the Illinois referendum might have also been a vote on reporting requirements because the pre-Civil War law mandating disclosure of financial statements for state banks was not enforced by any institution. As noted in White (1985), who studies the Illinois bank branching referendum of 1924, powerful political and economic lobbies organized to persuade voters to side with them, whereas the public interest was too diffuse to form a strong coalition. I study the county outcomes of these referenda as small-scale experiments unveiling which pressure groups pushed for or against disclosure regulation.

I follow Rajan and Ramcharan (2011b) and measure the strength of landed interests using the Gini coefficient[20] of the agricultural land size distribution in each county. A high value of this measure indicates the coexistence of a large agricultural elite and a large number of small farmers within the county. This coexistence is a necessary condition for the existence of a potentially exploitative relation that could be

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[20]Details concerning the computation of this measure can be found in Rajan and Ramcharan (2011b)

severed by financial development. A measure of the strength of small private bankers is the percentage of private bankers among the financial institutions in the county. A high percentage of private bankers suggests the county is served primarily by banks relying on reputation to conduct their business. The introduction of an intermediate layer of regulation would threaten their rents, because their reputational capital becomes less important and their markets become more exposed to entry from outsiders.

To test these issues, I implement the following empirical specification:

$$\%Yes\ Vote_i = \alpha + \beta_1 Gini_i + \beta_2 Banks\ p.c._i + \beta_3 No\ Banks_i + \beta_4\%\ Private_i + \gamma X_i + \epsilon_i,$$

where $\%Yes\ Vote$ is the percentage of votes in the county in favor of the regulation, $Gini$ is the Gini coefficient of inequality in the distribution in agricultural land size in the county, $Banks\ p.c.$ is the number of banks per one thousand inhabitants in the county, $No\ Banks$ is an indicator variable that takes the value of one if the county does not have any commercial banks of any type, $\%\ Private$ is the percentage of private banks in terms of the total number of banks in the county, and X_i is a set of control variables for demographics, political preferences, and economic development in the county.

Results are reported in Table 7. Consistent with the above hypotheses, greater inequality in the distribution of landed interests and higher percentages of private bankers are negatively associated with the percentage of county votes in favor of the legislation. The coefficients on the Gini index variable are very robust to the inclusion of other covariates. The coefficient is not attenuated as I introduce more controls for demographic and political characteristics in the analysis. In addition, the Gini index coefficient becomes weaker as the proportion of manufacturing output to total output increases in the county. This finding – which resembles that of Rajan and Ramcharan (2011b) – suggests intensive consumers of the banking services, such as manufacturers, act as a countervailing force muting the influence of the agricultural elite. The coefficients of the small private banks variable are attenuated as I include more variables in the analysis. This reduction in economic and statistical significance raises some concerns about the real importance of small private banks as an interest group opposing disclosure regulation.

These results are subject to an important caveat. The laws that were subject to the referenda in these states also contained provisions that implemented minimum capital requirements and double liability of stockholders; that is the stockholders were responsible for the liabilities of the bank up to the double of the subscribed capital in the institution. To that extent, one could claim the joint introduction of these regulations counfound the results. Nevertheless, these statutes of the law constitute an increase in entry barriers and therefore should bias against finding results in the hypothesized direction. In fact,

White (1985) suggests incumbent financiers lobby for the introduction of regulation that raises capital requirements.

Overall, the results support the idea that political and economic interests lobby against regulations to protect their private interests. The staggered introduction of these regulations could be related to a sustained loss of influence of the agricultural elites and incumbent financiers in shaping the regulatory environment. To the extent that both national and state banks were more prevalent in urban and semi-urban areas, these results provide some validity to the analysis in the first part of the study, regarding the consequences of these regulation.

7   Role of Private Interests in the Effects of Disclosure Regulation

The analyses of the previous sections suggest that reporting requirements advance the stability and development of the banking system and that some interest groups have incentives to deter disclosure regulation in order to preserve their rents. I explore whether the treatment effects of disclosure regulation varies with the inequality of land distribution and with the percentage of small private banks in the state. For various reasons, treatment effects are unlikely to be uniform throughout the United. States. Yet, how the relative strength of these interest groups affects the role of reporting requirements and periodic examinations is unclear. On one hand, incumbent financiers and the agricultural elite have incentives to use their political clout to undermine the effective implementation and enforcement of these disclosure statutes. Hence disclosure regulation, because of its poor enforcement, will have a weak impact in states with strong private interests (e.g. Christensen et al., 2012). On the other hand, once disclosure regulation and particularly reporting requirements are adopted, private interest groups may be able to do little to undermine its enforcement. Glaeser and Shleifer (2003) argue disclosure regulation may be less prone to subversion of justice than contract or tort law. Hence private interest groups have incentives to use all their clout to deter disclosure regulation because after its passage circumventing it would be difficult. Lawmakers in states with a high prevalence of private interests will face stiff opposition on this subject and will only pass these rules when they are clearly needed. Accordingly, I expect disclosure regulation to have stronger effects when private interests are particularly powerful. To explore this empirical question and test for cross-sectional differences in the effects of these regulatory innovations, I extend the main empirical specification to include partitioning variables that allow the estimation of different slope coefficients in states with high/low predominance of adversarial interests:

$$Y_{ist} = \alpha_{it} + \eta_{st} + \rho_{is} + \theta D_{ist-1} \times Part_{High} + \omega D_{ist-1} \times Part_{Low} + \gamma X_{ist} + \epsilon_{ist} \qquad (7)$$

I implement two partitioning variables that proxy for the strength of the selected private interest group in each state. $Part_{High}$ is an indicator variable taking the value of one if the value of the Gini coefficient of inequality in land size distribution or the percentage of private banks in the state exceed the respective median value across all states in a particular year. The remaining variables' definition is similar to that presented in the main empirical specification. For the sake of brevity, Table 8 reports the results for the failure rate and number of banks per capita variables.[21]

Panel A of Table 8 shows the impact of differences in inequality of agricultural land size distribution on the effects of regulatory policy. Consistent with the hypothesis that a strong agricultural elite exerted pressure to delay the passage of disclosure regulation, the results suggest reporting requirements and periodic examinations had a statistically significant larger impact in states where landed interests were most prevalent. The empirical analysis of Panel B in Table 8 does not yield any strong results. Differences in the proportion of banking institutions belonging to the small private banking system do not significantly affect the effectiveness of the policies. The evidence indicates private banks did not have significant influence over state regulation. The apparent disconnect between these results and those of the previous section may be explained using public choice theory. Private banks could be too small and dispersed to actively influence regulatory policy at the state level, but large enough to coordinate their efforts to campaign against disclosure regulation at the county level.

8   Conclusion

The recent financial crisis revived the need to understand how disclosure regulation affects the stability and development of the banking system. The public disclosure of the stress-test exercises conducted on major banking institutions in the United States and Europe generated significant debate. The main argument against public disclosure stemmed from concerns that public information might trigger panic-based bank runs. On the other hand, public disclosure of stress tests could exert discipline on the major banking institutions and give them ex-ante incentives to avoid excessive risk taking.

Recent studies (Goldstein and Sapra, 2011; Bischof and Daske, 2012) have examined the impact of

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[21]The results using the equity capital ratio, proportion of demand-deposits and proportion of time deposits are not substantially different from those presented in Table 8. The only anomaly that must be reported is that the equity capital ratio drops significantly more after the introduction of reporting requirements in States with low inequality of agricultural land size distribution.

public disclosure of stress-tests on bank's risk taking behavior. Yet, these studies face major identification challenges in distinguishing between the effects of public disclosure and the effects of concurrent events and news that affect financial markets daily. Moreover, most studies do not address the possible interactions between disclosure regulation and other characteristics of the banking system, such as deposit insurance coverage, regulations on banking activity, among other issues.

This paper steps back in time and examines the role of disclosure regulation on the stability and development of the U.S. state banking systems of the late nineteenth century. This setting offers extensive intertemporal and spatial variation in the implementation of disclosure regulation, allowing me to better isolate the effects of regulation from those of other concurrent banking and macroeconomic events. In addition, focusing on the early state banking systems of the U.S. States allows me to abstract from the interaction of disclosure regulation with other features of the banking system. Namely, geographical expansion through bank branching was limited and the initial experiences with state deposit insurance funds were only implemented in a few states closer to the end of the period of analysis.[22],[23]

Consistent with the prediction that the adoption of disclosure regulation reduces the risk of expropriation and diversion of resources by bank insiders, I find the failure rate of state banks drops after the adoption of mandatory reporting requirements and certain aggregate balance-sheet ratios of the state banking systems react as if the system became more secure and worthy of depositors' trust. Mandatory reporting requirements are also associated with an increase in the financial development of the adopting state. On the other hand, the effects of periodic supervision requirements are not statistically significant.

This setting allows me to cleanly identify how disclosure regulation affects the stability and development in systems where few regulations protecting depositors are in place. I add to the literature by providing empirical evidence suggesting that, in these circumstances, disclosure regulation matters. Over the past century, banking products became increasingly complex, the speed of information flow increased dramatically and the prudential regulation structure in most countries now include many more safeguards. These changes have potentially altered the relative importance of disclosure regulation relative to other microprudential standards. Nevertheless, I consider that the findings on this paper could be a starting point for a discussion of the role of disclosure regulation in modern banking systems.

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[22] According to a Federeal Reserve report on branching, the number of bank branches in 1900 was less than 1% of the total banking facilities in the country

[23] These states were Kansas (1909), Nebraska (1911), Oklahoma (1908) and Texas (1910)

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Appendix - Additional Sensitivity Tests

In this appendix, I report a series of robustness checks gauging the sensitivity of the main analysis in the text to (1) alternative methods for computation of standard errors, (2) alternative sample compositions, (3) alternative proxies for financial stability, and (4) the inclusion of additional control variables. In what follows, I test the robustness of the main results using the empirical model of column (8) in Table 3 and column (2) of Table 6.

First, I analyze the impact of disclosure regulation, clustering the standard errors at the state-banking system level. Bertrand, Duflo, and Mullainathan (2004) argue that when the dependent variable is serially correlated and the treatment variables change little over time, the OLS standard errors of differences-in-differences estimators are likely to understate the true standard deviation. Even though, the failure rate variable is not highly serially correlated and the treatment variable is not defined at the state level,

I cluster the standard errors at the state-banking system level to check the sensitivity of the statistical inferences to these issues. The first row of Table 9 shows the reporting-requirements coefficient remains statistically significant at the ten percent level.

Second, I check the sensitivity of the results to the exclusion of states that adopted the disclosure regulation during or immediately after the financial crises of 1893 and 1907.[24] If policymakers react to episodes of banking crisis by adopting new regulations, the estimated coefficients could partially capture mean reversion in the failure rate and number of banks. I address this concern by excluding states that adopted regulations in the year of or one year after a financial crisis episode. The results presented in the second row of Table 9 confirm this concern does not significantly affect the results. If anything, the coefficient on the reporting-requirements variable becomes stronger in the financial-stability regression, whereas the periodic-examinations coefficient remains non-significant.

Third, I employ alternative measures of financial stability. I hand-collected the failure-rate variable used in the main analysis from the Annual Reports of the Comptroller of the Currency. Hence this analysis is prone to human errors in the data-collection stage. I use an alternative failure-rate variable provided in Grossman (2001) to test the robustness of the results to the hand-collection process. This dataset also contains a measure of the total assets in failed banks as a percentage of the total assets in the banking system. I use this variable to gauge the sensitivity of the main results to an alternative proxy for financial stability. The Grossman (2001) dataset is not as comprehensive in terms its coverage of the states. Nevertheless, the results are not sensitive to the use of alternative proxies for financial stability.

Finally, I check the robustness to the inclusion of additional control variables. State legislatures often passed statutes altering or imposing minimum capital and reserve requirements concurrently with those passing disclosure and regular examinations requirements. However, as I previously discussed, controlling for these requirements is cumbersome, because they varied within state according to the population of the place where the state bank was located. Alternatively, I control for the introduction of double liability for state banks. Under double liability, shareholders of failing banks were liable not only for the amount of their initial investment, but also for an additional amount up to par value of the shares owned. Double liability was viewed as a risk-reducing measure and as such can be regarded as complementary to the introduction of capital and reserve requirements. Moreover, according to Grossman (2001), no other regulatory innovation spread as far and as rapidly as double liability, thereby suggesting this regulatory innovation was very important. In the fifth row of Table 9, I present the results of the main analysis after controlling for the effects of the double-liability statutes, using the data provided in Grossman (2001). The results show the

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[24]The 1893 and 1907 crises are the only systemic crises during my sample period.

coefficient on the reporting-requirements variable is not sensitive to the introduction of a control variable for the double liability statute. The same cannot be said of the results for the financial-development analysis. After I control for double liability, the coefficient associated with reporting requirements loses economic magnitude and its statistical significance. However, the use of this sample halves the number of available observation in the financial development analysis. Thus the fact that in the analysis the coefficient displays some heterogeneity and loses some statistical power is not surprising.

The other main source of concern is that local shocks to economic conditions generate the cross-sectional and temporal variation in the adoption of disclosure regulation and differentially affect the two types of banking systems. A potential threat stems from the different regulatory restrictions imposed on the composition of the asset portfolios of national and state banks. National banks could only acquire real-estate-backed assets in the process of debt collection and these assets had to be disposed of within five years (Barnett and Cooke, 1911). State banks faced less stringent limitations on their holdings of real estate assets. As a result, if the intertemporal and spatial variation in disclosure regulation is related to shocks affecting the value of real estate assets, the main empirical analysis could be flawed. Ideally, I would deal with this issue by parsing out the variation in the failure-rate variable resulting from shocks to a local index of real estate prices and using the variation in failure rates that is orthogonal to the real estate prices. However, to my knowledge, no such real estate price index exists at the state or county level for that time period. Alternatively, I control for the percentage of loans collateralized by real estate in the total assets of the banking system in each state and year. If the main results of the paper stem from local shocks to the value of real estate assets that affect state and national banks differentially and simultaneously drive the implementation of disclosure regulation, controlling for the percentage of real estate assets in the banking system should absorb that variation and significantly attenuate the coefficients of the main analysis. Row 6 of Table 9 shows the results are not sensitive to the inclusion of these control variables.

As a final robustness exercise, I implement an empirical specification that allows me to control for characteristics of the state that vary across time but are invariant across banking systems within a state-year. The empirical strategy is to estimate the following empirical specification:

$$Y_{i,State,t} - Y_{i,Nat,t} = \underbrace{\eta_{State,t} - \eta_{Nat,t}}_{\eta_t^\star} + \underbrace{\rho_{s,State} - \rho_{s,Nat}}_{\rho_s^\star} + \beta D_{i,State,t-1} + \gamma \left(X_{i,State,t} - X_{i,Nat,t} \right) + \omega X_{it} + \epsilon_{i,State,t} - \epsilon_{i,Nat,t}. \quad (8)$$

Taking differences between state and national banking systems within each state-year, I obtain an equivalent estimator to that of the main empirical model in equation 7. Yet, this within-differences

estimator allows me to control for state-year events that plausibly have asymmetrical effects on each banking system. To the extent that national banks are more concentrated in urban centers than state banks, it is important to gauge whether including factors that disproportionately affect the urban centers within each state (e.g. surge in the manufacturing sector) attenuate the coefficients associated with the reporting-requirements variable. Attenuation would suggest that systematic differences in geographical location of state and national banks drive the main results in the paper. I estimate the above empirical model while controlling for the log of total population, the urbanization rate, and manufacturing output in the state as a percentage of agricultural and manufacturing output. Row 7 of Table 9 suggests inclusion of these factors in the empirical specification does not significantly affect the results.

Table 1: Reporting Requirements and Regulatory Examinations Adoption Dates

State	Bank. System	Rep.	Exam.	State	Bank. System	Rep.	Exam.	State	Bank. System	Rep.	Exam.
Alabama	State	1904	1904	Maryland	State	1870	1898	Oregon	State	1907	1907
Arizona	State	1893	1893	Massachusetts	State	(a)	(a)	Pennsylvania	State	(a)	1891
Arkansas	State	1913	1913	Michigan	State	(a)	1888	Rhode Island	State	(a)	1908
California	State	1878	1878	Minnesota	State	(a)	1878	South Carolina	State	1906	1906
Colorado	State	1877	1907	Mississippi	State	1888	1914	South Dakota	State	1891	1891
Connecticut	State	(a)	(a)	Missouri	State	1877	1895	Tennessee	State	(a)	1914
Delaware	State	1903	1903	Montana	State	1887	1895	Texas	State	1905	1905
Florida	State	1869	1889	Nebraska	State	1877	1889	Utah	State	1888	1905
Georgia	State	1891	1890	Nevada	State	1907	1907	Vermont	State	(a)	(a)
Idaho	State	1905	1905	New Hampshire	State	(a)	-	Virginia	State	1884	1910
Illinois	State	(a)	1888	New Jersey	State	(a)	1889	Washington	State	1886	1907
Indiana	State	(a)	1873	New Mexico	State	1884	1903	West Virginia	State	1891	1891
Iowa	State	(a)	1873	New York	State	(a)	1884	Wisconsin	State	(a)	1895
Kansas	State	1891	1891	North Carolina	State	1887	1889	Wyoming	State	1888	1888
Kentucky	State	1869	-	North Dakota	State	1890	1890				
Louisiana	State	1882	1898	Ohio	State	(a)	1908				
Maine	State	(a)	(a)	Oklahoma	State	1897	1897				

(a) stands for implemented in the pre-civil war period.

Table 2: Summary Statistics of the Banking Systems Characteristics

Panel A presents descriptive statistics of selected variables for state and national banking systems separately. The sample period corresponding to each variable varies considerably due to data availability issues. *Number of Banks* is the number of banks in each banking system for each year and state as reported by Barnett and Cooke (1911). *Total Assets* and *Total Deposits* for each banking system are taken from Flood (1998). *Real Estate Loans (% Total Assets)* is defined as $(Real\ Estate\ Loans)/Total\ Assets$, where *Real Estate Loans* is taken from the aggregate balance-sheets of each banking system for each state and year provided by Flood (1998). Panel B presents differences-in-differences analysis for the main outcome variables used in the study. National banks were always regulated, thus the Pre-National cell in the diff-in-diff tables correspond to the average ratios for national banks for state-years in which state banks were not regulated. *Failure Rate* is defined as $(No.Failure)/No.Banks$, where the number of failures in each banking system for each year and state are taken from the statistics reported in each Annual Report of the Comptroller of the Currency between 1892 and 1908 and the number of banks in each banking system for each year and state are taken from Barnett and Cooke (1911). *Equity Capital Ratio* is defined as $(Capital+Surplus)/Total\ Assets$, where capital, surplus and total liabilities are taken from the aggregate balance-sheets of each banking system for each state and year provided by Flood (1998). *% Demand Dep*, *% Time Dep* are defined as $(Demand\ Deposits)/Total\ Deposits$ and $(Time\ Deposits)/Total\ Deposits$, respectively. Demand and time deposits.are also taken from Flood (1998). *Average Loan Rate* and *Average Deposit Rate* are the average loan and deposit rate for state and national banks that answered the Comptroller's inquiry to state and national banks in each state and year regarding the rates they practiced at prespecified dates in time. Standard errors are robust to heteroskedasticity.

Panel A: Descriptive statistics of selected variables disaggregated by banking system type

State Banking System

	N	Mean	St. Dev	p25	p50	p75
Number of Banks	1727	106.7	158.8	7	36	144
Total Assets	864	199,352	495,781	22,232	61,372	149,897
Total Deposits	864	163,457	419,717	16,308	45,669	124,721
Real Estate Loans (% Total Assets)	864	15.6	10.2	8.8	12.4	20.3

National Banking System

	N	Mean	St. Dev	p25	p50	p75
Number of Banks	1734	85.8	111.3	17	48	100
Total Assets	864	148,474	303,136	20,863	52,757	125,205
Total Deposits	864	108,560	235,020	13,238	34,172	91,519
Real Estate Loans (% Total Assets)	864	1.0	0.8	0.4	.8	1.4

Panel B: Differences-in-differences in outcome variables

Dependent variable: Failure Rate

	Pre	Post	ΔPost-Pre
State	0.018	0.006	-0.012
	(0.006)	(0.0008)	(0.006)
National	0.008	0.006	-0.002
	(0.003)	(0.0007)	(0.002)
ΔSt.-Nat.	0.01	0.0007	-0.009
	(0.006)	(0.001)	(0.006)

Dependent variable: Equity Capital Ratio

	Pre	Post	ΔPost-Pre
State	29.8	20.2	-9.6
	(0.9)	(0.2)	(0.9)
National	26.5	22.6	-3.9
	(0.8)	(0.2)	(0.8)
ΔSt.-Nat.	3.3	-2.4	-5.7
	(1.2)	(0.3)	(1.2)

Dependent variable: % Demand Dep.

	Pre	Post	ΔPost-Pre
State	71.8	51.1	-20.7
	(1.6)	(0.8)	(1.8)
National	78.4	70.1	-8.3
	(1.3)	(0.4)	(1.4)
ΔSt.-Nat.	-6.6	-19.1	-12.4
	(2.1)	(0.9)	(2.3)

Dependent variable: % Time Dep.

	Pre	Post	ΔPost-Pre
State	24.7	45.9	21.2
	(1.7)	(0.9)	(1.9)
National	10.7	12.1	1.4
	(1.5)	(0.4)	(1.6)
ΔSt.-Nat.	14.0	33.8	19.8
	(2.3)	(1.0)	(2.5)

Dependent variable: Av. Loan Rate

	Pre	Post	ΔPost-Pre
State	10.97	8.32	-2.64
	(0.56)	(0.21)	(0.59)
National	9.73	7.81	-1.91
	(0.41)	(0.21)	(0.46)
ΔSt.-Nat.	1.24	0.51	-0.73
	(0.70)	(0.30)	(0.75)

Dependent variable: Av. Deposit Rate

	Pre	Post	ΔPost-Pre
State	3.78	3.86	0.08
	(0.46)	(0.13)	(0.47)
National	3.88	3.19	-0.69
	(0.22)	(0.11)	(0.24)
ΔSt.-Nat.	-0.10	0.67	0.77
	(0.51)	(0.17)	(0.53)

Table 3: Effects of Reporting Requirements and Periodic Examinations on Bank Failure Rates

This sample comprises 1,857 observations referring to the failure rate of national and state banking systems for 48 US states and territories in the period ranging from 1892 to 1913. *Failure Rate* is defined as $(No.Failure)/No.Banks$, where the number of failures in each banking system for each year and state are taken from the statistics reported in each Annual Report of the Comptroller of the Currency between 1892 and 1913 and the number of banks in each banking system for each year and state are taken from the state legislatures. *Exam* is also an indicator variable that takes the value of one beginning in the year after the adoption of mandatory reporting requirements by state examiners. Capital Ratio and Liquidity Ratio are defined as $(Capital+Surplus)/Total Assets$ and $\frac{(Cash Assets)}{Total Assets}$, respectively. All specifications control for non-linear effects of the number of banks in the banking system in each year and state using four splines for the number of banks variable.

Results are reported for eight empirical specifications. Specifications (1) and (2) examine the univariate correlations between reporting requirements, periodic on-site supervisions and the failure rate without controlling for the aggregate solvability and liquidity of the system. Specifications (3) and (4) are identical to (1) and (2) except for the inclusion of indicator variables that control for characteristics that are invariant at the state-year and banking system-year levels. Specifications (5) and (6) are similar to (3) and (4) but further control for possible state-banking system type fixed effect. These specifications are those corresponding to the full-fledged model presented in the empirical implementation section. Specification (7) and (8) presents the same fixed effects structure of (5) and (6) but includes controls for the aggregate solvency and liquidity of the system. It is worth noting that the number of observation in these specifications is smaller due to the unavailability of aggregate balance-sheet data over the 1892-1896 period. In all specifications, I control for the number of banks in each banking system including five splines of the number of banks variable. Standard errors are heteroskedasticity-robust.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
	Failure Rate	Failure Rate	Failure Rate	Failure Rate	Failure Rate	Failure Rate	Failure Rate	Failure Rate
Rep (lagged)	-0.0083	-0.0045	-0.0116*	-0.0035	-0.0128	-0.0184	-0.0186*	-0.0242*
	(0.005)	(0.006)	(0.007)	(0.010)	(0.010)	(0.015)	(0.010)	(0.013)
Exam (lagged)		-0.0044		-0.0003		0.0065		0.0064
		(0.003)		(0.007)		(0.011)		(0.008)
Capital Ratio							-0.0434	-0.0419
							(0.036)	(0.036)
Liq. Ratio							0.0025	0.0031
							(0.011)	(0.011)
Observations	1,857	1,857	1,857	1,857	1,857	1,857	1,467	1,467
Adjusted R-squared	0.031	0.032	0.164	0.219	0.191	0.191	0.278	0.278
State-Year fixed effects?	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year-BankType fixed effects?	No	No	Yes	Yes	Yes	Yes	Yes	Yes
State-BankType fixed effects?	No	No	No	No	Yes	Yes	Yes	Yes

*, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively for a two-tailed test

Table 4: Effects of Mandatory Reporting and Supervisory Examinations on Banking Outcomes

This sample comprises 1,728 observations refering to the national and state banking systems for 48 US states and territories in the period ranging from 1896 to 1913. *Capital Ratio* is defined as $(Capital+Surplus)/Total\ Assets$, where capital, surplus and total assets are taken from the aggregate balance-sheets of each banking system for each state and year provided by Flood (1998). *Time Dep.* is defined as $(Time\ Deposits)/Total\ Deposits$, where time deposits and total deposits are taken from the aggregate balance-sheets of each banking system for each state and year provided by Flood (1998). *Demand Dep.* is defined as $(Demand\ Deposits)/Total\ Deposits$, where demand-deposits and total deposits are taken from the aggregate balance-sheets of each banking system for each state and year provided in Flood (1998). *Rep* is an indicator variable that takes the variable of one beginning in the year after the adoption of mandatory reporting requirements by the state legislatures. *Exam* is also an indicator variable that takes the value of one beginning in the year after the enactment of periodic on-site supervisions by state examiners.
Results are reported for six empirical specifications. Specifications (1) and (2) examine the impact of reporting requirements and mandatory periodic on-site supervisions on the aggregate equity capital ratio while controling for control for characteristics that are invariant at the state-year, banking system-year and state-banking system levels. Specifications (3),(4) and (5), (6) have a similar specification to (1) and (2) but analyze the impact of reporting requirements and mandatory periodic on-site supervisions on the percentage of long-term and short-term deposits, respectively. In all specifications, the standard errors are robust to heteroskedasticity.

	(1)	(2)	(3)	(4)	(5)	(6)
	Capital Ratio	Capital. Ratio	Time Dep.	Time Dep.	Demand Dep.	Demand Dep.
Rep (lagged)	-0.0276***	-0.0354***	0.0516***	0.0784***	-0.0400***	-0.0620***
	(0.007)	(0.013)	(0.018)	(0.020)	(0.014)	(0.019)
Exam (lagged)		0.0088		-0.0302***		0.0247*
		(0.011)		(0.012)		(0.014)
Observations	1,728	1,728	1,728	1,728	1,728	1,728
Adjusted R-squared	0.892	0.892	0.961	0.961	0.949	0.949
State-Year fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Year-BankType fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
State-BankType fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes

*, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively for a two-tailed test

Table 5: Effects of Reporting Requirements and Periodic Examinations on Deposit and Loan rates

This sample comprises 263 observations refering to the average deposits and loan rates practiced by national and state commercial banks located in non-reserve cities of 48 US states and territories as of June 30th of 1889, 1894 and 1899. The data was collected from the 1899 Annual Report of the Comptroller of the Currency and result from a questionnaire sent by the Comptroller of the Currency in 1899 asking all commercial banks to report their average deposit and loan rates as of June 30th of 1889, 1894 and 1899. The data are gathered from tables included in the 1899 Annual Report of the Comptroller of the Currency containing the average deposit and loan rates by state and reserve city. I follow Gendreau (1984) in dropping the observations relating to reserve cities due to the confounding effects stemming from the role of clearinghouses in these reserve cities as deterrents to interest rate competition (see Cannon (1910)). *Int Dep* and *Int Loan* are the average deposit and loan rate for state and national banks answering the Comptroller's questionnaire in each state and year. *Rep* is an indicator variable that takes the value of one beginning in the year after the adoption of mandatory reporting requirements by the state legislatures. *Exam* is also an indicator variable that takes the value of one beginning in the year after the introduction of mandatory examinations by the state's official supervisors. Results are reported for eight empirical specifications. Specifications (1) and (2) examine the impact of reporting requirements in a differences-in-differences specification that includes fixed effects for each year and also for each possible state-banking system type combination. Specifications (3) and (4) are similar to (1) and (2) but includes both types of treatment effects variables. The specifications (5)-(8) implement the full model presented in the empirical implementation section. In all specifications, the standard errors are clustered at the state-year level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Int dep	Int loan	Int dep	Int loan	Int dep	Int loan	Int dep	Int loan
Rep (lagged)	-0.4379**	-1.0257**	-0.8192**	-1.0098**	-0.5437	-0.9814	-0.7463	-0.8470
	(0.185)	(0.397)	(0.394)	(0.478)	(0.572)	(0.987)	(0.755)	(1.012)
Exam (lagged)			0.4169	-0.0174			0.2569	-0.1704
			(0.375)	(0.279)			(0.660)	(0.389)
Observations	263	263	263	263	263	263	263	263
Adjusted R-squared	0.737	0.895	0.739	0.894	0.781	0.966	0.779	0.966
State-Year fixed effects?	No	No	No	No	Yes	Yes	Yes	Yes
Year-BankType fixed effects?	No	No	No	No	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes	No	No	No	No
State-BankType fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively for a two-tailed test

Table 6: Effects of Mandatory Reporting and Supervisory Examinations on Market Structure

This sample contains 1,637 observations covering 48 US states and territories over the 1876-1913 period. The unit of observation in this analysis is the state-year level. The outcome variable is defined as $ln\left(Tot\ banks/Tot.\ Pop.\right)$, where $Tot\ banks$ is the total number of banks (national, state, and private) operating in the state and $Tot\ Pop.$ is the total state population each year. Total number of banks was computed from data gathered from Barnett and Cooke (1911), whereas the total state population was taken from the decennial US census and interpolated for the non-decennial years. Rep is an indicator variable that takes the variable of one beginning the year after the adoption of reporting requirements in local newspapers. $Exam$ is also an indicator variable that takes the value of one beginning the year after the introduction of periodc on-site examinations by state supervisors. All regressions include splines for time-varying population levels and urbanization rates.

Results are reported for three empirical specifications. Specifications (1) and (2) examine the impact of reporting requirements and mandatory supervisory examinations in a standard differences-in-difference specification that includes fixed effects for each year and state. Specification (3) is similar to (1) and (2) except that it examines the introduction of both treatments jointly. In all specifications, the standard errors are clustered at the state level.

	(1)	(2)
	Log (Tot. Banks per capita)	Log (Tot Banks per capita)
Rep (lagged)	0.1607**	0.1773**
	(0.071)	(0.082)
Exam (lagged)		-0.0299
		(0.067)
Observations	1,637	1,637
Adjusted R-squared	0.888	0.888
Controls?	Yes	Yes
State fixed effects?	Yes	Yes
Year fixed effects?	Yes	Yes

*, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively for a two-tailed test

Table 7: Banking Referenda Analysis

This sample contains 180 observations covering 180 county referendum results in Illinois and Michigan in 1888. The unit of observation in this analysis is the county level. The outcome variable *% Yes* is defined as the percentage of favorable votes for the banking law in the county. *Ln (Gini)* is the measure of inequality in the size distribution of agricultural land in the county, and proxies for the power and incentives of agricultural elites to oppose financial development. It is calculated as the log of the Gini coefficient – see Rajan and Ramcharan (2011b) for details on the calculation of this measure – of the size of landed interests in the county using the 1890 census data on the size distribution of agricultural land. *Banks p.c.* is the total number of banks (national, state, and private) operating in the county per thousand inhabitants. *No banks* is a dummy variable that takes the value of one if the county does not possess any banking facility as of 1888. *% Private Bk.* is the percentage of private unincorporated banks as a percentage of total banks in the county. *% Democrat* is the percentage of democrat votes by county in the 1888 presidential elections. *% Progressive* is the percentage of progressive votes by county in the 1888 presidential elections. *Election Part.* is the percentage of presidential election turnout in the county. Ln(Total Population) is the log of the total population in the county as of 1888. This value is interpolated using the cubic splines method from the 1880 and 1890 census data. % Urbanization is the total population living in cities of +25,000 inhabitants as of 1890. % Black is the percentage of population in the county of African-American origins. Ln(Gini)×Manu. Share is an interaction term between the log Gini index and the manufacturing share in the county where the latter is defined as the value of manufacturing output in the county divided by the value of manufacturing output in the county plus the value of agricultural output in the county. *Manu. Share* is defined similarly. Standard errors are robust to heteroskedasticity.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	% Yes	% Yes	% Yes	% Yes	% Yes	% Yes	% Yes
Ln(Gini)	-0.2849***		-0.2891***	-0.3162***	-0.2635***	-0.6816***	-0.3416***
	(0.071)		(0.071)	(0.070)	(0.074)	(0.194)	(0.074)
Banks p.c.		0.1222	-0.0165	0.1311	0.0374	-0.1159	0.1160
		(0.126)	(0.124)	(0.123)	(0.121)	(0.128)	(0.136)
No Banks		-0.0685	-0.1221	-0.0925	-0.0216	-0.1554**	-0.0793
		(0.083)	(0.084)	(0.081)	(0.094)	(0.077)	(0.089)
% Private Bk.		-0.1584***	-0.1484***	-0.1566***	-0.0598	-0.0848	-0.0951*
		(0.055)	(0.054)	(0.052)	(0.052)	(0.053)	(0.049)
% Democrat				-0.2291			-0.1937
				(0.272)			(0.276)
% Progressive				-0.8185			-1.0867
				(1.144)			(1.128)
Election Part.				-1.6812**			-1.2542**
				(0.651)			(0.556)
Ln(Total Population)					-0.0161		0.0043
					(0.028)		(0.029)
% Urbanization					0.3688***		0.1195
					(0.083)		(0.126)
% Black					-0.7580*		-0.7620*
					(0.396)		(0.433)
Ln(Gini)×Manu. Share						0.5077**	
						(0.239)	
Manu. Share						0.7519***	0.1734**
						(0.239)	(0.087)
Observations	180	180	180	180	180	179	179
Adjusted R-squared	0.068	0.023	0.088	0.129	0.161	0.195	0.203
Specification	Agr. Elite	Inc. Fin	Agr. + Fin.	Political	Demographic	Manufacturing	All controls

*, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively for a two-tailed test

Table 8: Impact of Regulations in States with Different Levels of Private Interests.

For this analysis, I partition the treatment sample into two groups representing states with high/low inequality in agricultural land size distribution (Panel A) and high/low presence of unregulated private banks (Panel B). In Panel A, I use the Gini coefficient of land size distribution to assign the state to the high partition if its value is higher than the sample median for that particular year. In Panel B, I assign states to the high partition if the proportion of private banks in the state's total number of banks is higher than the median value. The values of the Gini coefficient of land size distribution are only available for census years. Hence, for the non-decennial years, I interpolate the Gini coefficient values using a natural cubic spline. The empirical specifications used in the analysis are similar to those presented in columns (7) and (8) of the failure-rate analysis and columns (1) and (2) of the financial-development analysis.

Panel A: Inequality in Agricultural Land Size Distribution

	(1)	(2)	(3)	(4)
	Fail. Rate	Fail. Rate	Ln(Tot.Bks p.c.)	Ln(Tot.Bks p.c.)
Rep×High Gini (lagged)	-0.0333***	-0.0407***	0.1958***	0.1438*
	(0.011)	(0.013)	(0.061)	(0.079)
Rep×Low Gini (lagged)	0.0010	-0.0072	0.0528	0.1273
	(0.008)	(0.014)	(0.072)	(0.080)
Exam×High Gini (lagged)		0.0085		0.0734
		(0.007)		(0.072)
Exam×Low Gini (lagged)		0.0091		-0.1293
		(0.011)		(0.082)
Observations	1,381	1,381	1,681	1,681
Adjusted R-squared	0.315	0.315	0.887	0.889
F-Test for Difference in Rep. Coefficients (p-value)	.0009***	.022**	.0056*	.778
F-Test for Difference in Exam Coefficients (p-value)	-	.960	-	.013**
Fixed effects?	Yes	Yes	Yes	Yes

Panel B: Differences in Prevalence of Small Private Banks

	(1)	(2)	(3)	(4)
	Fail. Rate	Fail. Rate	Ln(Tot.Bks p.c.)	Ln(Tot.Bks p.c.)
Rep×High Pct. Private Bks	-0.0226**	-0.0302**	0.1063	0.1538*
	(0.011)	(0.013)	(0.071)	(0.079)
Rep×Low Pct. Private Bks	-0.0147*	-0.0249**	0.1760**	0.2254**
	(0.009)	(0.012)	(0.079)	(0.100)
Exam×High Pct. Private Bks		0.0088		0.0224
		(0.007)		(0.068)
Exam×Low Pct. Private Bks		0.0101		-0.0788
		(0.010)		(0.101)
Observations	1,132	1,381	1,508	1,681
Adjusted R-squared	0.336	0.296	0.890	0.884
F-Test for Difference in Rep. Coefficients (p-value)	.2025	.609	.1849	.397
F-Test for Difference in Exam Coefficients (p-value)	-	.875	-	.323
Fixed effects?	Yes	Yes	Yes	Yes

*, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively for a two-tailed test

Table 9: Sensitivity Analysis for the Effects of Rep. Requirements and Supervisory Examinations.

This analysis uses the empirical models presented in column (8) of Table 3 and column (2) of Table 6. I report empirical results for the following robustness checks: (1) clustering the standard-errors in the failure rate analysis at the state-year level, (2) excluding from the sample, states adopting reporting requirements or periodic examinations in the year of or one year after a banking crisis episode, (3) using alternative data for the failure rate, (4) using the share of assets in failed banks in total assets of the state banking system as an alternative dependent variable, (5) controlling for the adoption of double liability provisions in the state, (6) controlling for the proportion of real estate loans held by the banking systems, and (7) using an alternative specification that takes differences between banking systems within a state in a given year to include state specific factors that vary through time, namely the state's natural log of total population, its urbanization rate and the percentage of output coming from the manufacturing sector.

Panel A: Financial-stability Analysis

		Reporting Requirements		Regular Examinations	
	N	Coefficient	St. Dev	Coefficient	St. Dev
(1) Clustering by state-banking system	1,467	-0.0242*	(0.013)	0.0064	(0.005)
(2) No states adopting during financial crises	1,185	-0.0415**	(0.017)	0.0124	(0.014)
(3) Failure rate variable from Grossman (2001)	1,262	-0.0231*	(0.013)	0.0049	(0.007)
(4) % Assets in failed banks	1,256	-0.0153*	(0.009)	0.0007	(0.004)
(5) Controlling Double Liability	1,155	-0.0193**	(0.009)	0.0070	(0.007)
(6) Controlling % Real Estate Loans	1,381	-0.0283**	(0.013)	0.0097	(0.008)
(7) Controlling for state-year variables	715	-0.0254**	(0.011)	0.0089*	(0.005)

Panel B: Financial-Development Analysis

(1) Clustering by state	1,637	0.1773**	(0.082)	-0.0299	(0.067)
(2) No states adopting during financial crises	1,392	0.1634*	(0.095)	-0.0034	(0.069)
(3) Controlling for double liability	784	0.0630	(0.066)	-0.0067	(0.056)

*, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively for a two-tailed test

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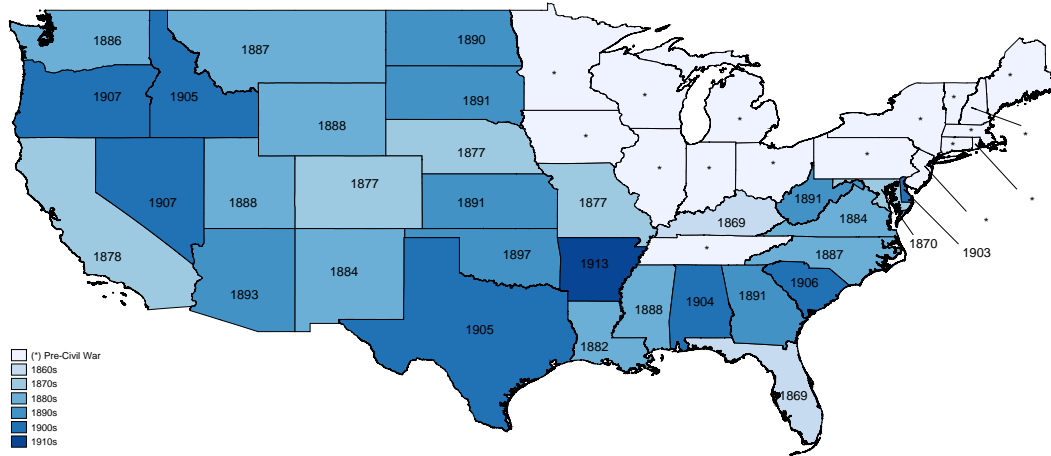Figure 1: Year of adoption of reporting requirements.

Figure 2: Year of adoption of periodic on-site examinations.