Corporate Governance and Risk Management at Unprotected Banks: National Banks in the 1890s

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Abstract

We examine bank governance and risk choices from the 1890s, a period without distortions from deposit insurance or other government assistance to banks. We link differences in managerial ownership to different corporate governance policies, risk, and methods of risk management. Formal corporate governance and high manager ownership are negatively correlated. Managerial salaries and self-lending are greater when managerial ownership is higher, and lower when formal governance is employed. Banks with high managerial ownership (low formal governance) target lower default risk. High managerial ownership rather than formal governance is associated with greater reliance on cash rather than equity to limit risk.

Keywords: Manager ownership, corporate governance, rent seeking, risk preferences, bank failures

JEL Codes: G21, G32, N21

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1. Introduction

Incentives of managers may conflict with those of outside shareholders and creditors, particular at highly leveraged and opaque institutions such as banks. Agency problems arise both with respect to the outright transfer of resources (e.g., excessive salaries or subsidized access to credit), as well as implicit transfers related to risk management practices (e.g., inadequate risk management effort or transfers from creditors to stockholders through "risk shifting"). Some risk shifting benefits managers at the expense of all claimants on the bank, while other forms of risk shifting benefit stockholders at the expense of creditors.[1] Bankers design contracting and governance structures that sufficiently resolve agency problems so that they can attract funding from minority shareholders and depositors.

Examining how banks resolve those conflicts in today's banking environment through their choices of ownership structure, governance and risk-management practices, and portfolio structure is complicated by government regulation of capital structure and corporate governance practices. Also, protections, such as deposit insurance, too-big-to-fail policies, and a lender of last resort, can distort incentives when making governance, ownership structure, and risk-management choices. To investigate the endogenous emergence of corporate governance mechanisms that limit rent seeking and credibly manage risk, we look at banks from the 1890s, a period when there was no deposit insurance, no lender of last resort, and virtually no government interventions to save banks.

We do so using national banks' Examination Reports, a detailed but seldom used resource that provides considerable information about banks' ownership structures, governance structures,

[1] Risk shifting or "asset substitution" refers to changes in the risk profile of investments designed to transfer value from some claimants to others. For example, the decision to invest less in risk management can result in private benefits to bankers at the expense of outside sources of funding (Holmstrom and Tirole, 1997). Also, an increase in the variance of returns typically transfers value from creditors to stockholders (Jensen and Meckling, 1976). Note that these two kinds of risk shifting differ in the identities of winners and losers.

tools for managing risk and levels of risk. This information allows us to link differences in ownership structure (especially the extent of managerial ownership) to differences in corporate governance policies, risk outcomes, and banks' approaches to risk management, including their portfolio structure choices. We find that exogenous variation in banks' circumstances result in important differences in ownership structure, risk taking, and corporate governance choices, which in turn result in important differences across banks in the extent of managerial rent extraction and the structure of banks' assets and liabilities. Banks that eschew formal corporate governance in favor of concentrated managerial ownership tend to experience higher managerial rent extraction, lower default risk on debt, higher cash holdings as a fraction of assets, and lower equity capital as a fraction of liabilities.

2. Literature review

The simplest class of agency problems revolves around the transfer of resources to insiders who maintain operational control over the bank.[2] Bank managers with sufficient control rights may pay themselves excessive salaries or give themselves access to credit on subsidized terms. For a sample of East Asian firms in the mid-1990s, Claessens, Djankov, Fan, and Lang (2002) find that concentrated management ownership increases firm value when ownership and cash flow rights are aligned, but in cases in which managers enjoy greater control rights than cash flow rights, managerial ownership concentration is value-destroying.

Control rights can also give rise to agency problems with respect to risk management, involving differences in portfolio choice, as modeled by Jensen and Meckling (1976), Myers (1977) and Merton (1977), or differences in risk-management effort, as modeled by Holmstrom and Tirole (1997). In general, managers who have large stakes in the performance of their banks may prefer to take less risk or to exert greater effort in managing risk in order to preserve their own financial

[2] See Shleifer and Vishny (1997) for a general review of issues in corporate governance.

wealth or their firm-specific human capital (see the discussion in Demsetz, Saidenberg, and Strahan, 1997; Laeven and Levine, 2009). In some cases, particularly in the presence of safety net subsidies, diversified outside equity holders with sufficient stakes in banks may seek to incentivize managers to take more risk and may employ pay schemes that reward risk taking (see Laeven and Levine, 2009; Cheng, Hong, and Scheinkman, 2013; Bai and Elyasiani, 2013).

Alternatively, there could be states of the world in which bank managers that had been managing risk carefully may become excessively risk loving without being provided performance incentives, such as states in which their equity interest in the bank becomes sufficiently small as the result of bank losses. In the wake of losses that reduce net worth and increase leverage, bankers with substantial equity shares and control rights may prefer to increase asset risk.[3] This moral-hazard problem in risk management can be mitigated through various measures, including short-term debt contracting; a first-come, first-served rule for bank liquidation; and actions by bankers that credibly signal good risk management, including the maintenance of a minimum amount of cash or risk-free assets (Acharya, Mehran, and Thakor, 2013; Bhattacharya, Boot, and Thakor, 1998; Calomiris and Kahn, 1991; Calomiris, Heider, and Hoerova, 2014; Diamond and Rajan, 2001). If bank debt holders are protected by deposit insurance or other guarantees, however, moral hazard can be exacerbated because bank debt holders lose their incentive to monitor and control banks' risk taking (Bhattacharya, Boot, and Thakor, 1998).

A variety of empirical studies have looked at managerial ownership, governance, and risk taking. Anginer, Demirguc-Kunt, Huizinga, and Ma (2013) study an international sample of banks for 2003-2011 and find that stronger formal governance tends to be associated with lower bank

[3] In sufficiently bad states of the world, bankers may also choose to commit fraud or abscond (Calomiris and Kahn, 1991). Gorton and Rosen (1995) argue that, in a state of the world in which industry prospects are declining, managers may boost profits to hide the poor prospects from shareholders.

capital ratios, and that managers with large stakes tend to choose higher bank capitalization ratios.[4] For samples of publicly traded firms more generally, Holderness, Kroszner, and Sheehan (1999) find that, in 1935 and 1995, higher managerial ownership is associated with lower risk.

Following the recent financial crisis, a number of studies have examined the extent to which corporate governance and manager incentive schemes influenced how banks fared during the crisis (Acharya et al. 2009; Berger, Imbierowicz, and Rauch, 2012; Ellul and Yeramilli, 2010; Fahlenbrach and Stulz, 2011; and Senior Supervisors Group, 2008). As Mehran, Morrison, and Shapiro (2011) note, these studies generally find that managers provided with increased incentives to take risk generally did so.

Although some models of risk management focus on conflicts of interest between bankers and creditors, in other models, managerial conflicts of interest affect all sources of outside funding sources. (Examples of the former include Jensen and Meckling, 1976; Myers, 1977; and Merton, 1977, while examples of the latter are Acharya, Mehran, and Thakor, 2013; Calomiris and Kahn, 1991; Holmstrom and Tirole, 1997; and Calomiris, Heider, and Hoerova, 2014. A general review of the issue is John and Senbet, 1998.) Under those circumstances, commitments to improving the bank's corporate governance – for example, the presence of outside directors on the board (directors who are not managers of the bank) or the "bonding" of management – should improve

[4] They find, however, that in 2006, the payoff of risk reversed this effect for managers with sufficiently large stock option wealth. Like Anginer, Demirguc-Kunt, Huizinga, and Ma (2013), Saunders, Strock, and Travlos (1990) find variation over time in the extent to which higher managerial ownership is associated with more or less risk taking. Saunders et al. find that during the period 1979-1982 greater managerial ownership was associated with higher risk, which they attribute to the deregulatory environment. Consistent with that interpretation, Bruno and Claessens (2010) show that legal regimes that are excessively strict can be value destroying; better corporate governance combined with more flexible legal environments can lead to superior outcomes through the ability to undertake value-creating risk.

managerial effort in monitoring and controlling the bank's borrowers, and also mitigate the risk of banker defalcation, which benefits both outside stockholders and debtholders.

Corporate governance policies of banks should arise endogenously, in part to reduce the costs related to the two sets of conflicts of interest in risk taking – that is, the conflict between shareholders and debtholders, and the conflict between managers and outsiders (John and Senbet, 1998, Hermalin and Weisbach, 2003). Understanding how governance policies respond to such conflicts, and what effects ownership structure and governance policies have on risk taking, is highly challenging in the current regulatory environment, in which policies such as deposit insurance, too-big-to-fail (TBTF) bailouts, and legal restrictions on controlling ownership interests in banks, remove the disciplinary incentives of debtholders and limit the ability of equity holders to concentrate ownership (on the effects of TBTF, for example, see Acharya, et. al 2009).[5]

3. Research approach, sample choice, and hypotheses

To understand how ownership structure affects corporate governance, and how ownership structure and corporate governance affect banks' risk management, we examine the links among ownership, governance, and risk management during a period prior to the establishment of a regulatory safety net for banks. During the National Banking Era (1863-1914), government protection was absent, and the latitude for voluntary governance decisions by banks was great. We observe large cross-sectional differences in the ownership structure choices of national banks, as well as great variation in their choices for organizing corporate governance. Banks also structured their portfolios very differently from one another, and displayed important differences in their management of risk – indicated both by balance sheet ratio differences and the differences in bank failure experience during the most severe banking crisis of this era, the Panic of 1893.

[5] The so-called separation of banking and commerce places special constraints on who is permitted to exercise a controlling interest in a bank.

Differences in ownership, governance choices, portfolios and risks, under a common and relatively laissez-faire regulatory environment, make national banks' experiences in the 1890s an ideal laboratory for examining how manager ownership and board oversight are related to rent seeking, portfolio choice, and failure risk. Another advantage of focusing on national banks is that, despite their differences in location, they operated under identical legal constraints. For example, national banks all issued national bank notes and accepted deposits. National banks made loans but were prohibited from undertaking "guarantees" (such as bankers acceptances). Also, unit banking laws restricted each bank to operating only one office, which limited bank size. For all these reasons, national banks' business models were similar (in contrast to today's banking system, in which small banks focus on lending and deposit taking, while global universal banks undertake a much wider range of activities for a quite different customer base).

Corporate governance in the historical U.S. banking context has been the subject of numerous prior studies. One of the most important themes of that literature, which is not present to the same extent in other contexts, has been the connection between stock ownership and the recipients of bank lending. In today's banks, there are strict limits on loans to officers and directors, and it is considered inappropriate to provide better terms to loans offered to officers, directors, or other large stockholders. Historically in the United States, banks often acted as "loan clubs" for insiders, who were often large shareholders with significant formal or informal control rights.

Generally, the literature has taken a benign view of insider lending, arguing that it facilitated value creation and risk management because insiders had strong incentives to screen and monitor one another (Lamoreaux and Glaisek, 1991; Lamoreaux, 1994; Meissner, 2005; Haber and Maurer, 2007; Hansmann and Parglender, 2012; Freeman, Pearson, and Taylor, 2012). Bodenhorn (2013) finds that bank value increased with the number of individual blockholders, but declined with the number of institutional blockholders – that is, blockholders who were not part of the loan club.

Loans clubs increased the value of bank stock because insiders valued preferential access to lending that was attached to their blockholding status.[6]

As we show, national banks, like the state-chartered banks studied by Lamoreaux, Bodenhorn, and others, engaged in large amounts of insider lending. Our data on national banks allow us to investigate how differences that affected ownership and governance rules also affected the amount and quality of insider lending.

The data we use come primarily from national banks' Examination Reports, a source which, to our knowledge, has been little used, and never used for quantitative analysis of the questions we address here. These Reports provide very detailed pictures of the banks and the bank examiners' views about them. They describe the equity ownership of managers and of Board members (and identify whether managers are on the Board). There is substantial heterogeneity with respect to ownership structure among the national banks in our sample. Some managers own a considerable portion of the shares of the bank, while in other cases the managers own only a small fraction. We also have information about a variety of corporate governance measures that could be used to provide oversight of bank managers, such as the frequency of board meetings, the number of outside directors on the board, and whether there was an independent loan review committee that included outside directors. We also know whether the managers were required to post surety bonds, which protected other equity holders in the event of fraud. The reports also provide a fairly detailed picture of the balance sheet, as well as containing the examiner's assessments of various

[6] Interestingly, 19th century corporate chartering rules often employed voting rights rules that reduced the voting power of large shareholders, largely to reduce concentration of control over corporations. Although these departures from one share-one vote rules were common for many firms, they were less common for banks (Hilt, 2008; Hilt, 2013). This may have reflected the desirability of encouraging insider blockholding, as well as the relative absence of the political consequences of control over a bank once banks became chartered freely (roughly around the second quarter of the 19th century).

measures of asset quality, forward-looking expectations of loss, and qualitative evaluations. Thus, we are able to examine the relationship between ownership and governance choices, as well as the impact of both on risk preferences at the bank. The richness of the data permits us to provide an integrated picture of the linkages among ownership, governance, and financial stability.

For our analysis, we gather data from 206 banks from 37 fairly large cities located mainly in the Western and Southern parts of the United States.[7] Those regions saw the greatest financial turmoil and the highest rates of bank failure during the Panic of 1893. By selecting all the national banks from 37 similar cities in these regions we intend to construct a sample of reasonably comparable national banks in terms of their economic environment and lending activities. We combine the information in the Examination Reports with standard balance sheet data from the Call Reports (regulatory reports which contained information on the banks' balances sheets filed about five times a year), as well as other location-specific controls drawn from various censuses and other sources. We examine the banks' situations in the early 1890s, just prior to the Panic of 1893.

This panic is a useful moment to focus upon because it brought the most severe distress for banks of any of the crises during the National Banking Era. That episode resulted in the highest numbers of bank failures of any of the crises, and was one of three episodes during the National Banking Era that witnessed a suspension of convertibility in New York. Although most of the banks

[7] The sample is regionally focused on the West and the South due to our interest in observing how different governance structures fared in the panic of 1893 (which primarily produced bank failures in those regions). Nevertheless, the structures we observe in our sample are similar to what others report for the time. For instance, Bodenhorn and White (2014) find that corporate boards of state chartered banks in New York, a quite different sample, were of similar size to the ones we observe and used similar oversight tools. Hilt's (2014) description of the evolution of corporate boards in the United States from the early 1800s also suggests that the corporate boards in our sample were in line with general practices of the time. Given these similarities, we believe our findings are likely to be generally applicable to banks in the period.

in our sample avoided failure, there was enough failure risk during this episode to provide substantial observable cross-sectional variation – something that is absent during most of the National Banking Era.

We look first at the interplay between ownership and governance by gauging the extent to which the structure of ownership affects banks' choices of corporate governance policies. We hypothesize that higher managerial ownership reduces the extent of formal corporate governance (we label this Hypothesis 1). We treat managerial ownership as an endogenous variable and instrument managerial ownership using managerial turnover events. (See Hermalin and Weisbach (2003) for a discussion of endogeneity issues related to the structure of boards and management control.) The patterns we observe are robust across specifications that weigh different aspects of corporate governance differently, and we report results for a simple score that gives equal weight to each dimension. All five of the formal corporate governance policy choices we consider are mutually positively correlated with one another, and each of them is negatively correlated with the degree of managerial ownership – facts that are consistent with viewing managerial ownership concentration as a substitute for formal governance tools in resolving conflicts of interest between managers and the sources of outside funding for the bank.

Taking into account the endogeneity of governance and ownership structure, we examine the rent seeking behavior of bankers that alternatively choose to solve their governance challenges through concentrated ownership or formal corporate governance policies. We expect (Hypothesis 2) that greater managerial ownership results in greater opportunities for managerial rent extraction through higher wages and loans to managers and also higher dividends (given that managers' interests are closely aligned with shareholders). We find that managers' salaries relative to assets tend to be higher when they own a greater portion of outstanding stock, which reflects their greater ability to extract rents. Interestingly, the *total* proportion of loans made to insiders (officers and outside directors) is not affected by the structure of ownership or governance, but

ownership and oversight have a strong impact on which insiders receive those insider loans. When managers have greater equity ownership, more inside loans are allocated to them; when outside directors exercise greater oversight in corporate governance, a greater proportion of the inside loans are received by them. Greater managerial ownership also results in higher dividends.

We also connect ownership structure and corporate governance choices to banks' risk preferences and their balance sheet choices. In particular, we show how ownership and governance affected bank portfolio structure, performance, and failure probabilities during the Panic of 1893. We hypothesize that, as the result of risk aversion, greater managerial ownership (which reduces the diversification of managerial wealth) results in lower bank risk taking (Hypothesis 3).

Our results on risk taking indicate that managers who own a greater proportion of the bank's stock take less risk according to any measure of risk we employ. For example, with respect to forward-looking measures of risk, managers with large equity stakes in their banks are less likely to rely upon high-cost "borrowed funds" and are also less likely to be involved in real estate lending. Both activities were perceived by contemporaries as indicative of high risk and such perceptions are generally borne out in the Panic. Moreover, we find that an outside estimate of the riskiness of the bank's overall portfolio, the forecasted losses anticipated by the bank's examiner, paints a similar picture; greater management stakes are associated with lower expected losses. We view these results as consistent with the idea that managers with a larger share of their wealth invested in the bank were more risk–averse in their risk management practices. Banks that chose lower managerial stakes and more formal governance policies tended to undertake greater levels of risk. That finding is consistent with the view that outside directors, who represent the interests of diversified outside equity holders, prefer a slightly higher level of risk. The preference for lower risk appears to have been beneficial during the Panic of 1893 as we find that banks with higher

manager ownership and less reliance on formal corporate governance were less likely to fail. This effect is due largely to how these banks structured their balance sheets.

Banks seeking to reduce the risk of default on their debts can use two alternative risk management tools in combination: a higher cash-to-asset ratio (on the asset side of the balance sheet), or a higher equity-to-asset ratio (on the liability side of the balance sheet).[8] We hypothesize (Hypothesis 4) that banks with greater managerial ownership and less reliance on formal corporate governance will choose to rely more on cash asset holdings to reduce their default risk because holding cash compensates for the absence of outside oversight of risk management in ensuring proper managerial risk management (Calomiris, Heider and Hoerova, 2014). In some states of the world – if hidden losses are large, making resulting managerial stakes unobservably small – managers may prefer to undertake more risk than outside shareholders and depositors (e.g., when managerial effort at limiting risk is costly). For that reason, the absence of formal corporate governance oversight of management may give rise to the need for more cash holdings, as a way to preserve the credibility of risk management during bad times.[9] Banks that lack formal governance

[8] All national banks were chartered with double liability required for stockholders. That meant that stockholders could be assessed for an additional amount equal to the paid in capital of the bank if the bank were placed into receivership. Consequently, the actual amount of equity that acted as a buffer against loss, from the standpoint of bank depositors, was more than the amount of paid in capital and accumulated retained earnings. To take account of double liability's effect on bank risk, we experimented with including the ratio of paid in capital to total net worth in our regressions. We find that this variable was not statistically significant, and its inclusion did not alter our other findings. In the results reported here, we exclude it.

[9] This result relies on the fact that cash deposits in other banks, unlike equity (which is an accounting category subject to manipulation), are observable (and were actually verified by examiners), and most importantly, cash deposits are not subject to risk shifting by the bank that possesses them. The relative reliance on cash or equity may also reflect adverse-selection costs of issuing equity (as in Myers and Majluf 1984). Calomiris and Wilson (2004) show that banks prefer less on equity when they face higher adverse-

will suffer from greater asset substitution risk, and greater adverse-selection problems (if they were to attempt to raise additional sources of outside equity). Greater asset substitution risk from a lack of formal governance therefore will tend to lead banks to rely more on cash as a means of signaling good risk management practices.[10] We find that banks with higher managerial ownership concentration relied more on cash assets, and less on equity.

To facilitate the exposition of the various tests of these four hypotheses, Table 1 summarizes them and the tests we perform in our empirical work. The remainder of the paper is organized as follows. Section 4 discusses the data sources and the sample. That section also explains the construction of our corporate governance measures and the variables we use as indicators of rent seeking and risk preferences. The baseline empirical analysis is contained in Section 5 while a variety of robustness checks are presented in Section 6. Section 7 concludes.

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selection costs of raising equity in the market. As in the case of risk management incentive problems, adverse-selection costs of equity issues also imply a greater reliance on cash. Furthermore, we expect problems of asymmetric information to be mitigated by the use of board oversight. Board meetings, a loan review committee, and bonding should be associated with greater transparency and hence lower costs of equity offerings. Although we believe that asymmetric information mitigation was an additional benefit of formal corporate governance, we do not emphasize this channel in our empirical cross-sectional analysis because of the absence of equity offerings for all the banks in our sample, which indicates that differences in adverse-selection costs are unlikely to explain cross-sectional differences in banks' use of cash.

[10] Using rules to require banks to hold a portion of their assets as cash to control asset substitution risk is the main theoretical conclusion of Calomiris, Heider and Hoerova (2014). Acharya, Mehran, and Thakor (2013) also suggests that forcing banks to hold a stock of safe assets (such as Treasury securities) is useful for controlling risk-shifting incentives, although they suggest that such holdings should be proportional to equity rather than total assets. Most previous work tended to focus on the use of capital to manage incentives with cash and safe assets viewed as related only to liquidity management (see, for instance, the discussion in Bhattacharya, Boot, and Thakor, 1998).

4. Data sources and variable definitions

We gather a variety of information on individual banks using Call Reports and Examination Reports. Here we describe the data sources and the definitions of the variables used in this study.

4.1. The sample

Our sample contains 206 banking institutions, which consists of all the national banks located in 37 cities. As we used information from both the Call Report and examiner reports, and will ultimately be interested in how banks fared during the Panic of 1893, we need banks to have both reports available prior to the Panic. Thus, to be included in our sample, the banks needed to have provided information for the September 1892 Call Report and to have had at least one Examination Report completed prior to May 1893 (the onset of the Panic). Those are the Reports that provide the information used for the analysis.[11]

The 37 cities include many of the larger ones in the Western and Southern parts of the United States.[12] A number of them were designated as "reserve cities" for purposes of regulatory cash reserve requirements. Deposits held at banks in reserve cities could count as part of a "country" bank's legal reserve and these deposits often served as part of the regional payment system (see James 1978 for further detail). Some of the other cities, even though they were not

[11] Two banks file the September 1892 Call Report but close prior to May 1893. For these institutions, we use the examination report nearest closure, so long as it was filed at least four months prior to closure.

[12] The cities are: Birmingham, AL; Mobile, AL; San Diego, CA; Los Angeles, CA; Denver, CO; Pueblo, CO; Indianapolis, IN; Des Moines, IA; Dubuque, IA; Lexington, KY; Louisville, KY; New Orleans, LA; Minneapolis, MN; Rochester, MN; St. Paul, MN; Stillwater; MN; Kansas City, MO; St. Joseph, MO; Helena, MT; Lincoln, NE; Omaha, NE; Albuquerque, NM; Fargo, ND; Cincinnati, OH; Portland, OR; Knoxville, TN; Memphis, TN; Nashville, TN; Dallas, TX; El Paso, TX; San Antonio, TX; Salt Lake City, UT; Spokane, WA; Tacoma, WA; Milwaukee; WI; Racine, WI; and Cheyenne, WY.

technically reserve cities, were important enough regionally that other banks held deposits there. Thus, many of the banks in our sample played important roles as intermediaries in interbank markets. Nevertheless, our sample includes a number of banks from smaller cities as well.

4.2. Primary data sources

The Examination Reports provide a wealth of information.[13] The most vital material for our purposes is the detailed information regarding the extent of ownership by the bank's management and its board, as well as the information about corporate governance practices. The Examination Report lists all the bank directors and major officers (President, Vice-President, Cashier), the number of shares held by these individuals, and any loans to these individuals. Salaries of the officers were noted and whether the officers were required to put up a surety bond. The examiner also commented on whether the board exercised any oversight of the officers.

The Examination Reports also considered a variety of aspects of the balance sheet beyond what was covered by the Call Report. That information included additional quantitative detail about the loan book, such as the amount of loans that were demand or time loans, the amount of loans secured by real estate, and the amount secured by other collateral.[14] There was also information on the bank's liabilities including additional detail on whether the bank borrowed from other banks (a form of higher-interest, short-term, "hot" money).

Finally, the examiner provided information on bank performance, which combined hard facts about the bank with his own judgments. Specifically, the examiners evaluated the quality of

[13] Calomiris and Carlson (2014) provide a detailed summary of the contents of the Examination Reports. See also Robertson (1995) for more information on the examination process.

[14] Although real estate lending was "prohibited" by national banks, national banks nonetheless found ways to lend against real estate. A loan made without real estate as collateral could become collateralized by real estate if the creditworthiness of the borrower deteriorated.

the loan book by listing the volume of slow and overdue loans and providing an estimate of expected losses on the banks' assets – which included loans, as well as other assets. The examiners also noted the amount and date of the most recent payment of dividends, as well as whether funds that were retained would cover current and future losses or build up the bank's net worth.

For most of our balance sheet data, we use information from the September 1892 Call Report. While some additional information is available on the Examination Report, the Call Report has the advantage of providing data for all the banks at the same point in time, which reduces concerns about spurious differences due to seasonal or other time-related factors.

We also include a number of variables related to the economic environment in which the bank operated. These include county level variables from the various censuses, such as population and the share of income from agriculture.

All variables, their definitions, and their sources appear in Table 2. Summary statistics for these variables appear in Table 3.

4.3. Ownership and governance variables

The individuals most responsible for running the bank were its senior managers, in particular the president, vice-president, and cashier (essentially, the chief operating officer of the bank). They played a large role in making loans and arranging the funding of the bank. These individuals tended to own shares in the bank and were frequently also on the board of directors (the President of the bank was required by law to serve on the Board). A key variable in our analysis is the share of the bank's stock owned by the officers of the bank. We focus, in particular, on the fraction of outstanding bank shares owned by the president, vice-president, and cashier.[15]

[15] We obtain the number of outstanding bank shares by dividing bank capital by 100 (as bank capital was typically carried at book value based on share prices of $100 per share). In a few cases the examiner indicated the number of shares outstanding and these reports confirm that our procedure is correct. In a few

The average portion of shares owned by these three officers, as reported in Table 3, was 25 percent. The histogram in Figure 1 provides a better indication of the distribution of managerial ownership. At many banks in the sample, ownership by the managers is fairly modest; the three top managers owned less than 6 percent of outstanding shares for about 30 percent of the sample. There are also cases of significant ownership concentration; the top three managers owned at least half the outstanding shares in nearly 10 percent of the sample.

The behavior of managers could be constrained by the Board of Directors. Boards ranged in size from 4 members to 23 members. While the President of the bank was always on the Board and other bank officers frequently sat on the board, the majority of the board members consisted of outside directors—individuals that were not officers or other employees of the bank. Some outside board members owned significant stakes in the bank. A number were prominent businessmen that might provide business to the bank.[16] A histogram of ownership by outside directors is shown in Figure 2. The average portion of shares owned by outside directors was 15 percent but it reached as high as 57 percent. Presumably, the larger the portion of shares owned by the outside directors, the more they could influence the behavior of managers. The ownership by all other individuals is shown in Figure 3. As can be seen from this figure, individuals who are neither managers nor bank managers own a majority of the shares in about two-thirds of the banks in our sample.

There were also other ways that the Board could exert control over managers. The bank could maintain an active independent discount committee (defined by regulators as one containing at least one outside director to review and approve loans proposed by the managers). Such a committee was maintained by 60 percent of banks. Another way of exerting control was by meeting frequently. Boards that met infrequently, such as semi-annually, presumably exerted little

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other cases the examiner reported that the value of capital had previously been written down and shares revalued. We believe that we have made all the appropriate corrections for these write-downs.

[16] For instance, a Mr. Proctor and a Mr. Gamble served on the board of the Citizens National in Cincinnati.

influence. The board met monthly or more frequently in nearly two-thirds of the banks in our sample. In cases in which the managers comprised a significant portion of the board, there was presumably little independent oversight; when outside directors dominated the board, they could presumably exert more control. In our sample, the median portion of the board that consisted of outside directors was 71 percent; we create an indicator variable equal to one when the portion of directors are outsiders is above the median and is zero otherwise. Our measures of the reliance on independent directors, of the existence of a loan review committee, and of the frequency with which it met are similar to other measures used to analyze corporate risk management in modern financial institutions, such as the "active board risk committee" of Ellul and Yerramilli (2010).

Another way of influencing bank management was requiring managers to post surety bonds. These bonds would offer the directors (or receiver) a way of recovering funds in the event the manager committed some specified act, typically some type of fraud that caused losses to the bank. Bonds could be personal or provided through a surety bond agency (which often required that the person being insured post some type of collateral).[17] Surety bonds were most often required for the cashier, who oversaw the books and for whom the possibility of fraud was therefore highest (nearly 60 percent of cashiers posted bonds). Other managers also were required to post such bonds (the President posted a bond in 33 percent of our sample and the vice-president did so in 12 percent of the sample).

In Figure 4, we illustrate the relationship between manager ownership and one of the indicators of corporate oversight: the fraction of the Board consisting of outside directors. The negative relationship between these two measures indicates that more manager ownership tends to be associated with less formal oversight (Hypothesis 1). Moreover, not only are each of the measures of Board oversight negatively correlated with manager ownership, as shown in Table 4, but they are all positively correlated with each other. Although we investigated the impact of each

[17] For more information on surety bonds see Lunt (1922).

of these measures of Board control on managerial behavior, it is useful for our purposes to create an index that aggregates the different measures into a single corporate governance index. We do so by summing the five indicator variables.[18]

The combined governance score is strongly negatively correlated with the management ownership share, and the partial correlation between those variables is large and statistically significant even in the presence of many control variables, as shown in Table 5, which reports an OLS regression that treats corporate governance as the dependent variable. Of course, ownership share is not exogenous and, therefore, Table 5 does not permit a structural or causal interpretation. We return to estimate the joint relationship among ownership share, governance, and other endogenous variables below.

Examiners seem to have understood that banks could achieve good management of risk with or without active oversight of management by the Board. Below are excerpts from the Examination Reports of two banks, one with the minimum corporate oversight score of 0 and the other with the maximum score of 5. In neither case did the examiner have concerns about the management of the bank or the soundness of the bank, even though the examiner was aware of the clear differences in the oversight being exercised by the Board.

Oversight score of 0 - Comment on the Board:

> Frequent meetings are not held by the directors of this bank and records only show that formal meetings are held to declare dividends. No mention being made of their having examined or approved loans and discounts at such times, and there is no report of discount and examining committee having acted. The management is apparently with Mr. Gates, the president of the bank.

Comment on the Officers:

> Officers are capable, prudent and of good reputation and their management is efficient and successful, that management being in the hands of Mr. Henry Gates the

[18] We also tried aggregating the five indicators by taking the first principle component, similar to Ellul and Yerramilli (2010). All the five indicators had positive and roughly equal weights. Thus, the first principle component was not so different than the simple average so we stick with the average for simplicity.

president who has had over 30 years experience in the banking business in this city. No bonds required.[19]

Oversight score of 5 - Comment on the Board:

Directors meet monthly. Minutes full and explicit. Have discount board and examining committee. Discount board pass[es] upon all loans.

Comment on the Officers:

Officers are capable, prudent, of good reputation. Their management successful; the bonds are furnished by Louisville Bond Co. and in custody of Lexington Trust.[20]

4.4. Financial and portfolio measures

A number of measures are potentially of interest as controls in our regressions analyzing ownership, governance and risk management, while others serve as endogenous variables that we analyze (i.e., the cash assets ratio and the equity-to-assets ratio). Two potential control variables are bank size and bank age. Smaller banks, ceteris paribus, generally will be more closely held either because of limited bank manager wealth or because of fixed costs in establishing formal governance procedures. The problem with using bank size as a control variable, however, is that size is itself an endogenous variable that is likely to reflect choices that are correlated with the endogenous variables being analyzed. For example, as we show in the appendix, in a simple model of risk management effort choice, for a given level of managerial wealth, the maximum size of the bank will be constrained unless the bank adopts formal corporate governance tools. Thus, rather than including asset size in our regressions, we include the population size of the city in which the bank is located, which is an exogenous influence on bank asset size that is not affected by corporate governance choice.

Bank risk management practices may also reflect heterogeneity in bank goals or experience. Young banks may lack experience, or may have different preferences or more limited opportunities.

[19] Examiner report of November 14, 1892 for the Nebraska National Bank of Omaha, NE, charter 2665.

[20] Examiner report of August 18, 1892 for the Fayette National Bank of Lexington, KY, charter 1720.

To capture any or all of these influences, we control for bank age. Our measure is the log of the number of years since the bank was established (this could be the date the bank became nationally chartered, or the date it was founded, depending on whether it was a conversion of a state bank).[21]

We have considerable information about asset portfolios. Loans were obviously a relatively risky asset but also a relatively high-earning asset. One basic and often-used asset ratio that captures both risk and earning potential is the share of assets consisting of loans. The Examination Reports provide additional information about the loan portfolio. During the National Banking Era, real estate loans were considered riskier loans. National banks were not supposed to originate mortgages; however, they were allowed to have mortgages loans if the real estate was being used to collateralize a previously existing loan. Thus, we employ real estate loans relative to total loans as a measure of lending risk. We are also interested in the degree of insider lending. We construct two measures: the share of all loans that are made to insiders (whether board members or managers) and the share of loans to insiders that are made to managers rather than outside directors.

Previous research on bank risk management has identified the proportions of different types of bank debts as an important indicator (Calomiris and Mason, 1997; 2003; 2008; Calomiris, Mason and Wheelock, 2011; Carlson, 2010). A bank's liability structure may reflect exogenous liquidity risks faced by banks (e.g., a higher proportion of checking deposits). Liability structure also may capture endogenous changes in the composition of debts in reaction to changes in unobserved characteristics of banks' asset risks (e.g., banks that rely on borrowed funds may find it hard to raise funds from other sources), and we include reliance on high-interest rate borrowed

[21] Age turns out to be a highly significant control variable in many of the regressions reported below, although its interpretation is not obvious. In the regressions reported below, greater age is associated with higher managerial ownership and lower formal governance, with lower default risk, with lower use of equity and greater use of cash, and with lower managerial salaries and higher dividends.

funds as an endogenous variable in our analysis as an indicator of risk.[22] In some specifications, we include the proportion of liabilities consisting of individual deposits and the proportion of deposits in checking deposits, as opposed to savings or time deposits, as controls.

We have some potentially useful information about the earnings and expenses of the banks in our sample. One of the expenses listed in the Examination Reports is the salaries paid to managers. As larger banks tend to pay higher salaries, we scale salaries by the assets of the bank. We also observe dividend payments. We analyze dividends as a dependent variable; high dividend payments are sometimes viewed as an indication of a disciplined corporate governance environment. Of course, dividends also reflect differences in profitability; that is, they may be used to signal management's belief that earnings will persist. Also, dividend payment differences may reflect different growth opportunities; retaining profits raises the amount of equity invested in the bank, which ceteris paribus, lowers the bank's default risk, and thus increases the capacity of the bank to grow its assets. To analyze dividend payouts, we consider the ratio of dividend payments relative to shares outstanding if dividends were paid during the past six (banks typically paid dividends semi-annually, in June and December). As an alternative, we also looked at whether the bank paid out dividends during the past six months and obtained fairly similar results.

4.5. Risk

We consider several indicators of contributors to the default risk of the bank. Some of these are items noted earlier, such as making real estate loans or relying on borrowed funds. We also use an outside expert's view on the quality of the assets. The examiners provided estimates of likely

[22] Often this borrowing took the form of rediscounting notes or having bills payable, but could also take the form of collateralized certificates of deposit. While the former are noted on the Call Report, the latter type is noted only in the Examination Reports. As the amounts are not always noted, we instead use an indicator for whether or not the bank made of this "hot" money.

losses on assets (not just loans but on securities and other items as well, such as non-income generating assets such as furnishings) and we use the forecast of losses related to assets as a measure of risk. We also measure default risk based on outcomes, in particular whether the bank was forced to close its doors between October 1892 and December 1893.

The two primary tools of risk management for banks were the equity-to-asset ratio and the cash assets-to-total-assets ratio. Equity, or net worth, is measured as the sum of paid in capital plus cumulative retained earnings held as surplus or undivided profits. There were no equity ratio requirements, although banks were required to maintain minimum amounts of capital and surplus. Estimating the demand for cash assets is complicated by the legal minimum requirements of cash relative to deposits. Cash reserve requirements specified a certain level of cash and deposits in reserve city banks relative to deposits and net due to banks. As we find in our analysis of reserve holdings, however, regulatory constraints on holdings of cash reserves (discussed in more detail below) did not appear to be binding on banks' demands for cash assets.

4.6. Other controls and instruments

We also include a number of variables to control for local conditions. As noted above, we include the population of the city as reported on the 1890 census. At the county level, we gather other information from the 1890 census on the economic environment, including for example, the share of county income from agriculture. At the state level, we include an indicator for significant (greater than $1 million in 1891) gold and silver mining in the state as reported in the 1892 Statistical Abstract of the United States, and also for whether the state achieved statehood at an early date. In incorporating such influences, we imagine that corporate governance practices may be influenced by sectoral composition and by the maturity of the local economy.

As we discuss further below, we employed two potential measures as instruments for ownership structure and governance choices. Our first, and primary, instrument is an indicator

variable capturing a change in the identity of the president of the bank, which we identified using the Examination Reports. We investigate the causes of managerial turnover by searching online newspaper and other sources for information about the circumstances that gave rise to those changes. The second instrument is the log of the number of other banks (national, state, savings, and private) operating in the same city as the subject bank. This second instrument is used only in some robustness tests described below. We consider the exclusion restriction for this second instrument as more controversial, and thus we do not include it in our baseline specifications.

An important feature of the banking system during the National Banking Era was the system of interbank depositing of reserves. National banks were required to hold cash and interbank deposits against their own deposit liabilities. Banks outside major cities need to hold a 15 percent reserve, three-fifths of which could be held as deposits at banks in larger "Reserve" cities or, "Central Reserve" cities—New York, Chicago, or St. Louis. Banks in Reserve cities needed to hold a 25 percent reserve, half of which could consist of deposits in a "Central Reserve" city. Deposits in New York played a key role in the settling of interregional payments. Many banks held deposits with banks in New York. Moreover, banks in New York provided a substantial amount of interbank loans through rediscounting. To capture the potential importance of proximity to New York in affecting banks' risks and operations, we include the log of the distance of banks from New York as a control. We also include an indicator for whether the city in which the bank is located is a reserve city, to capture the possible effects of differences in interbank relationships and reserve requirements on bank behavior.

5. Analysis

We are interested in how exogenous bank circumstances influence ownership and corporate governance choices, and related bank behavior, as described in our four Hypotheses in Table 1 and our theoretical discussion of those hypotheses above. As these variables are clearly

inter-related, we start by presenting our approach to identifying the linkages among ownership structure, governance choices, rent seeking, and risk management. We then review our findings.

5.1. Inter-related ownership and corporate governance measures

Our initial empirical approach to identifying the effects of ownership and governance choices on bank behavior employs a two-step procedure, which treats ownership structure and corporate governance practices as endogenous. For most of the variables we analyze, we instrument either managerial ownership or corporate governance score using events associated with managerial turnover.[23] We expect (and find in Table 6) that a managerial turnover event (such as the death of a bank president) is associated with a reduction in the managerial ownership share of the bank and an increase in corporate governance.

To verify that managerial turnover is traceable to exogenous events, we performed web-based searches, and also searched through newspapers available through the various digitized search engines maintained by the Library of Congress, to find information about the changes in bank presidents between 1882 and 1892 for banks in our sample. We used both the bank names and the presidents' names to obtain information about the reason for managerial turnover. Because the sources covered by these digital databases tend to be biased toward larger cities' newspapers and national publications, we were not able to find information about many of these management changes. For the 137 relevant turnover events in our sample, we find information explaining the reason for the management change for 37 of the events. For 65 of the events for which information was lacking, we were unable to locate any newspapers for the relevant time period and location. For 35 of the events for which information was lacking, local newspapers for the relevant time period were available, but we were unable to find any story about the changes in bank presidents.

[23] As we explain further below, for some variables of interest, managerial turnover does not satisfy the exclusion restrictions for a valid instrument.

Managerial turnover generally was associated with clearly identifiable exogenous events. In the 37 cases we were able to trace, the causes of turnover included death or severe illness (23 cases), election to public office or other new career opportunity (9 cases), retirement (2 cases), and other apparently exogenous circumstances (one departure in the wake of a cashier embezzlement, one because of business problems unrelated to the bank, and one because the president declined re-election). We also checked for notable changes in the condition of the banks as indicated by changes in the capital stock around the time the president changed. We find no evidence that changes in capital systematically preceded, followed, or were coincident with turnover. In our regressions, the turnover instrument is measured as the number of times the President of the bank changed between 1882 and 1892. In addition to reporting IV results, we also report non-instrumented OLS or probit results for purposes of comparison, which provide estimates interpretable only under the assumptions that managerial ownership and corporate governance choices are exogenously given with respect to the other endogenous variables we analyze.

5.2. Corporate governance, balance sheet composition, and risk taking

We begin our analysis of Hypothesis 3 in Tables 7 and 8 by focusing on measures of risk from the liability side of the balance sheet. With respect to the composition of liabilities, we examine bank reliance on the use of borrowed funds, which previous research has shown is a forecaster of bank distress (Calomiris and Mason, 1997; 2003; Carlson, 2010). Borrowed funds were more expensive and had to be secured; use of these funds suggests a greater level of risk. Due to data limitations in tracking the exact amounts of borrowed funds, we use a probit specification to test whether our ownership or governance variables are associated with the use of such funds. We find, in Table 7, that banks in which managers are more significant owners are less likely to rely on borrowed funds from other banks. That result holds both for simple probit and IV specifications. The simple probit result indicates that an increase in the management ownership share of 10 basis

points, roughly half a standard deviation, would have reduced the probability of borrowing by 0.05, a fairly substantial effect. The results for corporate governance have opposite sign, as expected; exogenous increases in formal corporate governance are associated with higher use of borrowed money (here the IV results are statistically significant but the simple probit results are not).

To economize on the reporting of other results relating to risk choice, our subsequent findings for three other endogenous variables measuring risk are summarized in Table 8, which omits reporting the various control variables and focuses on the key coefficients of interest (the relationship among managerial ownership, governance score, or their instrumented values, and the other variables of interest). These results corroborate the results for borrowed money.

With respect to using measures of risk based on the asset side of the balance sheet to test Hypothesis 3, we consider the composition of loans. As noted earlier, real estate loans were generally considered to be riskier and were forbidden by the National Bank Act, but banks could use mortgages to secure debts previously entered into. As shown in Table 8, when management owns more shares in the bank, the bank tends to have fewer mortgages on its books. This finding is statistically significant both in a simple Tobit regression as well as using IV. The Tobit coefficient indicates that a one standard deviation increase in ownership would have decreased real estate loans as a share of total loans by 1.2 percentage points, a sizeable decrease given that, on average, real estate loans only accounted for 3.6 percent of lending. Governance score (whether instrumented or otherwise) has the opposite sign, as expected, but is not statistically significant.

We also consider the examiner's assessment of asset problems, measured by the estimated losses on assets relative to total assets. We report in Table 8 that greater ownership by management is associated with lower values of that measure. A one standard deviation increase in ownership is associated with a reduction in estimated losses to assets of about 0.7 percentage points – a considerable reduction given that losses averaged on the order of 1.2 percent of assets. The IV specification, however, is not statistically significant.

Interestingly, there is a negative association between governance score and estimated asset loss in the non-instrumented specification. The examiner reports provide a breakdown of sources of expected losses or necessary write-downs (such as loan losses, security losses, building valuation, etc.). We analyzed the composition of expected losses and find that higher expected losses/write-downs related to the category "fixtures and furnishings" are the primary contributor to the greater expected losses of banks that display low managerial ownership and low corporate governance score. That result is intuitively appealing: excessive expenditures on furnishings are a wasteful, value-destroying use of funds that would not be chosen in a disciplined environment.

With respect to bank survival, Table 8 reports that increased ownership by management is associated with a reduced likelihood that the bank closes between October 1892 and December 1893 (the bulk of the closures occur during the Panic of 1893). When managers had a greater ownership stake, they took less risk and were thus less likely to succumb. Greater use of formal corporate governance creates more tolerance for failure risk.

We now turn to the question of how ownership and governance structure are related to greater or lesser reliance on particular tools of risk management (Hypothesis 4). The default risk of a bank is mainly determined by three variables: the riskiness of the risky assets (loans and other risky assets), the ratio of (riskless) cash assets to total assets, and the ratio of equity to assets. Less risky loans, a higher ratio of cash assets, or a higher equity ratio all contribute to lower risk. Banks can tradeoff among these three measures to target the desired level of default risk on their debts.

Of course, in estimating the reliance on cash, other factors are relevant and must be controlled for. In particular, the structure of deposits has implications for liquidity risk—a bank that is more reliant on checking accounts than savings accounts for its funding will probably need to hold more cash, ceteris paribus. Thus, we include additional controls in our analysis of the

choices of cash and equity, in particular the ratio of individual deposits to total liabilities and the ratio of checking deposits to all individual deposits.[24]

The results, presented in Tables 9 and 10, show that banks with greater managerial ownership prefer to make greater use of cash and less use of equity capital to target their default risk. At banks that had more board oversight of management, capital ratios were generally higher and cash ratios tended to be lower, consistent with the hypothesis above. A one standard deviation increase in management ownership is associated with a reduction in the net worth to asset ratio of about 3.5 percentage points (the mean ratio was 33 percentage points) and an increase the cash to asset ratio of 0.5 percentage points (the mean ratio was 8 percentage points). These are economically meaningful magnitudes.

5.3. Corporate governance and insider rent seeking

Here we explore Hypothesis 2 – whether managerial ownership and formal governance are related to insider rent seeking. In particular, we look at officer salaries, lending to insiders, and (lower) dividend payments as ways that insiders might seek to extract value from the bank.

[24] As noted earlier, banks in Reserve Cities were required to hold more cash relative to deposits than other banks. We therefore include an indicator variable for whether the bank is located in a Reserve City. The results indicate that being in a Reserve City did boost cash holdings slightly. Finding only a modest effect is consistent with Carlson (2015) who finds that cash holdings were not very different between banks in larger country cities and banks in the reserve cities, as the buffers held by the country banks were substantial. Moreover, he finds that it was not uncommon for banks to hold less cash than required, which suggests that the reserve requirements were not strongly binding. For these reasons, the simple dummy variable control in the regression is likely sufficient.

The OLS results, shown in Table 11, are consistent with that idea and indicate that when the managers own more shares, they tend to pay themselves higher salaries, and when governance score is high, managers receive lower salaries.

We do not report IV results for managerial salaries because we do not believe that the necessary exclusion restrictions are satisfied for using the turnover instrument in the salaries regression. Turnover of management is likely to have a direct positive effect on managerial salaries, because the need to hire a new bank president is likely to require attracting candidates to the bank quickly, sometimes from a distance.

Another way of extracting rents from a bank is for the owners to lend to themselves to finance their outside projects. There has been considerable prior academic analysis of this issue, which indicates that insider lending is not always value-destroying or risky (Lamoreaux, 1994; Haber, 1995). We look at two variables related to insider lending. The first is the amount of loans made to all insiders (board members and management) relative to all loans. The second is the proportion of all insider loans going to managers.

Interestingly, in regressions not reported here, we find that neither managerial ownership nor Board oversight are associated with the total proportion of insider lending (defined to include loans to both managers and directors). We do find, however, that ownership and governance structure strongly influence who receives those insider loans (Table 12). At banks in which the management owned a greater proportion of the stock, a greater fraction of insider loans went to the management. A one standard deviation increase in management ownership increased the insider share of loans going to managers by 7.5 percentage points. Given that officers, on average, received 37 percent of insider loans, this effect of ownership is considerable. When there were more corporate governance controls, more of the insider loans were made to the outside directors.

With respect to dividends, we find, in the OLS results reported in Table 13, that when more shares are owned by managers, dividend payments are higher. While this finding is consistent with

the idea that institutions with higher managerial ownership provide greater payouts to owners, it is also consistent with the idea that these institutions are more profitable. We do not report IV results with respect to dividend payment because, as in the case of managerial salaries, we do not believe that the exclusion restrictions for the instrument are satisfied. To the extent that managerial turnover has a temporary effect on bank performance, it may affect dividends directly.[25]

Taken together, our results regarding salaries, insider lending, and dividend payments are consistent with Hypothesis 2. When managers own a greater fraction of the equity shares of the bank, they extract greater rents from the bank through higher salaries and more loans to themselves, although managers prefer higher dividend payments, which they, as major stockholders, benefit from. Similarly, the results on governance scores show that stronger oversight by the Board of Directors tends to be associated with less rent extraction by the managers but somewhat greater extraction by the outsiders on the Board (insider lending became directed more toward the outsiders on the Board).

5.4. Corroborating anecdotal information

In the previous sections, we find that high management ownership is associated with safer asset portfolio choices, low management ownership is associated with riskier portfolios and manager rent seeking, and strong corporate governance appears to reduce rent seeking. These

[25] The National Banking Act prohibited banks from paying dividends if they were experiencing losses that exceeded their undivided profits (i.e. losses that would erode the bank's surplus). As we noted earlier that both banks with greater management ownership and with stronger governance have lower losses, we might have expected both ownership and our governance measure to increase the likelihood of dividend payments. That we find greater insider ownership increases the likelihood of dividend payouts but more formal governance does not suggests that our results mainly reflect managerial behavioral differences rather than exogenous differences in profitability.

finding are consistent with anecdotal information in the examiner reports. For example, in one bank with high ownership and strong governance, the examiner reported that: "This is a very conservative bank and loans and discounts only where they believe that they are perfectly safe. I can discern no poor paper in the bank.[26]"

Moreover, we find examples of examiner expressions of concern about banks with low manager ownership and low governance scores:

> Its capital is badly impaired…It is shameful and wicked that so much money should be fooled away in so short a time and prove the folly of having real estate speculators as managers of banking institutions.[27]

and

> The general condition of the bank is good excepting that the officers are using too much of the bank's money without security, loaning too much to the Bank of Everett and using too many devices to make a good showing.[28]

These are particularly apt examples of the sorts of behaviors we identify in the empirical analysis. More generally, in reviewing the anecdotal information, we find that there tended to be more concerns about banks with low management ownership and low governance and few concerns about banks with high ownership or governance.

6. Robustness and extensions

Here we discuss a variety of robustness checks and extensions of the baseline analysis.

6.1. Considering interactions between ownership and governance choice

Our first extension is to re-run our regressions, allowing both stock ownership structure and corporate governance to enter as endogenous variables in the same regressions. The IV results

[26] Examiner report of January 7, 1893 for the Lumberman's National Bank, Stillwater, MN, charter 1783.

[27] Examiner report of December 28, 1892 for the Washington National Bank of Tacoma, WA, charter 4018.

[28] Examiner report of March 1, 1893 for the Columbia National Bank, Tacoma, WA, charter 4623.

reported thus far treat the two endogenous variables as alternative measures, reflecting our view that concentrated ownership and formal governance are alternative means of ensuring good management, and that they are negatively correlated choices. To consider possible interactions between the ownership concentration and formal governance requires the identification of a second instrument. One candidate is the degree of competitive pressure faced by the bank, which we capture with the number of other banks (national, state, savings, and private) operating in the same city as the subject bank. Although using both managerial turnover and competitive pressure resulted in qualitatively encouraging first- and second-stage results, the instruments were not powerful enough to yield statistically significant effects in second-stage regressions that included both ownership concentration and formal governance choice as endogenous variables, and we do not report those regression results here.

As a simpler approach to investigating the interactions of ownership concentration and governance choice, we divide banks into four groups, using a two-by-two matrix that measures each bank's combination of managerial ownership and formal corporate governance score. The four groups are defined as (1) high-managerial ownership and high-formal governance score banks, (2) high-managerial ownership and low-formal governance score banks, (3) low-managerial ownership and high-formal governance banks, and (4) low- managerial ownership and low-formal governance banks. This approach also helps assure us that our earlier results were not driven by outliers in our concentration measure. Our findings for these groups are reported in Table 14.

As expected, the fourth group (which lacks either a high degree of managerial ownership or formal governance) is riskier than the other three. This group was more likely to use borrowed funds, more heavily invested in real estate loans, and had greater expected losses than the other groups. Furthermore, these banks display higher operating costs, which a more granular analysis shows is the result of unusually high spending on bank furnishings (a form of managerial perquisities).

Several other findings are also consistent with our earlier results. For instance, the ratios of managerial salaries to assets and of loans to managers relative to all insider loans are significantly greater at banks in which management ownership is higher and formal corporate governance is lower compared to banks with low managerial ownership and high formal governance. The average ratio of cash to liabilities is higher when formal governance is low. Net worth to asset ratios are lower for the two groups with high management ownership than the other two groups.

6.2. Different components of governance score

We also examined the separate role of each of the components of the governance score used above. Specifically, we tested whether our results relating to the corporate governance score are driven by one or two of the five individual indicators by repeating the regressions, replacing the score variable with each component in turn. In many cases, we find that the coefficients on the individual components tend to point in the same direction, which suggests that the overall results are indeed driven by the summation of these different measures. For example, we find that the reduction in losses relative to assets is most strongly associated with having an active discount committee and with having a bonded cashier; the relationship with the other governance measures also point in that direction but the effects are smaller. Most other variables behave similarly.

For a few measures, the relationship between oversight and outcomes is more complicated. For the use of borrowed funds, having the board meet monthly or more frequently, having a relatively high portion of the Board consisting of outside directors, and requiring a bond from the cashier are all associated with an increased likelihood of using borrowed funds. By contrast, having an active discount committee and requiring a bond from the president are both associated with a lower likelihood of using borrowed money. Thus, there is some indication that the different oversight measures triggered different responses on the part of managers in some cases.

6.3. Examining executive compensation schemes

Managers were paid salaries, and there is no evidence of stock-based, option-based, or cash bonuses in managerial compensation. Nevertheless, we are able to consider how managerial incentives may have been influenced by the extent to which the income of the manager covaried with the bank's income. The manager received a salary as well as dividend payouts by virtue of his ownership of shares. A number of recent studies find that compensation sensitivity to firm performance matters for risk taking and that when the executive's salary is more sensitive to risk – in our case, when it is more dependent on dividends – the bank's investments tend to be riskier (Bai and Elyasiani 2013; Cheng, Hong and Scheinkman 2013). For this analysis, we focus on the income of the president.

We find that having a higher proportion of the president's compensation in the form of salary (rather than dividends) is associated with having a higher proportion of loans related to real estate and having larger forecasted losses. These results point to greater risk taking when compensation is less due to profits. Of course, these results are subject to concerns about endogeneity; having larger expected losses presumably reduces profits and dividends, which increases the proportion of compensation due to salary.

6.4. Alternative measures of outside director influence

Our measure of outside director ownership considers all outside directors together. However, it is possible that the effects of board oversight depend on the amount of shares that particular board members own. To investigate that possibility, we create a dummy variable indicating when there is an outside director with more shares than any of the top three managers (individually, not collectively). Such an outside director exists for about 20 percent of the banks in our sample.

When a director with a large number of shares is on the Board, we find that the presence of such an individual tends to magnify the prior result of greater risk taking. For instance, the bank tends to have greater shares of loans related to real estate. The tendency for greater risk taking appears to be consequential as banks with large-shareholding directors also are more likely to close during the panic.

6.5. Additional control variables

We also tried including a variety of other variables as controls. One such variable was the average score for banks in the same city, which might reflect the best practice of the neighboring banks. This variable tended to have the same coefficient as the bank's own score variable. Including it did not affect the results about which we are most interested.

As an alternative to controlling for specific factors, we also replaced our controls with state fixed effects, which provide a more general control for things that might be less observable (such as differences in the ability of state banks to offer services prohibited to National banks). Using fixed effects also has little effect on the ownership structure or corporate governance regressions.

We also tried including the square of the ownership by the top three managers in case there were diminishing returns to ownership concentration. This variable also did not affect our main results and was largely insignificant.

7. Conclusion

Our results have interesting, important, and novel implications for how governance differences help banks to attract outside funding sources in an environment in which conflicts of interest are important. We find that managerial ownership and formal governance tools are alternative means to resolve conflicts. Each of these alternatives has important and somewhat different implications for rent seeking, the targeting of default risk, and the tools used (cash vs.

equity) to achieve the targeted level of default risk. More concentration of ownership leads to less formal structures of governance, more insider benefits through loans and salaries, more dividend paying, less risk taking (presumably due to risk aversion of manager stockholders), and more reliance on cash (to resolve asset-substitution and adverse-selection problems). Our findings on how managerial ownership affects risk taking are a useful complement to the recent literature on the impact of managerial incentives. Endogenously chosen formal governance structures produce greater risk, and more relative reliance on capital for risk management, but lower managerial salaries.

These latter findings are generally consistent with the literature on the value of corporate boards currently (John and Senbet, 1998, Hermalin and Weisbach, 2003). Some of our other results contrast with current experience. The expansion of the safety net and too-big-to-fail protection has been associated with a dramatic decline in banks' holdings of cash assets as a proportion of total assets. Furthermore, recent experience suggests that the discipline of outside stockholders (institutional blockholders) of bank stock has been associated with greater risk taking by protected banks, which has been interpreted as a means of maximizing the put option value of government protection (Laeven and Levine, 2009). The decline of cash and increased tolerance for risk by blockholders of banks that enjoy safety net protection contrast with the behavior of historical banks, which employed cash as part of a credible strategy to signal effective risk management, and which were subject to both depositor discipline and effective oversight by outside stockholders who used corporate governance tools as a means of limiting bank risk.

In summary, there are two key corporate governance problems that arise in banking: managerial rent extraction through simple transfers (high salaries and subsidized loans to managers) and the possibility of managers' undertaking excessive risk. High managerial ownership without formal corporate governance addresses the second of these problems, but permits greater managerial rent extraction than would occur under more formal corporate governance practices.

That outcome may be preferred by the managers who organize banks (i.e., if the potential rents from expanding the size of the bank are limited). If, however, managers wish to expand their enterprises to a scale that is large relative to their managerial stakes in the bank, then formal corporate governance is likely to become necessary. The formal approach to governance results in higher tolerance for risk (reflecting the greater diversification of holdings of bank stock) and a reduction in the rents that bank managers are able to extract though high salaries subsidized lending. In the presence of formal governance, managers share their privileged access to bank loans with outside directors.

Appendix

A.1. A Model of Endogenous Asymmetric Information and Corporate Governance

We begin with the simplest possible model of corporate governance choice, in which the assets of the bank consist entirely of loans and the financing of the bank consists only of stock. We relax these assumptions subsequently, and show that the central implications of the model – that is, that higher managerial wealth tends to reduce the reliance on formal corporate governance – also hold when we allow for deposit financing and the holding of cash assets.

A banker is endowed with wealth (E) and lending opportunities (a given number of profitable potential loans that he might undertake). Each loan is normalized to be of identical, unitary size. The number and amount of loans made, X , is between 0 and X^{max}. For simplicity, we assume that the bank holds only loans and is financed entirely by equity provided by the banker and outside investors (there is no bank debt). The manager's equity share of the bank, m, is therefore E/X. When we add deposit liabilities and cash assets to the model – as in Calomiris, Heider, and Hoerova (2014) – the main conclusions of the model are the same, but additional conclusions follow with respect to the role of cash in incentivizing good risk management. Interestingly, in this framework, cash plays an important role in incentivizing good risk management whether or not outsider financing is in the form of debt or equity. This warrants emphasis: unlike the discussion of Jensen and Meckling (1976), the problem of risk shifting in this model is a conflict between the insider/manager and all outside funding sources, not just debt holders.[29] In the simplified model, bank managers face incentives to increase risk in value-

[29] In the model presented in this appendix, the outside equity investor either becomes an insider by being invited to participate in governance, or remains uninvolved in governance knowing that the banker will invest in risk management due to a sufficiently high level of m (the banker's proportion of ownership). Calomiris, Heider, and Hoerova (2014) show that, in their model, the optimal contract for investors who remain outsiders (and therefore are not able to control risk management) would be senior deposits in a bank

destroying ways (so-called "asset substitution" or "risk shifting") even though debt finance is absent. Minority shareholders, like creditors, have an interest in ensuring proper risk management by bank managers, which can either be achieved through higher managerial stakes in the bank or formal corporate governance.

Outside equity is provided by a single outside investor. The outside investor and the banker are risk-neutral and have identical reservation returns of R, which represents the gross return they could earn on an alternative to lending. The loan opportunities of the banker are worth pursuing, but only if the banker invests his own effort in risk management. One can think of this investment in risk management as the banker's continuing performance of due diligence, monitoring, and enforcement of loan covenants. Risk management effort is privately costly to the banker; it entails disutility equal to BX. With risk management, loans earn a certain return of $Y > R$. Without risk management, loans earn Y with probability p and 0 with probability (1-p). Without risk management, loans are not worthwhile investments because $pY < R$.

The observability of risk management depends on the corporate governance environment chosen. If the banker chooses to include the outside investor in the governance of the bank, then risk management is observable and contractible. If the banker chooses not to include the outside investor in the governance of the bank, then risk management is a matter of private information only observed by the banker.

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with cash reserves as well as loans. The key differences in assumptions between that model and the simplified one presented here are the availability of a single large outside investor (assumed here) and the possibility of establishing oversight of risk management by that outside investor. Calomiris, Heider, and Hoerova (2014) assume that outside investors are fragmented. Their solution to incentive-compatible risk management entails the use of deposits and cash reserve holdings. In a small bank, with a single large outside investor, and the possibility of direct monitoring of the banker by that outside investor, depositor withdrawal threats and idle cash holdings are not necessary to achieve efficient risk management.

The banker's "salary" (S) is a form of rent extraction, which is endogenous to the corporate governance choice of the banker. If the banker does not include the outside investor in the governance of the bank, then he will set his salary such that the outside investor receives only the reservation return R. If the banker includes the outside investor in the governance of the firm, then he must share the rents from lending above R with the outside investor. The precise degree of that sharing should reflect, in a more realistic model of the market for outside funding, the competition among outside investors to supply funds to the bank. In our model, we simply assume, without loss of generality, that the banker and outside investor split the rents evenly when the outside investor is included in corporate governance.

As we will show, in equilibrium, because risk management is privately costly to the banker, without outside investor involvement in corporate governance, the banker will have to limit the size of the bank to X*. With outsider involvement in corporate governance, the banker can set the size of the bank to X^{max}. Thus, the banker trades off the benefit of greater rents that come with larger bank size (which is only feasible if he includes the outside investor in the governance of the bank, and shares the rents from lending with the outside investor) against the cost of sharing the rents of lending with the outside investor.

X* is determined by the incentive-compatibility constraint for the banker to invest in risk management in the absence of the involvement of the outside investor in governance. Without outsider involvement, the banker will choose to invest in risk management only if the payoff to him from doing so exceeds the payoff from not doing so. This is captured by the expression:

$$SX + m(YX - SX) - BX > p[SX + m(YX - SX)]. \quad (1)$$

Recall that m=E/X. X* is the maximum feasible level of X at which this equation is satisfied (that is, where the equation is satisfied as an equality, in which the banker is indifferent to investing in risk management). X* also implies a unique minimum value of m*.

$$m^* = E/X^* = \{[B/(1-p)] - S\}/ (Y - S). \quad (2)$$

As this expression shows, the critical values of m* and X* depend on S. S will be chosen to transfer all rent to the banker, leaving the outside investor earning only the reservation level of return, R. In other words, S is chosen by the banker to satisfy the following expression, which is the participation constraint for the outside investor:

$$(X - E)R = (1 - m)(YX - SX). \quad (3)$$

This expression reduces to $S = Y - R$.

Thus, the condition determining the critical value of m* can be rewritten as:

$$m^* = \{[B/(1-p)] - (Y - R)\}/ R. \quad (4)$$

This expression can be used to perform comparative static analysis of m* with respect to different values of p, Y, and R. In particular, it can be shown that a higher Y implies a lower value of m*. Intuitively, when rents are higher, the banker is able to credibly pledge to invest in risk management, without oversight, with a lower minimum managerial stake m*.

Whether the banker will choose not to include the outside investor in governance (and operate the bank at the level of X*) or to include the outside investor in governance (and operate the bank at X^{max}) depends on how much the banker receives under each of those alternatives. Recall that, if the outside investor is included in corporate governance, he will split the rents with the banker, and therefore, both the banker and the outside investor/director will each earn an identical "salary" of $S = (Y - R)/2$.

If the following condition is satisfied, the banker will earn more by choosing to include the outside investor in governance and operate the bank at X^{max}:

$$ER + X^{max}(Y - R)/2 > ER + X^*(Y - R). \quad (5)$$

So long as $X^{max} > 2X^*$, this condition is satisfied. Note that, in any comparative static calculation, Y affects the governance decision only indirectly through the positive effect of Y on X* (i.e., $dX^*/dY > 0$, implying that, ceteris paribus, higher Y makes it less likely that outside investor's will be invited to participate in governance).

The above model has clear implications for corporate governance decisions and their consequences. Depending on the size of rents per loan, and the number of loans available to the banker, he will decide whether to run the bank with no outside oversight or to include the outside investor in oversight. If the outside investor is included in oversight, then "asymmetric information" and "asset substitution risk" will be eliminated, and the banker's salary will be lower, as he is forced to share rent with the outside investor.

A.2. Adding cash assets and deposits to the model

The model can be extended to allow bankers to choose to hold cash in a credible and observable form. If cash assets are added to the model without also allowing for senior deposit claims, cash holdings would serve no purpose. To see why, consider the effect on equation (1) of bank cash holdings, C. Because cash is riskless, the banker will receive, in addition to the payoffs described in equation (1), an amount mC irrespective of whether the banker undertakes risk management. Thus, cash has no effect on the banker's risk management effort.

As Calomiris, Heider, and Hoerova (2014) point out, however, outsider financing via equity is not generally the optimal contract under these circumstances. By giving outsiders a senior claim on the cash flows of the bank, the banker ensures that when risk is not managed properly, and when low payoffs occur, outsiders will receive all of the cash, not just (1-m)C. Thus when outsider financing is partly in the form of deposits, and bankers are able to hold cash, bankers are able to commit to proper risk management by holding a sufficient amount of cash assets. Deposits and cash affect risk management because, unlike outside equity financing, deposit financing does not dilute the upside of the banker's profit, and unlike outside equity holders, deposits receive all of the bank's cash assets when the banker chooses not to invest in risk management and the bad outcome occurs (with probability 1-p).

A more realistic model (which would have to be much more complicated that either the framework presented here, or that of Calomiris, Heider, and Hoerova, 2014) could allow for both deposits and outside equity sources of funding. As Calomiris, Heider, and Hoerova conjecture, such a model could solve for an interior solution for the optimal mix of outside funding. In such a model, the marginal cost of relying more on outside equity is the marginal cost of corporate governance improvements to make risk management decisions observable to the marginal outside equity holders, while the cost of relying more on senior deposits is the opportunity cost of cash holdings. Bankers that choose more in formal corporate governance will tend to rely more on outside equity for their outside financing, and will hold a smaller fraction of their assets in cash. In our empirical results, we test, and confirm, those predictions.

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Table 1

Summary of analysis

Hypothesis 1

Exogenous influences that increase managerial ownership => Reduce reliance on formal governance

Explanation: When managerial stakes are higher, there is less need for formal governance to constrain managerial behavior toward risk.

Data analysis: Management ownership is instrumented (here and throughout) by exogenous turnover events. Formal governance is measured by the frequency of board meetings, the number of outside director appointments, the existence of an active discount committee, and the bonding of bank officers.

Hypothesis 2

More (exogenous) managerial ownership => Higher managers' salaries, more loans to managers, higher dividends

Explanation: When managers have more ownership, there is less formal governance and therefore managers enjoy greater control. They pay themselves more and give themselves greater access to loans. When they are large stockholders, managers also have strong incentives to pay dividends.

Data analysis: Managers' salaries, the fraction of loans that were lent to managers, and the ratio of dividends to paid in capital are analyzed as dependent variables.

Hypothesis 3

More (exogenous) managerial ownership => Less risk taking by the bank

Explanation: When managerial stakes are higher, managers will be more risk-averse because they are undiversified junior claimants on the bank.

Data analysis: Risk taking is measured by the use of high-cost "borrowed money" to finance the bank, as well as by the fraction of real estate loans to total loans, the examiner's estimates of losses relative to assets, and by the risk of bank closure.

Hypothesis 4

More (exogenous) managerial ownership => More use of cash rather than equity to reduce default risk

Explanation: Cash is useful to ensure managerial effort in risk management. More cash reduces managerial incentives to shirk in risk management and thereby protects depositors and outside shareholders from risk shifting in bad states. This protection, however, is less necessary when risk management is subject to oversight due to the presence of formal governance.

Data analysis: Banks choices of cash-to-assets ratio and equity-to-assets ratio are analyzed as dependent variables.

Table 2
List of variables

Variable	Source	Description
Management ownership	Exam report	The share of stock owned by the top 3 bank managers – the president, vice president, and cashier
Board meets month	Exam report	Indicator variable for the board of directors meeting monthly or more frequently
Outside directors on board	Exam report	The share of the board of directors that consisted of individuals that were not managers
Active discount committee	Exam report	Indicator variable for having an active independent discount committee
President bonded	Exam report	President posted a surety bond
Cashier bonded	Exam Report	Cashier posted a surety bond
Score	Derived	Sum of governance indicators
Turnover	Exam reports & bankers magazine	Number of changes in the president between 1882 call report and 1892 call report
Log assets	Call Report	Log of assets.
Log age	Comptroller & Rand McNally	Log of the difference between 1892 and the time the bank was established.
Salaries to assets	Exam report	Ratio of salaries of 3 officers to assets
Officers loans to insider loans	Exam report	Ratio of loans made to top 3 officers to loans to all insiders (managers and board members)
Dividends to shares	Exam report	Ratio of dividends paid at last payout to shares outstanding (dollars per share)
Used borrowed funds	Exam report & call report	Indicator that the bank borrowed using interbank certificates of deposit, rediscounts, or bills payable
Real estate loans to total loans	Exam report	Ratio of loans secured by real estate to total loans
Other real estate owned to assets	Call report	Ratio of other real estate owned to assets
Troubled loans to total loans	Exam report	Ratio of "troubled" loans – those past due or suspended – to total loans
Losses to assets	Exam report	Ratio of total losses on all balance sheet items as estimated by the examiner relative to assets
Loan losses to assets	Exam report	Ratio of losses on bad loans, other overdue paper, other loans and overdrafts to assets
Other losses to assets	Exam report	Ratio of losses on securities, bank house, furniture and fixtures, other real estate, cash, and other to assets
Losses on furnishings to assets	Exam report	Ratio of required write-downs on furniture and fixtures to assets
Individual deposits to total liabilities	Call report	Share of liabilities consisting of deposits by individuals

Checking deposits to individual deposits	Exam report	Share of individual deposits consisting of checking deposits
Net worth to assets	Exam report	Ratio of capital, surplus, and undivided profits to assets
Cash to assets	Exam report	Cash and legal tender to assets
Closed	Comptroller reports	Indicator that the bank suspended, failed, voluntarily liquidated after filing the Sept. 1892 call report but before Jan 1, 1894.
Reserve city	Comptroller reports	Indicator that the city is a reserve city
Log city population	1890 Census	Log of city population (city population is not available for El Paso, TX so county population is used)
Log distance to New York		Log distance in miles to NY
Fraction county income from agriculture	1890 Census	Value of agricultural products in the county divided by the sum of the value of agricultural products and the value of manufacturing
Mining in state	Statistical Abstract of the US for 1892	The state mined more than $1 million in gold and/or silver in 1891.
Old State		Statehood occurred prior to 1851

Table 3
Summary statistics

Variable	Mean	Median	Std. Dev	Min	25th percentile	75th percentile	Max
Management ownership	0.24	0.17	0.23	0.01	0.08	0.37	0.97
Board meets month	0.63	1	0.48	0	0	1	1
Outside directors on board	0.69	0.71	0.13	0.20	0.60	0.78	0.94
Active discount committee	0.60	1	0.49	0	0	1	1
President bonded	0.33	0	0.47	0	0	1	1
Cashier bonded	0.57	1	0.50	0	0	1	1
Score	2.69	3	1.56	0	1	4	5
Turnover	0.67	0	0.81	0	0	1	3
Log assets	14.1	14.1	0.8	12.0	13.5	14.7	15.9
Log age	2.42	2.40	0.74	0.69	1.79	3.14	3.43
Salaries to assets (percent)	0.59	0.46	0.45	0.02	0.33	0.69	3.61
Officers loans to insider loans (percent)	36.7	34.4	29.4	0	8.1	56.2	100
Dividends to shares	4.7	4	6.2	0	3	5	50
Used borrowed funds	0.31	0	0.46	0	0	1	1
Real estate loans to total loans (percent)	3.6	1.1	6.1	0	0	1.2	11.2
Other real estate owned to assets (percent)	0.9	.1	1.6	0	0	1.2	11.2
Troubled loans to total loans (percent)	9.1	5.9	9.9	0	2.5	12.4	71.8
Losses to assets (percent)	1.2	.2	3.8	0	0	1.1	32.1
Loan losses to assets (percent)	.95	.10	3.05	0	0	.85	28.6
Other losses to assets (percent)	0.27	0	0.96	0	0	0.15	11.3

Individual deposits to total liabilities	0.70	0.72	0.17	0.20	0.57	0.85	0.97
Checking deposits to individual deposits	0.74	0.77	0.20	0.18	0.61	0.91	1
Net worth to assets (percent)	32.9	30.7	12.7	8.5	24.1	39.9	76.1
Cash to assets (percent)	7.9	7.6	3.6	0.3	5.0	9.8	20.3
Closed	0.29	0	0.45	0	0	1	1
Reserve city	0.37	0	0.48	0	0	1	1
Log city population	11.0	10.8	0.45	8.2	10.3	11.9	12.6
Log distance to New York	7.07	7.05	0.45	6.35	6.76	7.40	7.81
Fraction county income from agriculture	0.25	0.12	0.27	0.02	0.07	0.36	0.96
Mining in state	0.21	0	0.41	0	0	1	1
Old state	0.55	1	0.50	0	0	1	1

Note. Sample includes all National banks in 37 cities as described in Section 4.1.

Table 4
Correlation of measures of ownership and of control

	Board meets at least monthly	High % Outsiders on Board	Active discount committee	President bonded	Cashier bonded
Management ownership	-0.23	-0.44	-0.25	-0.15	-0.22
Board meets at least monthly		0.20	0.33	0.08	0.15
High % Outsiders on Board			0.25	0.22	0.20
Active discount committee				0.24	0.43
President bonded					0.50

Note. Sample includes all National banks in 37 cities as described in Section 4.1.

Table 5
Determinants of the corporate governance score

	Score
Management ownership	-1.88***
	(0.44)
Log age	-0.35***
	(0.13)
Reserve city	.30
	(0.33)
Log city population	0.001
	(0.18)
Log distance to NYC	-1.04***
	(0.33)
Fraction county income from agriculture	-0.06
	(0.51)
Mining in state	.35
	(.31)
Old state	.63**
	(.24)
Intercept	11.65***
	(3.03)
Observations	206
Adj R^2	0.30
F-statistic	12.2

Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Estimated using ordinary least squares. Standard errors in parentheses and italics. Sample includes all National banks in 37 cities as described in Section 4.1.

Table 6
First stage for IV regressions

	Management ownership	Score
Turnover	-0.06***	0.38***
	(0.02)	*(0.12)*
Log age	0.05***	-0.49***
	(0.02)	*(0.14)*
Reserve city	-0.01	.20
	(0.05)	*(0.34)*
Log city population	-0.06*	0.18
	(0.03)	*(0.19)*
Log distance to NYC	0.09*	-1.15***
	(0.05)	*(0.33)*
Fraction county income from agriculture	-0.11	0.21
	(0.08)	*(0.52)*
Mining in state	.05	.17
	(.05)	*(.32)*
Old state	*-.04*	*.71***
	.04	*(.25)*
Intercept	.19	9.20
	(0.57)	*(3.68)*
Observations	206	206
Adj R^2	0.18	.28
F-statistic	6.53	10.9

Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Estimated using ordinary least squares. Standard errors in parentheses and italics. Sample includes all National banks in 37 cities as described in Section 4.1.

Table 7
Factors associated with the use of borrowed money

	Probit	Probit	IV	IV
Management ownership	-0.51***		-3.76***	
	(0.15)		*1.24*	
Score		0.02		.51***
		(0.2)		*(.17)*
Log age	-0.06	-0.08*	-.08	-0.003
	(0.04)	*(0.04)*	*(0.17)*	*(0.17)*
Reserve city	0.23**	0.23**	0.60	0.43
	(0.12)	*(0.12)*	*(0.40)*	*(0.39)*
Log city population	-0.21***	-0.19***	-0.72***	-0.50**
	(0.07)	*(0.07)*	*(0.22)*	*(0.21)*
Log distance to NY	0.17*	0.15	.74**	0.95***
	(0.10)	*(0.11)*	*(0.33)*	*(0.34)*
Fraction county income from agriculture	-0.65***	-0.58***	-2.10***	-1.48**
	(0.20)	*(0.20)*	*(0.67)*	*(0.65)*
Mining in state	0.02	0.01	-0.11	-0.13
	(0.10)	*(0.10)*	*(0.31)*	*(0.30)*
Old state	0.03	0.04	-.01	-.22
	(0.08)	*(0.08)*	*(0.25)*	*(0.27)*
Intercept	4.24	3.04	3.54	-2.67
	(3.83)	*(3.78)*	*(3.69)*	*(4.14)*
Observations	200	200	200	200
Pseudo R^2	0.13	0.09		
LR χ^2 (probit)/ Wald χ^2 (IV)	30.95	21.13	39.0	42.8

Notes: We report marginal effects evaluated at the mean. The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Specifications 1 and 2 estimated using probit analysis; specifications 3 and 4 estimated using an ordinary least squares first stage and a probit second stage. Standard errors in parentheses and italics. Standard errors in specifications 3 and 4 have been adjusted to reflect the use of generated regressors. Sample includes all National banks in 37 cities as described in Section 4.1 except where the examiner did not discuss use of certificates of deposit for the purpose of borrowing money.

Table 8
Association of other measures of bank risk with management ownership and bank governance

	Real estate loans to total loans		Estimated losses to assets		Bank closed its doors	
	Tobit	IV	Tobit	IV	Probit	IV
Management ownership	-.055**	-.19*	-3.3**	-6.1	-0.27*	-2.9**
	(.026)	*(.11)*	*(1.6)*	*(6.4)*	*(.15)*	*(1.34)*
Score	.001	.031	-.49**	1.02	.03	.45**
	(0.004)	*(0.020)*	*(.24)*	*(1.2)*	*(.02)*	*(.20)*

Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Tobit regressions in columns 1 and 3 are truncated below at zero. For columns 5 and 6, we report marginal effects. IV regressions are estimated using a two-step procedure. Standard errors in parentheses and italics. Standard errors in columns 2, 4, and 6 have been adjusted to reflect the use of generated regressors. All regressions include the controls used in the previous regressions (such as those shown in the preceding table). Sample includes all National banks in 37 cities as described in Section 4.1.

Table 9
Determinants of the ratio of net worth to assets

	OLS	OLS	IV	IV
Management ownership	-15.6***		-29.9**	
	(3.45)		(13.9)	
Score		1.08**		5.19*
		(0.55)		(2.72)
Individual deposits to total liabilities	-16.9***	-17.5***	-16.4***	-17.4***
	(4.9)	*(5.1)*	*(5.01)*	*(5.6)*
Checking deposits to individual deposits	14.9***	12.2**	17.2***	11.4**
	(4.8)	*(5.0)*	*(5.31)*	*(5.5)*
Log age	-6.1***	-6.38***	-5.36***	-4.6***
	(1.09)	*(1.15)*	*(1.29)*	*(1.7)*
Reserve city	-7.07***	-7.2***	-7.31***	-8.8***
	(2.63)	*(2.74)*	*(2.68)*	*(3.2)*
Log city population	-1.57	-.69	-2.43	-.89
	(1.61)	*(1.67)*	*(1.83)*	*(1.84)*
Log distance to NY	.55	0.42	1.31	5.53
	(2.55)	*(2.72)*	*(2.88)*	*(4.45)*
Fraction county income from agriculture	2.02	3.92	.18	3.57
	(4.09)	*(4.23)*	*(4.50)*	*(4.45)*
Mining in state	-3.75	-4.38*	-3.45	-5.59**
	(2.43)	*(2.53)*	*(2.48)*	*(2.90)*
Old state	-4.40**	-4.01*	-5.42**	-6.74**
	(2.13)	*(2.23)*	*(2.37)*	*(3.03)*
Intercept	70.8**	58.0*	71.4	11.8
	(28.5)	*(30.3)*	*(28.9)*	*(44.7)*
Observations	206	206	206	206
Adj R^2	0.37	0.31		
F-stat (OLS)/Wald χ^2 (IV)	12.9	10.4	110.0	86.2

Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Specifications 1 and 2 estimated using ordinary least squares; specifications 3 and 4 estimated using two-stage least squares. Standard errors in parentheses and italics. Standard errors in specifications 3 and 4 have been adjusted to reflect the use of generated regressors. Sample includes all National banks in 37 cities as described in Section 4.1

Table 10
Determinants of the ratio of cash to assets

	OLS	OLS	IV	IV
Management ownership	2.36**		8.12*	
	(1.07)		(4.42)	
Score		-0.26		-1.40*
		(0.17)		(.80)
Individual deposits to total liabilities	4.54***	4.62***	4.31***	4.59***
	(1.52)	*(1.53)*	*(1.60)*	*(1.67)*
Checking deposits to individual deposits	0.45	.88	-.47	1.11
	(1.49)	*(1.49)*	*(1.69)*	*(1.62)*
Log age	1.14***	1.15***	0.86**	.66
	(0.34)	*(0.34)*	*(0.41)*	*(0.50)*
Reserve city	0.25	0.31	0.34	0.74
	(0.82)	*(0.82)*	*(0.85)*	*(0.94)*
Log city population	1.45***	1.32***	1.79***	1.37***
	(0.50)	*(0.50)*	*(0.58)*	*(0.54)*
Log distance to NY	1.64**	1.54*	1.09	.11
	(0.79)	*(0.81)*	*(.92)*	*(1.32)*
Fraction county income from agriculture	-0.96	-1.24	-.22	-1.14
	(1.27)	*(1.27)*	*(1.43)*	*(1.38)*
Mining in state	.35	.48	0.24	.82
	(0.75)	*(0.76)*	*(0.79)*	*(0.86)*
Old state	.37	.37	.78	1.14
	(.66)	*(.67)*	*(.75)*	*(.90)*
Intercept	-26.4***	-23.5***	-26.7	-10.5
	(8.6)	*(9.08)*	*(9.2)*	*(13.2)*
Observations	206	206	206	206
Adj R^2	0.25	0.24		
F-stat (OLS)/Wald χ^2 (IV)	8.75	8.36	71.5	65.04

Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Specifications 1 and 2 estimated using ordinary least squares; specifications 3 and 4 estimated using two-stage least squares. Standard errors in parentheses and italics. Standard errors in specifications 3 and 4 have been adjusted to reflect the use of generated regressors. Sample includes all National banks in 37 cities as described in Section 4.1

Table 11
Determinants of manager salaries relative to assets

	OLS	OLS
Management ownership	0.34**	
	(0.18)	
Score		-0.01
		(0.03)
Log age	-0.20***	-0.18***
	(0.05)	*(0.05)*
Reserve city	0.06	0.05
	(0.12)	*(0.13)*
Log city population	-0.05	-0.06
	(0.08)	*(0.08)*
Log distance to NY	0.14	0.16
	(0.12)	*(0.13)*
Fraction county income from agriculture	0.11	0.09
	(0.19)	*(0.20)*
Mining in state	.004	-0.003
	(0.12)	*(0.13)*
Old state	0.13	0.12
	(0.09)	*(0.19)*
Intercept	.40	.53
	(1.40)	*(1.46)*
Observations	172	172
Adj R^2	0.12	0.10
F-stat	4.19	3.46

Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Specifications 1 and 2 estimated using ordinary least squares; specifications 3 and 4 estimated using two-stage least squares. Standard errors in parentheses and italics. Standard errors in specifications 3 and 4 have been adjusted to reflect the use of generated regressors. Sample includes all National banks in 37 cities as described in Section 4.1 where the manager salaries were reported.

Table 12
Determinants of loans to management as a share of insider loans

	OLS	OLS	IV	IV
Management ownership	33.38***		62.6*	
	(8.89)		*(36.8)*	
Score		-5.08***		-10.5*
		(1.38)		*(6.23)*
Log age	.53	-.16	-.80	-2.49
	(2.69)	*(2.73)*	*(3.15)*	*(3.82)*
Reserve city	2.45	3.18	3.41	5.12
	(6.67)	*(6.69)*	*(6.80)*	*(7.13)*
Log city population	-.62	-1.55	.53	-1.15
	(3.81)	*(3.81)*	*(4.09)*	*(3.89)*
Log distance to NY	8.39	5.59	5.34	-1.08
	(6.58)	*(6.73)*	*(7.58)*	*(10.1)*
Fraction county income from agriculture	21.1**	18.56*	23.9**	19.2*
	(10.3)	*(10.28)*	*(10.9)*	*(10.5)*
Mining in state	1.07	3.47	.31	5.08
	(6.29)	*(6.30)*	*(6.38)*	*(6.65)*
Old state	-2.10	.09	-.89	3.89
	(4.91)	*(4.99)*	*(5.14)*	*(6.63)*
Intercept	-31.4	20.6	-28.0	80.1
	(72.1)	*(73.8)*	*(72.5)*	*(100.5)*
Observations	206	206	206	206
Adj R^2	0.18	0.14		
F-stat (OLS)/Wald χ^2 (IV)	5.32	5.25	31.1	30.4

Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Specifications 1 and 2 estimated using ordinary least squares; specifications 3 and 4 estimated using two-stage least squares. Standard errors in parentheses and italics. Standard errors in specifications 3 and 4 have been adjusted to reflect the use of generated regressors. Sample includes all National banks in 37 cities as described in Section 4.1.

Table 13
Determinants of the ratio of dividends to shares

	OLS	OLS
Management ownership	6.59***	
	(1.97)	
Score		-0.55*
		(0.31)
Log age	1.85***	1.98***
	(0.60)	*(0.62)*
Reserve city	-0.21	-0.24
	(1.45)	*(1.48)*
Log city population	0.43	.21
	(0.83)	*(0.84)*
Log distance to NY	3.84***	3.87***
	(1.43)	*(1.50)*
Fraction county income from agriculture	5.21**	4.72**
	(2.23)	*(2.27)*
Mining in state	-1.73	-1.40
	(1.36)	*(1.39)*
Old state	.75	.93
	(1.08)	*(1.11)*
Intercept	-34.5	-29.6
	(15.6)	*(16.3)*
Observations	201	201
Adj R^2	0.15	0.11
F-stat	5.29	4.14

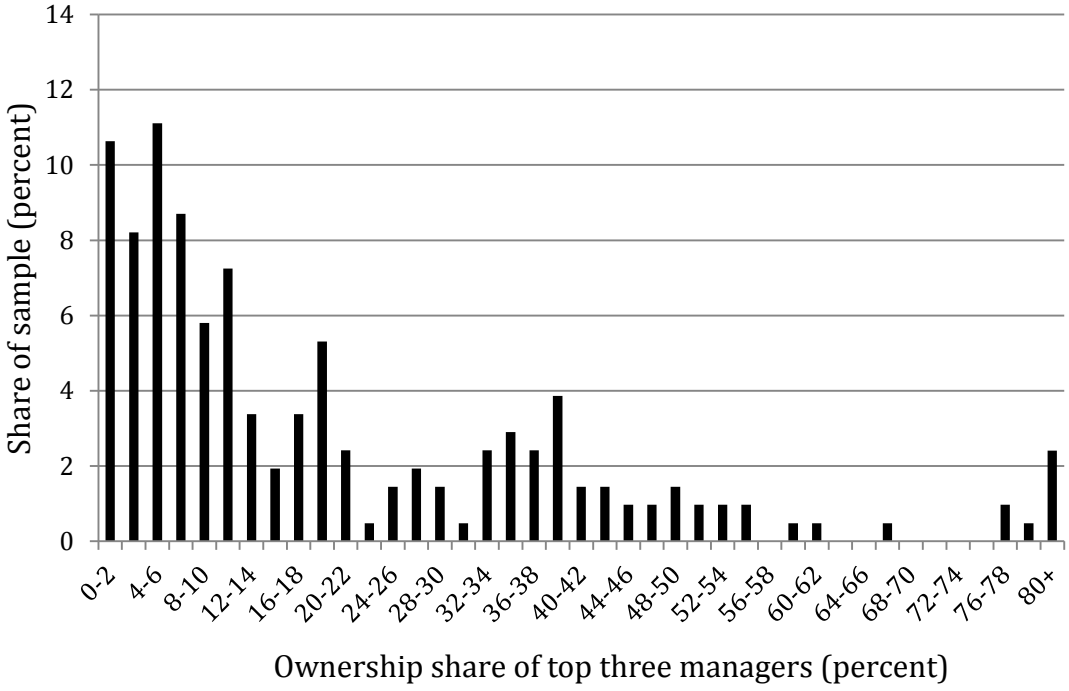
Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Specifications 1 and 2 estimated using ordinary least squares; specifications 3 and 4 estimated using two-stage least squares. Standard errors in parentheses and italics. Standard errors in specifications 3 and 4 have been adjusted to reflect the use of generated regressors. Sample includes all National banks in 37 cities as described in Section 4.1 except those too new to be eligible to pay dividends.

Table 14
Mean bank characteristics by management ownership and governance score

	High ownership high governance	High ownership low governance	Low ownership high governance	Low ownership low governance	Test for differences in means		
	[1]	[2]	[3]	[4]	1 vs 4	2 vs 4	3 vs 4
Salary to assets	0.67 *(0.55)*	0.75 *(0.49)*	0.51 *(0.45)*	0.54 *(0.20)*		*	
Officer loans to insider loans	36.3 *(26.2)*	53.3 *(32.2)*	24.7 *(22.8)*	33.9 *(28.3)*		***	*
Dividends per share	4.4 *(3.4)*	7.0 *(10.4)*	3.3 *(1.5)*	4.1 *(2.9)*			*
Used borrowed funds	20.9 *(41.2)*	27.1 *(44.8)*	33.8 *(47.6)*	45.8 *(50.9)*	**	*	
Real estate loans to all loans	3.2 *(4.4)*	3.5 *(4.3)*	2.5 *(4.8)*	7.3 *(11.7)*	**	**	***
Losses to assets	0.7 *(1.5)*	1.1 *(4.1)*	0.8 *(1.3)*	3.6 *(7.6)*	**	**	***
Loan losses to assets	0.58 *(1.28)*	0.90 *(3.72)*	0.58 *(1.00)*	2.73 *(5.66)*	**	*	***
Other losses to assets	0.10 *(0.28)*	0.21 *(0.60)*	0.21 *(0.52)*	0.86 *(2.24)*	**	**	**
Closed	30.2 *(46.5)*	28.3 *(45.4)*	25.0 *(43.6)*	33.3 *(48.0)*			
Cash to liabilities	7.9 *(4.3)*	8.3 *(3.8)*	7.6 *(3.3)*	8.1 *(3.1)*			
Net worth to assets	30.4 *(11.2)*	30.2 *(11.4)*	35.8 *(13.1)*	34.8 *(15.5)*			

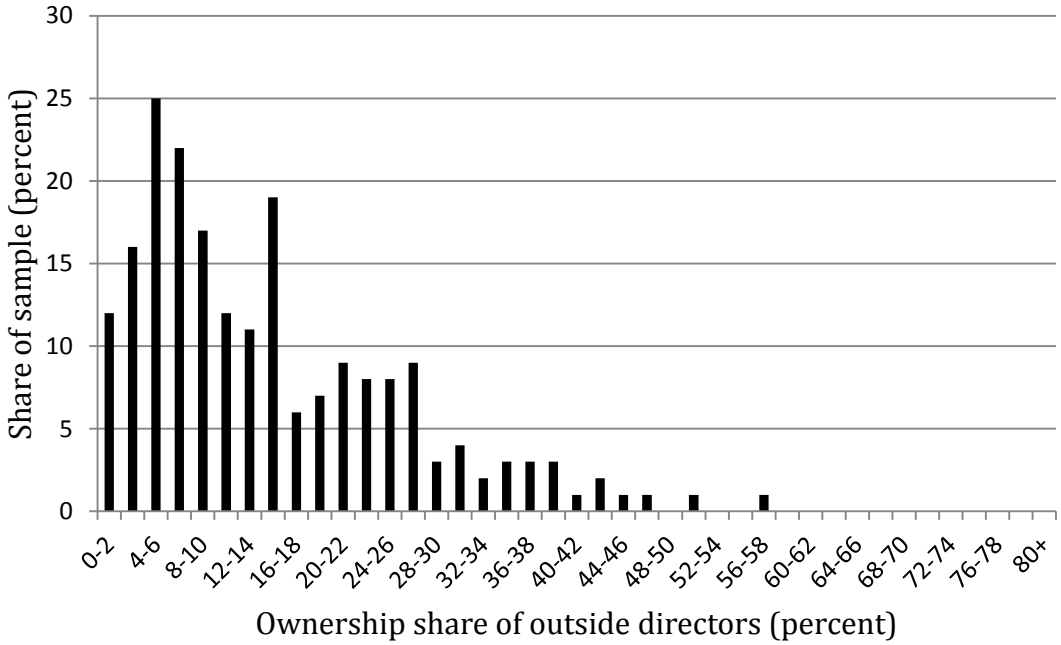
Notes: The symbols (***), (**), and (*) indicate statistical significance at the 1, 5, and 10 percent level, respectively. Standard errors in parentheses and italics. Sample includes all National banks in 37 cities as described in Section 4.1.

Figure 1
Distribution of ownership by top three managers



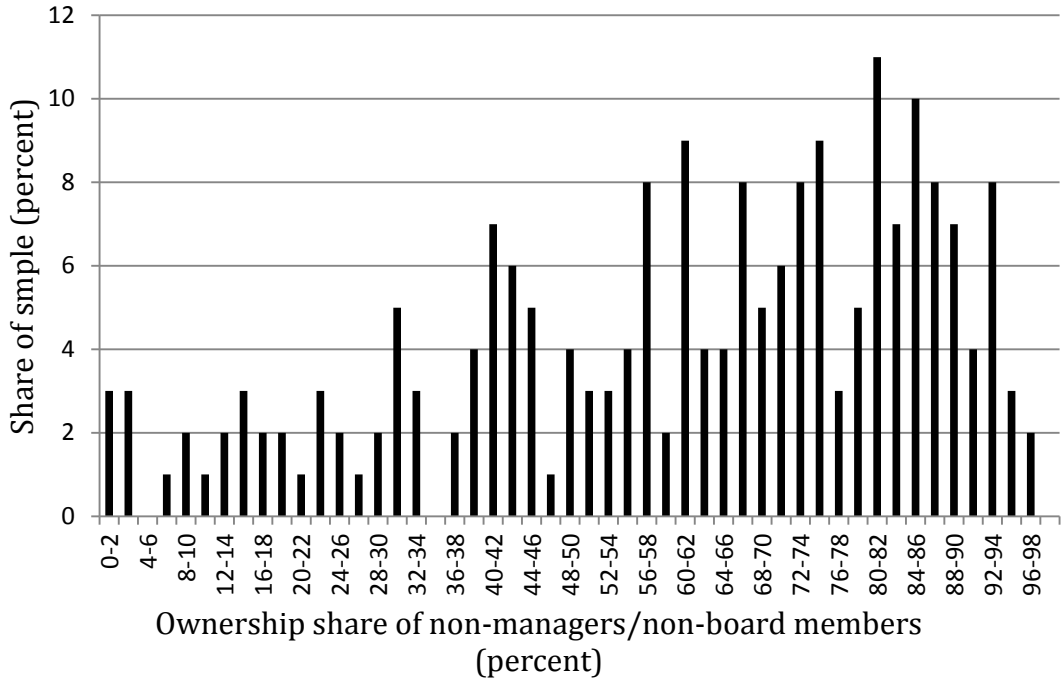
Note. Sample includes all National banks in 37 cities as described in Section 4.1.

Figure 2
Distribution of ownership by outside directors



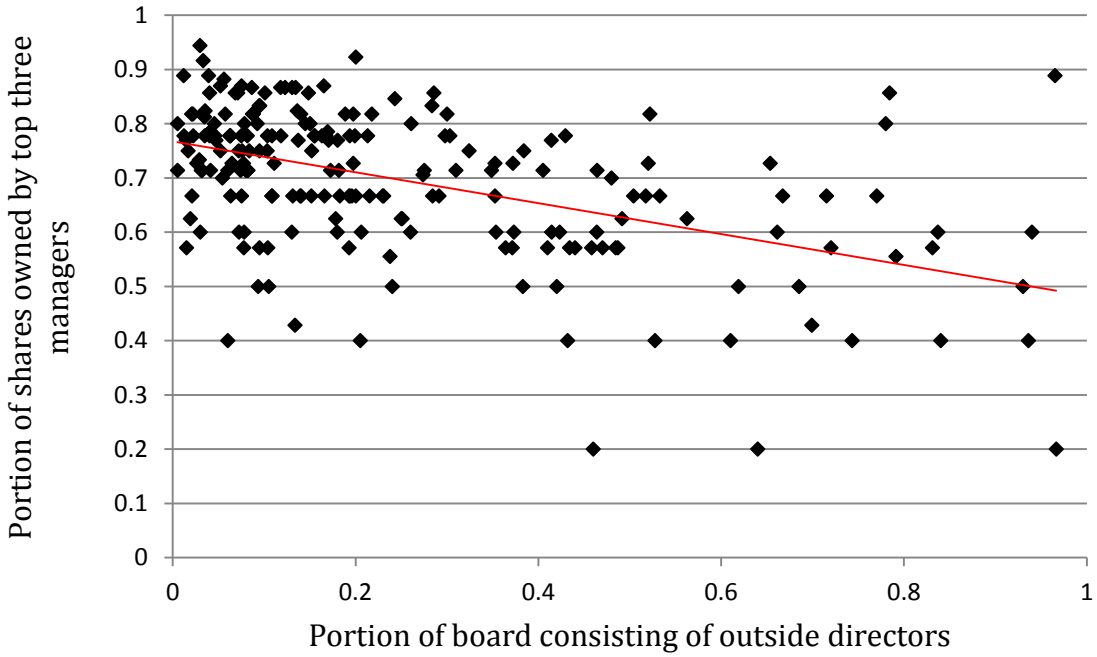
Note. Sample includes all National banks in 37 cities as described in Section 4.1.

Figure 3
Distribution of ownership by non-managers, non-board members



Note. Sample includes all National banks in 37 cities as described in Section 4.1.

Figure 4
Manager ownership and board composition



Note. Sample includes all National banks in 37 cities as described in Section 4.1.