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Corporate Performance, Board Structure, and Their Determinants in the Banking Industry

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Abstract

The subprime crisis highlights how little we know about bank governance. This paper addresses a long-standing gap in the literature by analyzing the relationship between board governance and performance using a sample of banking firm data that span thirty-four years. We find that board independence is not related to performance, as measured by a proxy for Tobin's Q. However, board size is positively related to performance. Our results are not driven by M&A activity. But we provide new evidence that increases in board size due to additions of directors with subsidiary directorships may add value as bank holding company complexity increases. We conclude that governance regulation should take unique features of bank governance into account.

Key words: corporate governance; board structure; banking industry; holding company; complexity

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1 Introduction

Most studies of board effectiveness exclude financial firms from their samples. As a result, we know very little about the effectiveness of banking firm governance.[4] But it has arguably never been as important to understand the governance of banking firms as it is now following the subprime mortgage crisis. This financial crisis differs from previous financial crises in that bank governance is being accorded a large part of the blame. For example, the OECD Steering Group on Corporate Governance argues that board failures in financial firms are a major cause of the financial crisis (Kirkpatrick, 2009) and has launched an action plan to improve their governance. Similarly, the U.K. government commissioned Sir David Walker to recommend measures to improve board-level governance at banks.

But, in order to evaluate and propose changes to banking firms' governance structures, it is important to understand how banks are typically governed and whether and how banking firm governance differs from the governance of unregulated firms. This last issue is particularly important since many governance reform proposals have a "one-size-fits-all" approach. For example, the Sarbanes-Oxley Act (SOX) of 2002 and the NYSE and Nasdaq exchange listing rules emphasize director independence. But it is not clear whether these independence standards should be applied to banks. Bank directors often represent some of the best customers of the bank. But, such directors should most likely not be considered independent. Therefore, to comply with SOX, banks have to exclude them from audit committees and either increase board size to satisfy independence requirements or discontinue the practice of appointing customer representatives to their boards. While such changes could be beneficial, there are arguments why having bank customers on the board may be a good practice.

SOX and the listing rules originated because of scandals at non-financial firms, which may explain why they do not take special features of bank governance into account. However, post-crisis governance reforms aimed primarily at the financial service industry also do not allow for the possibility that bank governance has unique features. Despite the dearth of evidence on the role of independent and customer-linked directors in banks, Section 952 of the Dodd-Frank Act of 2010 mandates fully independent compensation committees. In a more startling example, the Walker Review, which serves as the basis for the 2010 U.K. Governance Code, points out that the boards of listed U.K. banks in 2007/8 were larger than those of other listed companies (Walker, 2009, p. 41). This is problematic because

[4] Prior to the financial crisis, relatively few papers specifically analyzed the effectiveness of board structure in banking firms. Some exceptions are Brickley and James (1987), Brewer, Jackson and Jagtiani (2000), Byrd, Fraser, Lee and Williams (2001). Adams (2010) discusses additional literature.

of "a widely-held view that the overall effectiveness of the board, outside a quite narrow range, tends to vary inversely with its size. That view would probably tend to converge around an "ideal" size of 10-12 members,... This view appears to be confirmed by behavioral studies of group size as described briefly..., attached as Annex 4." Annex 4 describes that a problem with large boards is that they suffer, amongst other problems, from "groupthink" and argues that the optimal group size is less than 12 people. In support of the "groupthink" argument, the annex cites Janis (1972) which describes foreign-policy failures of governmental organizations. In support of the group size argument, the annex cites Dunbar (1993) which is a study extending findings concerning group size in non-human primates to modern humans. Clearly, the suggestion that bank boards are too big is not based on any features of banks.

The fact that bank boards are larger in the U.K. than those of other listed firms mirrors the findings for the U.S.. Moreover, this difference appears to be persistent since it has been documented for various time periods. Kroszner and Strahan (2001) find for the 1992 Forbes 500 that banks have larger boards and a lower fraction of insiders than non-financial firms, even adjusting for firm size. Booth, Cornett and Tehranian (2002) compare the 100 largest banks to the 100 largest industrial firms in 1999 and find that they have larger boards with a greater proportion of outsiders. Adams and Mehran (2003) find that bank boards are larger and more independent over the period 1986-1999 using a sample of 35 large bank holding companies and data on large manufacturing firms from Yermack (1996), amongst others. Adams (2011) finds that bank boards are larger and more independent than non-financial firms in the Riskmetrics database of S&P 1500 firms from 1996-2007.

Banks clearly appear to have different governance structures than non-financial firms. The question is whether these governance structures are ineffective, as the Walker Review seems to suggest, and whether implementing independence standards imposed by Dodd-Frank, SOX and the major stock exchanges will improve bank governance. The purpose of this paper is to try to provide an answer to this question by examining the relationship between board composition and size and bank performance. We focus on large, publicly traded bank holding companies (BHCs) in the U.S., which are the banks that are mentioned most often in the context of the crisis.

We first examine the relationship between board composition and size and performance in a sample of data on 35 BHCs from 1986-1999. We deliberately focused on a relatively small number of BHCs over a longer period of time to ensure that there would be sufficient variation in governance variables which typically do not change much over time. In addition, we collected detailed data on variables that have received attention in the law, economics,

and organization literature and which are recognized to be correlated with sound corporate governance, but that are generally not studied as a group due to high data collection costs. Since internal governance mechanisms are ultimately simultaneously chosen, the richness of this data enables us to limit omitted variable bias in performance regressions both by using firm fixed-effects and by controlling for possible interdependencies among governance mechanisms. To investigate alternative explanations for our findings, we extend this sample by collecting data on board size, board composition and performance from 1964-1985. Our data provides information on bank governance over a 34 year time period prior to the governance reform movement embodied in SOX and the revised listing requirements at the major exchanges. Thus, it helps us document persistent governance choices banks have made in the absence of strong external governance pressure. As such, it serves as a useful baseline against which to analyze any proposed governance changes.

Consistent with previous studies in governance (e.g. Caprio, Laeven and Levine, 2007), we examine the relationship between banking firm board structure and performance as proxied by a measure of Tobin's Q. As in many studies of non-financial firms, we find that the proportion of independent outsiders on the board is not significantly related to performance. However, in contrast to findings for non-financial firms in Yermack (1996), Eisenberg, Sundgren and Wells (1998) and Coles, Daniel and Naveen (2008), the natural logarithm of board size is, on average, positively related to Tobin's Q in our sample.

Since we use firm fixed-effects in our regressions, this finding is consistent with the idea that increases in board size add value because banks are growing in complexity over time. However, the time period of this sample was also a period of active consolidation in the banking industry as a consequence of the deregulation of interstate banking restrictions. Thus, a concern is that our results could be driven by endogeneity due to omitted variables related to M&A activity. We investigate this possibility but find little evidence that M&A activity is driving our results. For example, we find that board size is positively correlated with performance during the period 1965-1985, a period in which there was relatively little M&A activity because of regulatory restrictions on interstate banking.

Our results are robust to addressing endogeneity concerns that arise because of variables that are plausibly omitted from our performance regressions. However, an obvious concern is that our results could be driven by reverse causality. In order to address this endogeneity problem, we need an instrumental variable that is correlated with board size but uncorrelated with performance except through variables already included in our regression. Unfortunately, it is difficult to come up with valid instruments in the context of governance regressions. The

factors that are arguably most correlated with the endogenous variable are other governance or firm characteristics that are already (or should be) included in performance regressions. For example, Eisenberg, Sundgren and Wells (1998) use firm age and group membership as instruments for board size in performance regressions. But, they originally argued that both firm age and group membership should be control variables in their performance regressions, which means their instruments are invalid by construction. Coles, Daniel and Naveen (2008) address the endogeneity of board size in their performance regressions using three-stage least squares. But, they do not discuss the validity of their instruments for board size, which are firm age and CEO characteristics, such as tenure. Lehn, Patro and Zhao (2008) use 5-year lagged performance as an instrument for board size, but lagged performance is potentially correlated with performance. Finding an instrument is further complicated in the context of fixed-effect regressions, because we require a variable with sufficient variation over time. Thus, rather than identifying the causal relationship between board size and performance econometrically,[5] we try to increase confidence that our results are not spurious by examining whether there is a plausible mechanism that might drive it. In particular, we examine whether the value of large boards appears to be driven by BHC complexity.

We examine measures of operational, geographic and financial complexity, but do not find that large boards add more value as BHC complexity grows. We argue that one reason for this may be that some directors are more suited than others to help the BHC's management deal with complexity. In particular, BHC directors often have subsidiary directorships. It is plausible that these directors play a particular role in coordinating activities in the holding company and thus dealing with complexity. Consistent with this argument, we find that when complexity increases, firm performance improves when BHCs have more of their directors sitting on subsidiary boards.

There can be several reasons why large boards may add value in BHCs. But, one reason may be that larger boards contain a larger number of directors who also sit on subsidiary boards. Although we cannot claim to have identified the causal effect of board size on performance, we believe our results are at least suggestive that for banking firms the advantages of larger boards outweigh their costs.

[5] We provide an attempt at addressing the reverse causality problem using a measure of flight availability to airports as an instrument in the unpublished appendix of this paper. We reject that the model in column I of Table 3 is underidentified at the 1% level using the Kleibergen-Paap rk Wald statistic provided by ivreg2 in Stata, so our instrument appears relevant. However, the first stage robust Kleibergen-Paap Wald rk F-statistic is only 7.04. Staiger and Stock (1997) recommend F-statistics of 10 in the first stage. Thus, our instrument is not as strong as we would like. Nevertheless, we perform a test of endogeneity of board size and cannot reject that Ln(Board size) is exogneous (the p-value is 0.7706). If our instrument is not too weak to render the inference from this test meaningless, this suggests that OLS estimators are unbiased.

Our paper contributes to the literature in several ways. First, to our knowledge we analyze the most extensive time series of data on bank board governance in the literature. Our paper complements other papers examining governance over long periods of time, e.g. Koles and Lehn (1999) who analyze the governance of the U.S. airline industry over a 22 year period and Lehn, Patro and Zhao (2008) who examine determinants of the size and structure of boards of 82 manufacturing firms from 1935-2000. Second, our paper complements a stream of research documenting that shareholder governance mechanisms, such as ownership, are important for bank behavior. Barth, Caprio and Levine (2004) find that bank development, performance and stability are higher in countries with more private-sector control of banks. Laeven and Levine (2009) show that private ownership by banks is related to their risk-taking and Caprio, Laeven and Levine (2007) show, amongst others, that bank valuations are higher in countries with stronger shareholder protection laws after controlling for the effect of bank regulation. Similarly, we show that board-level governance mechanisms, such as size and composition, are related to bank valuations. Because the BHCs in our sample all have the same regulator, the Federal Reserve, our results also control for the effect of regulation at the BHC level.

Our paper also complements the literature on non-financial firms arguing that some firms may benefit from large boards (e.g. Boone, Fields, Karpoff and Raheja, 2007; Coles, Daniel and Naveen, 2008; Lehn, Patro and Zhao, 2008 and Linck, Netter and Yang, 2008). However, in our sample, increases in board size are not generally value-enhancing as firm complexity increases, in contrast to Coles, Daniel and Naveen (2008) and Graham, Hazarika and Narasimhan (2011). Instead, increases in board size due to additions of directors who also sit on subsidiary boards appear to be important. As far as we know, there is no literature documenting that subsidiary directorships are common in non-financial firms. We appear to be the first to document that such subsidiary directorships may be important for banks. Overall our findings highlight the need to exercise caution in reforming bank governance following the subprime mortgage crisis. Simply adopting proposals that are largely motivated by research on non-financial firms are unlikely to be effective.

Because our firms are banks, it is natural to ask whether our findings are driven by regulatory constraints on their boards. Thus, we first review regulations concerning governance in Section 2. Next, we discuss theoretical predictions concerning the relationship between board structure and performance. Section 3 describes the data. In Section 4, we investigate the relation between board structure and firm value. We analyze the role of M&A activity and complexity in Section 5. In this Section we also examine the role of subsidiary directorships. We conclude in Section 6.

2 BHC boards and performance

The theoretical governance literature argues that boards fulfill their duties of advising and monitoring management by choosing board composition and size appropriately (Adams and Ferreira, 2007; Harris and Raviv, 2008; Raheja, 2005). The empirical literature on non-financial firms finds evidence consistent with this view. Because boards of publicly traded BHCs have the same legal responsibilities as boards of non-financial firms, i.e. the duty of care and loyalty, BHC board composition and size should play a similarly important role in the execution of BHC boards' duties. However, because banks differ in several important aspects from non-financial firms, it is not necessarily clear that these variables should have the same impact on BHC firm performance. Most obviously, regulation could change the relationship between board structure and performance (e.g. Booth, Cornett, Tehranian, 2002). Banks also differ in their capital structure and organizational form from non-financial firms. We discuss some regulatory influences on BHC board structure below (see also Adams, 2010). We then make some predictions about the impact of BHC board composition and size on performance.

2.1 Institutional and regulatory influences on bank boards

Although BHC boards may have played a role in prior banking and finance crises, they never played a sufficiently large role for regulators to impose significant restrictions on them. Thus, perhaps surprisingly, there are few governance constraints on publicly-traded BHCs other than those imposed on all public corporations by SOX, exchange listing rules and the 2010 Dodd-Frank Act. If a BHC is troubled, it must submit written notice to the Federal Reserve Board thirty days before adding or replacing members of its board. A director of a BHC may also not be a director of another BHC in the same city, town or Regional Metropolitan Area (RMSA). A director of a BHC with more than $2.5 billion in total assets may not be the director of another BHC with over $1.5 billion total assets (Federal Reserve Regulation L). Finally, the 2010 Dodd-Frank Act specifies enhanced oversight of executive compensation in financial firms with a federal regulator.

The absence of rules specific to BHCs does not mean that regulation cannot influence BHC boards. Most directly, regulators may provide informal guidance to boards in the form of Supervision and Regulation (SR) letters and examination manuals. Adams and Mehran (2003) provide some examples of such regulatory guidance. However, none of their examples suggests that regulators directly intervene in board functioning or affect board structure decisions at the BHC level. For example, regulators expect boards to review budgets and

risk-management policies (Adams and Mehran, 2003, footnote 5), but they do not dictate how boards should carry out these duties. Moreover, these regulations and expectations may not always be enforced (see e.g. Adams and Ferreira, 2011).

More indirectly, regulatory restrictions on subsidiary bank boards may influence BHC boards. One key way in which BHCs differ from non-financial firms is that they are all holding companies. This means that each subsidiary bank or BHC is separately chartered with its own board. The implication of this structure for BHCs appears to be that activities of subsidiaries are influenced through their boards. As Adams (2010) documents, directors of the parent BHC will often sit on the board of subsidiaries and in some cases all BHC directors will sit on the board of the BHC's lead bank. This means that these directors are subject to board-level regulatory restrictions at the bank level. These restrictions will vary depending on whether the bank is a state or national bank.

All state banks are subject to state banking law in the state they are chartered. Amongst others, these laws may impose state residency or US citizenship requirements, require directors to own stock in the bank and/or impose restrictions on the operation or structure of the board. To give just two examples, New York State Banking Law requires that bank boards consist of between 5 and 15 members, half of which must be US citizens. In addition, bank boards must hold regular monthly meetings at least ten times a year. Alabama Banking Law requires that bank directors hold stock in the bank or parent holding company and that bank boards hold bimonthly meetings. State banks that choose to be members of the Federal Reserve System are also subject to Regulation L which limits simultaneous directorships in state member banks.

National banks are governed by the National Banking Act in Title 12 of the US Code. Title 12 specifies that national banks must have between 5 and 25 directors, who must be citizens of the US and a majority of whom must reside in the state, territory or district of the bank or within 100 miles of it for at least a year prior to and during their term. Directors must take an oath upon election or appointment, must hold stock in the bank or parent holding company and may not serve for more than 3 years. The OCC has jurisdiction over governance issues and may grant waivers to these laws.

To the extent that the board of the BHC and the board of subsidiary banks overlap, these bank-level board regulations may affect board structure at the BHC level. Although it is difficult to make any specific predictions about the impact of bank-level regulation, it is possible that state and national bank residency requirements and Regulation L restrictions on interlocks will limit the potential pool of directors BHCs have at their disposal. This

problem is likely to get worse the more subsidiaries the BHC has, as each subsidiary must have sufficient directors for its board. If so, these bank-level regulations may make it more difficult to detect beneficial effects of large and independent boards in BHCs.

Changes in regulation may also indirectly affect BHC boards. Prior to 1975, no state allowed interstate banking. But by 1994 restrictions on interstate banking were eliminated with the passage of the Riegle-Neal Interstate Banking and Efficiency Act. Jones and Critchfield (2005) argue that the Riegle-Neal Act (along with prior state level interstate banking laws) was a major cause of consolidation in the banking industry. They show, for example, that the number of banks dropped from 14,884 in 1984 to 7,842 in 2003. M&A activity affects board governance in several ways. First, it is common to add directors of target firms to the board of the acquirer in friendly acquisitions, as most banking M&As are. This may lead to potentially permanent increases in board size. Second, M&A activity may have disciplining effects even if it is friendly. Thus, the existence of an active market for corporate control may lead to general improvements in board effectiveness (see Shranz, 1993), even though some have suggested that bank managers may engage in mergers to protect their own interests, e.g. to obtain higher compensation (e.g. Bliss and Rosen, 2001) or too-big-to fail status (e.g. Penas and Unal, 2004).

In the 1990s, banks were also increasingly allowed to engage in investment banking activities (with all restrictions on such activities formally abolished by the passage of the Gramm-Leach-Bliley Act in 1999), which may have influenced bank boards by changing the nature of the competitive environment as well as the expertise required for directors. Overall, deregulation may have had an important impact both on BHC board structure, as well as the relationship between board structure and performance. We examine this issue in more detail in Section 5.

2.2 BHC board composition and performance

The literature on non-financial firms argues that firms choose board composition to balance monitoring and advising needs. Independent outsiders, i.e. directors who have no direct financial, family or interlock ties with management, are considered to be more effective monitors of management because they are in theory less beholden to management (e.g. Hermalin and Weisbach, 2003). In addition, they bring a different perspective to bear on problems management faces and thus serve a valuable advisory role. This role is likely to be particularly important in complex firms. A potential disadvantage of outside directors is that they may lack relevant firm-specific information (e.g. Adams and Ferreira, 2007), which is

likely to be especially problematic for small growth firms. Consistent with these arguments, Boone, Fields, Karpoff and Raheja (2007), Coles, Daniel and Naveen (2008), Lehn, Patro and Zhao (2008) and Linck, Netter and Yang (2008) provide evidence in samples of non-financial firms that the proportion of outsiders on the board is positively related to measures of firm complexity, such as size. Coles, Daniel and Naveen (2008) document that firm performance increases in the proportion of insiders in high R&D firms.

Ex ante there is no reason to believe that similar arguments should not hold for banks. Because the banks in our sample are all large, established banks, we expect them to have a large proportion of independent directors. It is less clear what the relationship between board independence and firm performance should be. On the one hand, firm performance should increase with independence as a measure of the monitoring intensity of the board. On the other hand, there may be costs associated with independence due to outside directors' lack of firm-specific knowledge. In the case of banks, these costs may be exacerbated because regulatory restrictions may act to limit the pool of directors from which BHCs can choose, as we argue above. Ultimately, the relationship between performance and independence must be determined empirically.

Establishing the empirical relationship between performance and board independence for banks is complicated by the fact that it is difficult to measure independence in banks. As the Federal Reserve Bank of Atlanta's *The Director's Primer* points out, bank directors often represent some of the best customers of the bank (Federal Reserve Bank of Atlanta, 2002, p. 47). Customer-directors are likely to have different incentives and motivations than other outside directors and may not be truly independent. Although publicly traded BHCs are supposed to disclose related party transactions, they often simply state that lending relationships with directors' employers are not made on preferential terms without disclosing which directors are associated with customers.[6] It is likely that customers themselves do not wish this information to be disclosed. Thus, measures of board independence in banking are potentially always overstated,[7] which could lead to biased inference in regression analysis. Furthermore, it is difficult to sign the bias. To at least partially address this problem, we estimate our performance regressions both with the fraction of independent outsiders, as defined conventionally, as well as with the fraction of non-insiders, i.e. all directors who

[6] A good example can be found in Citibank's 2009 proxy statement at http://www.citigroup.com/citi/fin/data/ar09cp.pdf.

[7] Such lending relationships may be large enough to matter for independence. For example, Riggs National Corporation's proxy for 1988 (p. 8) discloses that: "the aggregate principal amount of indebtedness to banking subsidiaries of the Corporation owed by directors and executive officers of Riggs Bank and Riggs Corporation and their associates represented approximately 78.9% of total stockholder's equity and 7.7% of total loans."

are not currently working for the bank. This is consistent with specifications in Coles, Daniel and Naveen (2008) and Graham, Hazarika and Narasimhan (2011), who focus on non-insiders' role as advisors. We do not focus solely on the proportion of non-insiders because if the number of insiders is stable over time, then changes in non-insiders simply reflect changes in board size. Furthermore, it is interesting to determine the relation between board independence and performance, because this is the measure emphasized in SOX, listing rules and the Dodd-Frank Act.

2.3 BHC board size and performance

The governance literature argues that firms choose board size to balance advisory needs with the costs of decision-making in large groups. Dalton, Daily, Johnson and Ellstrand (1999) argue that large boards may be beneficial because they increase the pool of expertise and resources available to the organization. However, Jensen (1993) argues that as board size increases, boards become less effective at monitoring management because of free-riding problems amongst directors and increased decision-making time. Consistent with Yermack (1996), Coles, Daniel and Naveen (2008) find that firm performance is on average lower for firms with larger boards (regressions not reported, but see Panel A of Figure 2). However, when they interact board size with measures of complexity, they find that firm performance increases in board size for complex firms. Thus, the advisory benefits of larger boards appear to outweigh their costs in complex firms. Their analysis suggests that the reason why the literature has generally found that board size is negatively correlated with performance in samples of non-financial firms is because these samples consist predominantly of relatively simple firms in which the costs of larger boards outweigh the benefits.

In contrast, our sample consists entirely of large banks which can all be considered to be complex. In fact, legislators and regulators specifically identified bank size and complexity as contributing to the financial crisis (e.g. Felsenthal, 2009). For example, large BHCs are organizationally complex, in the sense of having many subsidiaries with their own boards. With more subsidiaries there may be a need for more representatives from subsidiary boards on the BHC board, both to facilitate coordination amongst the different subsidiaries and to facilitate monitoring. These arguments suggest that the average effect of board size on BHC performance may be positive.

However, several factors may counteract the beneficial effects of large boards in complex BHCs. Adams and Ferreira (2011) document that outside directors on large BHC boards have more attendance problems at board meetings than directors in non-financial firms. This

is direct evidence that large BHC boards suffer from free-riding problems, as Jensen (1993) argues. Furthermore, the fact that BHCs have many subsidiary boards makes the role of the parent BHC board in dealing with complexity less clear. If many issues can be dealt with by the boards of subsidiaries, then it is not clear that the size of the parent BHC boards needs to be big in order to provide advice to the CEO. It may also be difficult to staff large BHC boards with sufficiently good directors if regulatory restrictions on subsidiary boards limit the pool of directors from which the BHC can choose. Finally, acquirers may need to appoint directors from targets to their boards as the result of negotiations over terms in friendly M&A transactions (see e.g. Wulf, 2004). If the BHCs in our sample undertook many M&A transactions, their boards may have been larger than optimal. As with board composition, the net effect of board size on performance must be determined empirically.

3 Data

Our primary sample of firms consists of a random sample of 35 publicly traded BHCs which were amongst the 200 largest (in terms of book value of assets) top tier BHCs for each of the years 1986-1996. We collected additional data on these firms for the years 1997-1999 even if they were no longer among the top 200. However, the number of firms drops from 35 to 32 during those years due to M&A activity. The requirement that the firms must be publicly traded made it possible to collect data on board size and composition as well as other internal governance characteristics of the firms from proxy statements. Because of the high cost of hand collecting detailed governance variables, we focus on a relatively small number of BHCs. We obtain balance sheet data from fourth quarter FR Y-9Cs from the Federal Reserve Board and stock price and return data from CRSP.[8] We obtain data on Tier 1 subsidiaries from the Federal Reserve's National Information Center (NIC).

The requirement that data be available on these firms for at least 10 years may introduce a survivorship bias. However, Boyd and Runkle (1993) argue that survivorship bias may not be a serious problem in the banking industry since the FDIC generally does not allow large BHCs to fail. In addition, we allow our firms to enter the sample in an extended data set for the period 1965-1985. Because we impose no restrictions on our sample firms prior to 1986, our analysis of this time period serves as a robustness check that our results are not driven by sample selection. We discuss the extent to which our primary sample can be considered to be representative in more detail in Section 3.2. We present descriptive statistics for our

[8] The governance data is measured on the date of the proxy at the beginning of the corresponding fiscal year. We adjust our data collection procedures to account for the fact that proxies disclose some governance characteristics for the previous fiscal year and others for the following fiscal year.

primary sample first and then describe our historical sample.

3.1 Descriptive statistics 1986-1999

Although various components of the data enter the analysis at different stages, for ease of reference we provide all summary statistics for our primary sample in Table 1.

-Insert Table 1 about here-

3.1.1 BHC characteristics

Our primary measure of performance is a proxy for Tobin's Q, which we define to be the ratio of the firm's market value to its book value of assets. We define the firm's market value as the book value of assets minus the book value of equity plus the market value of equity. We use assets, bank capital volatility and return on assets (ROA) to define control variables. We use data on deposits, Tier 1 subsidiaries, the locations of Tier 1 subsidiaries and subordinated debt to define proxies for complexity in Section 5.2.1.

ROA is the ratio of net income to the book value of assets. Bank capital is the primary capital ratio which we define as the sum of the book value of common stock, perpetual preferred stock, surplus, undivided profits, capital reserves, mandatory convertible debt, loan and lease loss reserves, and minority interests in consolidated subsidiaries minus intangible assets.

Table 1 shows that average Tobin's Q during 1986-1999 is 1.05 and average ROA is 1%. An average BHC has 41.0 billion dollars in assets and primary capital of 8%. BHCs have on average 18.23 Tier 1 subsidiaries that are spread across 4.57 states.

3.1.2 Governance variables

We first describe our primary measures of board structure, board composition and size, as well as changes in these measures. We then describe other governance variables that enter our initial analysis of board structure and performance. Finally, we discuss data related to board changes in M&A transactions and data on subsidiary directorships.

Board composition and size and changes in these measures

We consider a director to be "an insider" if he works for the firm and "affiliated" if he has had any previous business relationship with the firm or family relationship with its officers. Since we follow the BHCs in our sample over a period of at least 10 years, we are able to identify whether any directors are former officers of the BHC (generally the CEO or Chairman). We consider these directors to be insiders. All other directors are outsiders.

Our classification of who is an independent outsider is stricter than in many other studies: a director is not an outsider if he was an officer or had *any* business relationship with the BHC in *any* of the 14 years of the sample. In contrast, most cross-sectional studies can only classify directors based on current employee status or business relationships.

Each BHC has, on average, 18 directors. This compares to a board size of roughly 12 for samples of non-financial firms during the same time period (e.g. Adams and Mehran, 2003). Our BHCs also have a higher percentage of outsiders on the board than many non-financial firms: 69% as compared to 61% in Adams and Mehran (2003) and 54% in Yermack (1996). This is consistent with our arguments in Section 2 that BHCs might optimally have large boards and many outsiders because they are large and complex. On the other hand, as we noted earlier, the proportion of outsiders may overstate the board's true independence if lending relationships with directors or directors' employers exist but are not individually disclosed (see also the discussion in Adams, 2010). On average, our sample BHCs have 80% non-insiders on the board.

Because we use firm fixed-effects in our empirical specifications, we rely on within-firm variation in board composition and size for identification. Thus, it is useful to document variation in these variables. In only 120 (25.59%) firm-years, there is no change in board size; in only 71 (16.36%) firm-years there are no changes in the fraction of outsiders and in only 87 (20.05%) firm-years there is no change in the fraction of non-insiders. Table 1 shows that on average each BHC experiences changes in board size and composition in roughly 10 years. The average change in board size is -0.33. While this appears small, the standard deviation is fairly large, 3.2. As expected, the fraction of non-insiders changes less than the fraction of outsiders.

Other governance characteristics

On average, each board has 4.42 committees and each committee member sits on 1.87 committees. Outsiders chair 62% of the committees and the chair of each committee also is a chair of another committee. The average number of board meetings per year is 8.45, which is close to the 7.45 meetings a year reported by Vafeas (1999), and the average board meeting fee is $994. Nearly 95% of the firms have deferred compensation plans for their directors. Interlocks exist in 39% of the sample. We define an interlock to be a situation where the chairman or the CEO of a BHC is a director in another company whose top management is on the board of the BHC.[9] Each outsider (insider) holds 1.76 (1.49) additional directorships.

[9]Because our sample consists of BHCs, we do not define interlocks within-sample, as many studies of non-financial firms do (e.g. Hallock, 1997). Instead, we check the proxies for reported interlocks, as well as checking reported directorships of the CEO and chairman in the proxy statements for potential interlocks.

CEO ownership is on average 2.27%.

M&A transactions and M&A-related board composition

To examine the role of M&A activity in governance, we examined proxy statements to identify instances in which target directors were added to the board following M&A transactions. On average, each BHC engaged in 2 transactions following which it incorporated target directors. The average number of target directors added to the board was 3.61 and target directors comprised 17% of the merged firm's board at the time of the transaction. In any given year, the proportion of directors who joined the board as the result of a prior M&A transaction is 13% (roughly 3 directors). The proportion of target directors on the acquirer's board at the time of transaction is similar to the 16.5% reported in Wulf (2004) for a sample of 40 mergers-of-equals. Since 15 of her mergers-of-equals involved banks or financial firms, our numbers appear reasonable.

Subsidiary directorships

We collect information on subsidiary directorships from proxy statements. On average 51.1% of the parent BHC's board also sits on the board of the BHC's lead bank. In some cases, e.g. J. P. Morgan, the entire board of the parent sits on the board of the lead bank. For 83.82% of firm years we are able to determine that at least some parent directors sit on the board of the lead bank or another subsidiary. However, it is not clear that subsidiary directorships other than lead bank directorships are consistently disclosed. Thus, we use lead bank directorships as a general proxy for subsidiary directorships. On average the number of parent directors sitting on the board of the lead bank is 7.8, of which on average 5.98 are non-insiders.

All governance characteristics we describe here are those of the board at the BHC level. Because of the holding company structure, they may not be strictly comparable to board characteristics in non-financial firms. For example, directors of BHCs who sit on subsidiary bank boards may be compensated separately for such service, which means their compensation at the BHC level understates the total compensation they receive from the BHC. For example, First Empire State's 1988 proxy states that directors of First Empire State who also sit on the board of its subsidiary, M&T Bank, receive the same meeting fees for attending meetings of both boards. This also means that the number of meetings of the BHC board may understate total interactions among BHC directors. However, it is important to

Of course, our measure of interlocks may still be measured with error to the extent that directorships are not fully disclosed or interlocks are not truthfully reported despite SEC disclosure rules. The same is true for our other governance measures. To the extent that this measurement error is not systematic, then our estimates of the coefficients on our governance measures will be biased towards zero.

note that the holding company structure does not affect the measurement of board size, a primary variable of interest for us. On the other hand, if directors with subsidiary directorships have transactions with subsidiaries, it is possible that they may be considered outsiders from the perspective of the BHC but affiliated from the perspective of the subsidiary. Thus, the holding company structure may exacerbate measurement problems associated with true board independence in banking. However, it will not affect the measurement of the fraction of non-insiders.

3.2 Representativeness of our primary sample

In this Section, we examine to what extent our sample selection procedure calls the representativeness of our primary sample into question. There are two main concerns one might have in this respect. First, because we focus on large BHCs, our findings may not apply to the banking industry as a whole. Second, because we relate governance to performance, we need to examine whether our sample has biased performance and/or governance characteristics. We address these issues in turn.

3.2.1 Representativeness of our sample in terms of the industry

In terms of number of banks, our sample is not representative of the banking industry. Between 1986 and 1999, the number of FDIC-insured commercial banks ranged from 14,199 to 8,580. Moreover, our sample firms are all BHCs. As we describe in Section 2.1, different regulations exist concerning the governance of BHCs, national banks and state banks. Thus, our findings may not be generalizable to banks that are neither BHCs, nor publicly traded. The findings may also not generalize to smaller BHCs. However, the findings may still be relevant to the industry as a whole because the assets of our sample BHCs constitute a large portion of industry assets: 32.3% of total top-tiered BHC assets in 1990. Reflecting increasing consolidation in the industry, this number rose to 50.75% in 1998. As the financial crisis has illustrated, potential governance failures at the largest banks can have serious consequences for the industry and the economy (see e.g. Kirkpatrick, 2009). Thus, even though our sample is not a random sample from the entire population of banks, it does represent a sample of interest for the industry.

3.2.2 Representativeness of our sample in terms of performance and governance

To examine whether our sample is representative in terms of performance and governance characteristics we undertook two steps. First, we examined the stock price performance of our sample firms relative to benchmark portfolios of all other publicly traded commercial

banks (SIC codes 6020-6029 and 6199) available in the CRSP database during 1986-1999. In each case, we excluded the sample firms from the benchmarks. We found that the differences between equal and value-weighted monthly portfolio returns for our sample and the benchmarks were not statistically significant.

Second, we searched for a dataset containing governance data on banks that we could compare our sample to. We chose the Riskmetrics director database for this purpose. This database consists of an unbalanced panel of director-level data for Standard & Poor's (S&P) 1500 firms from 1996 to 2007. Although it overlaps with our sample for only 4 years, we believe it is a useful sample for our purposes since it is a widely used dataset in the governance literature. It also contains a comparable classification of outside directors. We merged this data to Compustat to obtain financial information and SIC codes, which we used to identify banks in conjunction with Riskmetrics' industry classifications. We then constructed a data set which contains assets, Tobin's Q, ROA, board size and the proportion of outsiders for our sample BHCs and the banks in the Riskmetrics dataset from 1996 to 1999. The number of Riskmetrics banks in this sample varies from a minimum of 91 in 1998 to a maximum of 105 in 1999.

To examine whether our BHCs are comparable to the larger banks in the Riskmetrics data, we defined a large Riskmetrics bank to be a bank whose assets were greater than the median assets of all Riskmetrics banks over the period 1996 to 1999. We end with a sample of large Riskmetrics banks that varies in size from 39 to 42 over the years. Although this procedure is ad hoc, the assets of our sample banks are not statistically different from the assets of these large Riskmetrics banks. Thus, this method generates a set of comparable banks in terms of size.

When we examine differences in performance and governance characteristics for our BHCs and the large Riskmetrics banks, we find that there are no statistically significant differences in Tobin's Q (a difference of -0.0054 for our banks with a t-statistic of -0.46), ROA (a difference of 0.0029 for our banks with a t-statistic of 0.05) or proportion of outsiders (a difference of 0.0002 for our banks with a t-statistic of 0.01). On the other hand, our sample BHCs' boards are larger (a difference of 0.9959, essentially one director, with a t-statistic of 1.86). However, it is not clear whether a difference in one director should be considered economically significant compared to the average of 16 directors for large Riskmetrics banks. Furthermore, when we compare our sample banks to the 26 to 28 Riskmetrics banks with assets in the top tercile over the 1996-1999 period, we find that the difference in board size is no longer statistically significant (a difference of 0.4055, with a t-statistic of 0.68) and the

differences in performance and proportion of outsiders remain statistically insignificant.

Although this analysis does not cover our entire primary sample period, we believe it is at least suggestive that our sample is not systematically biased in terms of performance. While the boards of our BHCs may be slightly larger than those of other large banks, it is not clear that our results are biased as a result because our banks do not outperform other banks.

3.3 Descriptive statistics 1965-1985

To ensure that our results using our primary sample are not sensitive to our choice of time frame, we collected additional data on our sample firms from 1965, which was the first year stock price data for our sample firms was available in CRSP,[10] to 1985. For much of this early period the ability of banks to undertake mergers was limited by the Bank Holding Company Act of 1956, which limited the acquisition of control in commercial banks to BHCs, as well as by additional restrictions imposed by state law. The entire period 1965-1999 thus captures times when banking firms were heavily regulated, as well as periods of regulatory change, deregulation and changes in organizational form.

Between 1965 and 1982, 97% of the banking firms in our sample changed their organizational structure to become holding companies. While by 1982 all of our firms were BHCs, only 1 of our publicly traded firms was a BHC by 1969. Thus, in order to follow most of our institutions back in time, we had to determine their predecessor banks. To do this, we used Moody's Bank and Finance Manuals. When Moody's Manuals did not clearly identify the predecessor bank, we chose as the BHC's predecessor its banking subsidiary with the same permno in CRSP or the same CEO as the BHC the year prior to conversion to the BHC form, or the largest subsidiary.

We collected information on board size and composition for the period 1965-1985 from Moody's Manuals, which list the board members and the officers of each firm. Because it is not possible to characterize non-inside directors as affiliated or outside directors, we use the fraction of non-insiders as our measure of board composition. We obtain balance sheet information from either FR Y-9C data or Call Reports. Stock return data is from CRSP.

-Insert Table 2 about here-

Table 2 provides descriptive statistics for the period 1965-1985. Mean Tobin's Q and ROA are 1.00 and 1%, respectively. Average total assets amount to $9.03 billion and the mean equity to asset ratio is 6%. An average board consists of 20 directors, of which 85%

[10] By 1975 all of our firms show up in CRSP.

are non-inside directors.

4 Board structure and performance 1986-1999

We investigate the relation between firm performance as measured by Tobin's Q and board size and composition using OLS regressions. We discuss our empirical specification in Section 4.1. Section 4.2 shows the results.

4.1 Empirical specification

In our basic specification, we follow previous studies (e.g. Yermack, 1996) and regress our proxy for Tobin's Q on the natural logarithm of board size and the proportion of outside directors plus financial controls. The financial controls consist of the natural logarithm of the book value of assets as a proxy for firm size, the capital ratio as a proxy for capital structure, the volatility of stock prices as a measure of uncertainty and lagged ROA. All regressions include year dummies and firm fixed-effects. By including firm fixed-effects, we limit both omitted variable bias and the effect of potential outliers caused by the fact that the number of cross-sectional units in our sample is small. In all specifications, the standard errors are adjusted for potential heteroskedasticity.

Since we have detailed data on other internal governance characteristics of the BHCs in our sample, in expanded specifications we include these variables as governance controls. Since internal governance mechanisms are likely to be ultimately simultaneously chosen, performance regressions that only include board size and composition may suffer from omitted variable bias if other internal governance characteristics are also correlated with performance. For example, Klein (1998) shows that the proportion of insiders on the finance committee is positively related to firm value and Vafeas (1999) finds a negative correlation between the number of board meetings and performance. Since both the committee structure of the board and the number of board meetings are plausibly related to board size and composition, we cannot be sure that we are not picking up spurious correlations between board size, composition and performance if we do not include these additional governance characteristics in our performance regressions.

Since there is little theory to guide us in the selection of the most important internal governance characteristics from the large set of possible characteristics, we make an ad hoc selection of groups of variables that we believe may proxy for the aspects of governance that the literature has emphasized most. Our first group of variables consists of committee characteristics: the natural logarithm of the number of committees, the average number

of committee seats per committee member, the proportion of committee chairs that are outsiders and the average number of committee seats per committee chair. Our second group of variables includes additional proxies for board/director activity: the natural logarithm of the number of board meetings, the fee directors get paid for attending board meetings and the average number of other directorships outside and inside directors have.

Our last group of variables consists of variables related to director interlocks and CEO and director compensation. Hallock (1997) argues that interlocks may be representative of a dual agency problem. On the other hand, authors in the organizational literature argue that interlocks are beneficial since they may reduce the information uncertainty created by resource dependence amongst firms (e.g. Pettigrew, 1992). While the predicted sign of the correlation between performance and interlocks is unclear, it is plausible that a correlation exists. There is also a vast literature that argues that the percentage of CEO ownership is correlated with Tobin's Q (e.g. Morck, Shleifer, Vishny, 1988; McConnell and Servaes, 1990). Some studies have found a positive relation between CEO shareholdings and both Tobin's Q and ROA (e.g. Mehran, 1995). Others have argued that director compensation should also affect performance (e.g. Brick, Palmon and Wald, 2006). Thus, our final set of internal governance controls consists of a dummy indicating whether a board interlock exists, the proportion of shares held by the CEO and dummies indicating whether the BHC pays the directors deferred compensation or deferred stock.

4.2 Empirical results

Table 3 presents OLS regression estimates of the relation between Tobin's Q and board size and composition plus controls. In column I, we present the basic regression using only financial controls. In column II, we replicate this specification using Board size instead of Ln(Board size). This serves as a robustness check that our choice of functional form is not driving the results. Moreover, we will use it as a benchmark for analyzing additions to the board following M&A activity in Section 5.[11]

In columns III, IV and V we sequentially add the committee characteristics, the board activity controls and the interlock and compensation variables to the regression. In column VI, we replicate the specification in column IV using the fraction of non-insiders instead of the fraction of outsiders. In column VII, we again show results for Board size instead of

[11] In Section 5, we analyze two components of board size separately: the number of directors added following an M&A transaction (x) and all others (y). Since $\alpha \log x + \beta \log y = \log x^{\alpha} y^{\beta}$ and we have no justification for examining a board size measure of the form $x^{\alpha} y^{\beta}$, it does not make sense to use log board size measures in those specifications.

Ln(Board size). As is evident from Table 3, board size, regardless of how it is measured, has a positive and statistically significant (at greater than the 10% level) correlation with Tobin's Q in six out of the first seven specifications. Board composition, on the other hand, has no significant relation with Tobin's Q, regardless of how it is measured.[12]

-Insert Table 3 about here-

The latter finding is consistent with previous studies of board composition. For example, Hermalin and Weisbach (2003, abstract) summarize the findings of the board structure literature as follows: "Across these studies, a number of regularities have emerged-notably, the fact that board composition does not seem to predict corporate performance, while board size has a negative relationship to performance." The explanation for this finding may be different than in prior literature given the measurement error problem we point out above. However, the fact that there also appears to be no relationship between the fraction of non-insiders and performance suggests that measurement error is not the only reason for the insignificant coefficient on the fraction of outside directors. It is possible that regulatory restrictions on subsidiary boards that also influence board composition of the parent board counteract beneficial effects of independent boards. Regardless, there appears to be little evidence that our sample banks systematically make board composition choices that are detrimental to shareholder value.[13]

Our finding of a positive relation between the logarithm of board size and Tobin's Q is more interesting. It is consistent with the findings in Coles, Daniel and Naveen (2008) and Graham, Hazarika and Narasimhan (2011) that performance increases in board size for complex firms. Thus, on average the costs associated with free-riding behavior of directors on large BHC boards (e.g. Adams and Ferreira, 2011) do not seem to outweigh the beneficial effects of large boards in BHCs. This does not mean they do not matter at all. The results for Ln(Board size) suggest that the beneficial effect of board size may decline as boards get larger. The marginal effect of an increase in board size is given by the regression coefficient on Ln(Board size) divided by board size. Since the coefficient is constant, the effect of board size decreases as board size increases. For example, using the coefficient on Ln(Board size) of 0.019 from column IV of Table 3, we estimate the effect of an increase from 5 to 6 board members to be 0.38% and the effect of an increase from 20 to 21 members to be 0.095%.

Although this suggests there may be decreasing returns to board size, this conclusion may simply be driven by our choice of functional form. Thus, we also investigate whether

[12] Our results are similar if we use the natural logarithm of Tobin's Q as the dependent variable.

[13] Our results are similar if we use ROA as a measure of performance. We omit those results for the sake of brevity, but they are available in the unpublished appendix of this paper.

there is any evidence of decreasing returns to scale in board size using a piecewise linear specification. We divide board size into its terciles of 8-15, 16-20 and 21-36 directors and allow for different intercepts on the terciles. Using the same control variables as in column VII, we find in column VIII that although the coefficients on all terciles are positive, only the coefficient on the third tercile is significant (at the 10% level). However, the magnitude of the coefficient on the first tercile is higher than the magnitude of the coefficient on the third tercile by 11.66%. When we replicate the piecewise linear specification using quartiles and quintiles of board size, we find a similar pattern although the differences in magnitude are more extreme.[14] These results suggest that there may be decreasing returns to board size, at least when comparing the extremes.

The coefficients on the financial control variables are consistent with results from other papers. Since there is little theory that would guide our predictions for the signs of the coefficients on most of the internal governance controls, we merely state the results that are consistent across specifications. In Table 3, there is a positive and significant relationship between performance and the size of the board meeting fee. This is consistent with Adams and Ferreira (2011), who document that the attendance behavior of BHC directors improves as board meeting fees increase. There is a negative and significant relationship between performance and the natural logarithm of the number of committees, the average number of external directorships held by officers of the BHC as well as by outside directors, interlocks, the deferred stock dummy and CEO ownership. While we find the results for the other governance controls suggestive, we caution against interpreting them as consistent with a particular theory that does not concern board structure in BHCs.

5 What drives the positive coefficient on board size?

We investigate our findings in more detail to see if the factors driving the relationship between board size and performance are plausible. If so, we can have more confidence that it might be causal. The two factors we investigate are M&A activity and complexity.

[14] The quartiles are 8 to 14, 15 to 18, 19 to 21, 22 to 36. The quintiles are 8 to 13, 14 to 16, 17 to 19, 20 to 22, 23 to 36. The magnitude of the coefficient on the first quartile is more than four times the magnitude of the coefficient for the 4th quartile and the magnitude of the coefficient for the first quintile is more than ten times the magnitude of the coefficient for the 5th quintile. The difference in coefficients is significant only for quartiles. There may not be enough variation in board size in each category to achieve statistical significance as the percentiles get larger.

5.1 The role of M&A activity

The summary statistics in Table 1 show that it is not uncommon for M&A transactions to lead to expansions in board size. If target directors serve a valuable advisory role in the transition to a larger corporation, we would expect variables related to the addition of target directors to the board to have positive coefficients in performance regressions.

-Insert Table 4 about here-

We examine this in columns I and II of Table 4, where we replicate the regression in column IV of Table 3 after including two different variables which proxy for instances in which target directors were added to the board. The first variable is a dummy variable, "Addition to Board following M&A", which is equal to 1 if the proxy statement indicated that directors joined the board following an M&A transaction in that year. Although we were careful to examine directors' biographies for all years to see whether they were identified as former target directors, it is possible that some proxy statements did not disclose this information. Thus, we also define a dummy variable "Potential M&A additions", which is equal to 1 if board size increased by 3 or more directors in a given year, but the proxy did not identify these directors as target directors. There were 21 such events.[15] For the sake of brevity, we suppress the coefficients on all but the coefficients of interest.

The coefficient on "Addition to Board following M&A" in column I is not significant and the coefficient on "Potential M&A additions" in column II is significant at the 10% level, but negative. In addition, the coefficients on Ln(Board size) are very similar to those in Table 3, both in magnitude and significance. This suggests that the addition of target directors to the board is neither value-enhancing on average, nor the main reason why board size is positively related to performance. To examine this issue in more detail we replicate the specification in column VII of Table 3 after dividing Board size into the number of non-M&A directors and the number of M&A directors. In column IV, we report the same regression using the fraction of non-insiders instead of the fraction of outsiders. As is evident from both columns, the relationship between performance and "Number non-M&A directors" is positive and significant in both specifications, while the coefficient on "Number M&A directors" is not significant. Moreover, the coefficient on "Number non-M&A directors" is 0.001, which is exactly the same as the coefficient on board size in column VII of Table 3. Thus, it appears as if the positive coefficient on board size is not driven by the addition of target directors who perform a valuable advisory and monitoring role.

[15] We chose 3 directors as the cutoff because it is approximately equal to the average number of target directors who joined the board in events identified in proxy statements.

These regressions also suggest that our board size finding is not a spurious relationship driven by omitted variables relating to M&A activity. It is plausible that M&A activity is correlated with performance if firms only undertake M&A activity when their Q is high or merge with high Q firms, so that post-merger Q increases. Since M&A activity is also correlated with board size, the omission of variables related to M&A activity could lead to a spurious positive coefficient on board size in performance regressions. Since we control for M&A additions to boards in these regressions, our findings do not appear to be the result of omitted M&A activity.

While the addition of M&A directors to boards does not appear to be value-enhancing, the existence of an active market for corporate control could lead boards to become more effective. It is also possible that there are other interdependencies between M&A activity, board size and performance that we have not controlled for. To address these issues, we examine whether we obtain different results in our data from 1965-1985.

-Insert Figure 1 about here-

Before turning to our performance regressions, it is instructive to examine the broad patterns in board size and composition over the 34 years for which we have data. Figure 1 shows average board size and the average ratio of non-inside directors from 1965-1999. Clearly, board size has been declining. This is the case despite the arguably increasing complexity of the sample firms over time.[16] The difference in board size pre- and post-1986 is also significant. In the earlier period, our sample firms had on average 2.6 more directors, a difference that is significant at less than the 1% level. Because the market for corporate control was more active post-1986, this evidence is not consistent with the idea that M&A activity drives our results. The downward trend in board size does not seem to be accompanied by any major changes in board composition. Confirming the visual evidence, the proportion of non-inside directors is by any standard not significantly different pre- and post-1986.

-Insert Table 5 about here-

In Table 5 we examine whether the relationship between Tobin's Q and board size and composition is different pre- and post-1986. All regressions include the same financial controls as before, but, as it is difficult to obtain proxy statements prior to 1986, not the same governance controls. Because data on all components of primary capital are not available

[16]The trend is consistent with the decline in board size for large manufacturing firms documented by Linck, Netter and Yang (2008), which they suggest may be due to institutional activism. However, it is fair to say that the drop in banking firm board size started before the publicized pressure on boards by institutional shareholders.

prior to 1986, we use the ratio of the book value of equity to the book value of assets as a proxy for the capital ratio. All regressions include firm fixed-effects and the standard errors are adjusted for heteroskedasticity. Since only 9 firms were listed in CRSP by 1972, we include year dummies only for all years after 1973. In column I of Table 5, we present the results using the full sample of data from 1965-1999. In column II, we also include the ratio of non-insiders. We replicate these specifications using only the data prior to 1986 in columns III and IV.

As before, the coefficient on the fraction of non-insiders is not significantly different from zero. As in Table 3, the coefficient on Ln(Board size) is always positive and significant (at greater than the 5% level). Moreover, the magnitudes of the coefficients are similar to those in Table 3. To examine whether large boards appear to be becoming more effective over time due to an increasingly active market for corporate control, in columns V and VI we omit the year dummies but include the year as a control variable along with the interaction of the year with Ln(Board size). The coefficient on the interaction term is negative and significant at the 5% level, which suggests that the relationship between board size and performance is becoming weaker over time, not stronger.[17]

We conclude that although M&A activity influences bank board composition, M&A activity does not appear to be the main explanation for our performance results. The non-negative relation between board size and Tobin's Q exists even prior to the increase in consolidation in the banking sector. We turn to the possible role of complexity in explaining the positive coefficient on bank board size next.

5.2 The role of BHC complexity

Our results from the previous Section do not seem consistent with the idea that complexity matters for board size. Over time, banks are becoming larger and arguably more complex, yet Figure 1 shows that board size is decreasing over time. Moreover, larger boards are not more valuable over time. Nevertheless, complexity can still help explain the positive relation between board size and performance. First, banks will learn to deal with complexity over time, which means that the value of a large board need not be uniformly increasing in complexity. Second, examples of statements made in BHC proxy statements suggest to us that BHC structure, or organizational complexity, affects board structure. For example, U.S. Bancorp's proxy statement in 1988 (p. 4) states:

[17] Our results may seem contradictory to Shranz (1993) who finds that bank board effectiveness improves with an active market for corporate control, however, her results are cross-sectional, while our results focus on within-firm changes over time.

> Since the formation of Bancorp in 1968, Bancorp and USNB [United State National Bank of Oregon] have shared a common board of directors. With the evolution of Bancorp into a regional multi-bank holding company and the creation of U.S. Bank of Washington, National Association, it is no longer practical to have common board membership. Therefore, certain members of the common board have been nominated to serve on the smaller Bancorp Board. The remaining board members of the common board will continue to serve as members of the board of USNB. A strong representative board is also in place at U.S. Washington. This structure provides the broad geographic representation and diversity that is desirable at the bank board level while a smaller group can address the more strategic role of a holding company board. Mr. Breezley will continue to serve on all three boards to facilitate cooperation and communication among them.[18]

As this quote suggests, the need to coordinate activities amongst separate subsidiaries in a holding company may affect board structure. If boards are relatively large because they include directors, such as Mr Breezley in the quote above, who fulfill specific functions in dealing with organizational complexity, then this may explain why large boards add value in banks.

To examine the role of complexity, we first follow previous literature in examining whether large boards are generally more valuable as BHCs become more complex. We then explicitly analyze the role of directors such as Mr. Breezley in dealing with complexity.

5.2.1 Are large boards more valuable in more complex banks?

The main dimensions of complexity the literature on board size stresses are complexity of operations, as proxied primarily by firm size, business and geographic diversification, as proxied by the number of segments, and complexity of financial structures, as proxied by leverage (e.g. Coles, Daniel and Naveen, 2008; Graham, Hazarika and Narasimhan, 2011; Linck, Netter and Yang, 2008).

We proxy for operational complexity using firm size and the number of Tier 1 subsidiaries of the bank. We argue that the larger the number of subsidiaries in the first tier, the more operationally complex the BHC as a whole, since many Tier 1 subsidiaries will themselves own further subsidiaries. We use total bank deposits as a proxy for operational complexity since attracting deposits is a decentralized activity for which banks need branches and operations in many states. As a result they need to deal with markets and regulations across multiple jurisdictions. Because banks do not operate in several industries, we proxy for diversification using the number of states the Tier 1 subsidiaries are located in.

[18] "Bancorp" here refers to the top level BHC. USNB was its primary subsidiary bank until the creation of U.S. Bank of Washington, N.A.

Because banks are all highly levered, we do not believe it makes sense to use leverage as a measure of complexity of the financial structure. Instead, we use the ratio of subordinated debt to total assets. Prior literature argues that firms need larger boards when they are more levered because of the necessity of dealing with the suppliers of external finance. As John, Mehran and Qian (2010) describe, the holders of subordinated bank debt tend to be institutional investors. It is more plausible that banks need directors to deal with institutions than with depositors, who are the main suppliers of external bank capital.

For all measures of complexity, we reestimate the specification in column IV of Table 3 after including the measure of complexity and the interaction between Ln(Board size) with the measure of complexity. Except for the coefficient on the interaction with subordinated debt, which is positive and significant at the 10% level, the coefficients on all interaction terms are insignificant. The results are similar after performing various robustness checks. Thus, we do not report the results here for the sake of brevity.[19]

Our results do not provide support for the idea that large boards per se add value because they help bank management deal with complexity. It is possible that our results differ from those in Coles, Daniel and Naveen (2008) and Graham, Hazarika and Narasimhan (2011) because we use firm fixed-effects and there is not enough within-firm variation in complexity to identify an effect on the interaction terms. It is also possible that only directors who sit on subsidiary boards play a special role in dealing with complexity. We examine this issue next.

5.2.2 The role of directors sitting on subsidiary boards

In Table 6, we examine the role of subsidiary directorships. In columns I-V, we decompose board size into directors who do and do not sit on the lead bank board, thus our baseline specification is as in column VII of Table 3. In all specifications we also control for the number of Tier 1 subsidiaries because subsidiary directorships are likely to be highly correlated with the number of subsidiaries. We suppress the coefficients on all but the variables of interest for the sake of brevity.

In column I, we test whether directors with subsidiary directorships fulfill a special role in dealing with organizational complexity of the BHC. We separate board size into the number of directors sitting on the board of the lead bank and the number who do not and include the interaction between the former and the number of Tier 1 subsidiaries. In this specification we consider the number of directors sitting on the board of the lead bank to

[19] The results are available in the unpublished appendix of this paper.

be a proxy for the number of directors sitting on subsidiary boards.[20] The coefficient on the interaction term is positive and significant at the 5% level. To examine whether directors with subsidiary directorships appear to add value as other measures of complexity increase, we replace the interaction term in column I with the interactions between the number of parent directors with lead bank directorships and Ln(Assets), Total deposits, Number of states and Subordinated debt/Assets in columns II-V. All the interaction terms are positive and significant at greater than the 5% level. This is in marked contrast to the insignificance of the (unreported) interactions between Ln(Board size) and our complexity measures.[21]

Our conclusion is that in BHCs larger boards do not necessarily increase value because they help deal with complexity. However, they may increase value when they contain a larger number of directors who also sit on subsidiary boards. Consistent with this idea, we find in column VI of Table 6 that if we replicate the specification in column IV of Table 3 after replacing Ln(Board size) with Ln(Number lead bank directorships) and adding the number of subsidiaries, the coefficient on Ln(Number lead bank directorships) is positive and significant at greater than the 5% level. At least part of the positive effect of Ln(Board size) seems to be driven by directors with subsidiary directorships.

The quote at the beginning of this Section suggests that directors with subsidiary directorships add value because they facilitate cooperation and communication among the various banks in the holding company. As an additional test of this idea, we reexamine the role of M&A directors. Coordinating the activities of subsidiaries may be particularly difficult when these subsidiaries are newly acquired banks or BHCs because they may have had different management and operational styles from those of the acquirer. Because M&A directors are familiar with the operating style of the acquired bank, we expect them to be particularly valuable in helping coordinate subsidiary activities. We examine this by decomposing board size into the number of non-M&A directors and the number of M&A directors who do not sit and those who do sit on the board of the lead bank. We then replicate the regression in column VII of Table 3 using this decomposition and including the interaction between the number of M&A directors who sit on the board of the lead bank with the number of Tier 1 subsidiaries. As before, we consider directorships on the lead bank board to be a proxy for subsidiary directorships. We find that the coefficient on the interaction term is significant

[20] We believe it is more likely that directors will have subsidiary directorships if the proxy discloses that at least some of them have lead bank directorships.

[21] To ensure the differences in results are not just driven by changes in functional form and the addition of the number of subsidiaries to the regression, we replicated our results in Section 5.2.1 using Board size instead of Ln(Board size) and including the number of subsidiaries and the results were similar, i.e. the interaction terms were not significant.

in column VII. Thus, although Table 4 suggests that M&A directors do not add value in general, M&A directors with subsidiary directorships appear to add value as organizational complexity increases. This is consistent with the idea that subsidiary directorships serve a coordinating role.

6 Conclusions

Recent proposals for improving bank governance (e.g. Walker, 2009) suggest that bank governance structures are ineffective because they differ from those of non-financial firms. Because there is relatively little research on the governance of banking firms, such comparisons may be inevitable. This paper adds to the bank governance literature by examining the relationship between bank performance and two features of board governance in which banks consistently differ from non-financial firms, board composition and size. Using 34 years of data, we find that banks do not appear to be systematically choosing ineffective governance structures. Board composition has little relationship with performance, consistent with findings for non-financial firms. However, we caution that measurement error due to unobserved lending relationships may confound the interpretation of this result. Board size and performance are positively related. This result does not appear to be driven by omitted variables related to M&A activity. We provide evidence suggesting that one possible explanation for this result is that larger boards have more directors with subsidiary directorships. These directors may be particularly suited to deal with organizational complexity.

We are unaware of any prior literature on the role of subsidiary directorships. One reason for this may be that they are less important in non-financial firms. Non-financial firms are often organized along functional or divisional lines, none of which need have a separate legal identity. In these firms, the coordination of activities between functions may occur through means other than through boards. Although more research needs to be done on the role of subsidiary directorships and lending relationships, our analysis suggests that banks have special governance features that need to be taken into account when designing governance reform proposals.

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Appendix

This appendix contains information that did not make it into the accepted version of this paper (at the *Journal of Financial Intermediation*). It consists of the IV analysis we refer to in the Introduction plus the tables showing that our results are similar with ROA (see Section 4 and Appendix Table 3) and that complexity alone does not drive our results (see Section 5 and Appendix Table 2).

Board structure and performance-IV analysis

While the positive relationship between board size and performance is consistent with arguments concerning the benefits of large banks in complex firms, we cannot give this finding a causal interpretation without first investigating whether endogeneity due to reverse causality is driving our results. It is possible, for example, that CEOs of BHCs like to increase board size because this increases their personal business networks. It may also help them increase their control as Jensen (1993) argues. Since potential directors presumably prefer to join boards of firms that are performing well, we would observe board size increasing when BHCs perform well. Thus, the positive coefficient on board size in our performance regressions may be picking up a causal relationship from performance to board size rather than the other way around. In order to address this endogeneity problem, we need an instrumental variable that is correlated with board size but uncorrelated with performance except through variables already included in our regression. In the context of governance regressions it is usually difficult to come up with valid instruments, because the factors that are arguably most correlated with the endogenous variable are other governance or firm characteristics that are already (or should be) included in performance regressions. For example, Eisenberg, Sundgren and Wells (1998) use firm age and group membership as instruments for board size in performance regressions in a sample of Finnish firms, but they originally argued that both firm age and group membership should be control variables in their performance regressions, which means their instruments are invalid by construction. Coles, Daniel and Naveen (2008) also address the endogeneity of board size in their performance regressions using three-stage least squares, but they do not discuss the validity of their instruments for board size, which are firm age and CEO characteristics, such as tenure. Lehn, Patro and Zhao (2008) use 5-year lagged performance as an instrument for board size, but lagged performance is potentially correlated with performance.[1] Thus, our approach to finding an instrument is to

[1]Many authors have used 2SLS or instrumental variable analysis to address the endogeneity of board structure in regressions, but not all of these focus on performance, e.g. Mak and Li (2001) or board size (e.g.

consider only variables that, to our knowledge, previous literature has not yet considered as explanatory variables in performance regressions. Finding an instrument is further complicated in the context of fixed-effect regressions, because we require a variable with sufficient variation over time.

As our instrument for board size, we propose a measure of flight availability to airports in the cities in which BHC headquarters are located. Our reasoning is as follows. Board size is a measure of the advice available to CEOs (Boone, Fields, Karpoff and Raheja, 2007; Coles, Daniel and Naveen, 2008; Graham, Hazarika and Narasimhan, 2008; Lehn, Patro and Zhao, 2008; Linck, Netter and Yang, 2008). As such, board size should vary with the cost of recruiting advisors.[2] As flight availability increases, it will be easier for directors to attend board meetings at BHC headquarters making them more willing to accept directorships at the BHC. Thus, the cost of recruiting suitable advisors should go down as flight availability increases.

Flight availability could lead to either increases or decreases in board size. On the one hand, as flight availability increases, the BHC can recruit more advisors at lower cost. This suggests that board size should increase as flight availability increases. On the other hand, there may be a substitution effect because it is easier to recruit better directors as flight availability increases. Thus the board need not be so large when it consists of better directors. However, for our purposes, the sign of the correlation between flight availability and board size does not matter. It is sufficient that they are correlated, which we will test below.

To be a good instrument, it is not sufficient for flight availability to be correlated with board size. We require that flight availability is also uncorrelated with Tobin's Q. We believe it is plausible that flight availability is uncorrelated with performance. One could argue that flight availability is a measure of location and that location matters for performance. However, since we use firm fixed-effects in our specifications, we already control for location. It is difficult to imagine other reasons why flight availability to the BHC headquarter city might be correlated with Tobin's Q.

To measure flight availability in a given year, we use the total number of passengers flying in and out of all airports in the BHC's headquarter city during that year.[3] We argue that

Bhagat and Black, 2001). Thus, we do not discuss these other papers in more detail here. Graham, Hazarika and Narasimham (2011) address endogeneity of board structure by essentially using the Great Depression as a natural experiment.

[2]Similar arguments can be made about the cost of recruiting monitors.

[3]Our results are similar if we use only the total number of passengers flying in or the total number of passengers flying out as instruments. On average mean passengers flying in and out of BHC headquarter

the more passengers fly in and out of local airports, the easier it must be for BHC directors to find flights to attend board meetings. We obtain data on the number of passengers traveling through airports from the Air Carrier Statistics database, also known as the T-100 database, which contains domestic and international airline traffic information. This data is compiled by the Bureau of Transportation Statistics from monthly traffic reports (T-100 forms) filed by domestic and international airlines. Unfortunately, this data is only available from 1990 onward. Thus, while we believe our instrument has many advantages in terms of its uniqueness in the literature and its arguable exogeneity, the disadvantage of using it in our context is that our sample size is reduced in our instrumental variable (IV) regressions. Nevertheless, we believe the results in our reduced sample are still informative.

To address the fact that reverse-causality may be driving the results in Table 3, we reestimate our specifications in Appendix Table 1 using IV techniques. For simplicity of exposition, we report results only for column IV of Table 3. This specification is rich in terms of control variables while relying on more observations than the specification in column V. To assess whether the reduction in sample size affects our results, we first report fixed-effect estimates of the specification in column IV of Table 3 restricted to the 1990-1999 time period in column I of Appendix Table 1. The coefficient on Ln(Board size) is still positive, although, not surprisingly given the reduction in the number of observations, less significant. In column II of Appendix Table 1, we report the first stage regressions of Ln(Board size) on all the explanatory variables from the first column, including year dummies and firm fixed-effects, and our instrument Total Passengers.[4] The coefficient on Total Passengers is positive and significant at greater than the 5% level. Thus, it satisfies the necessary condition for an instrument that it is highly correlated with Ln(Board size). The positive coefficient indicates that boards increase in size when it is easier for directors to attend meetings, i.e. BHCs appear to recruit more advisors.

-Insert Appendix Table 1 about here-

In column III, we report the second stage of our IV estimation. In column IV, we report the second stage of our IV estimation using the fraction of non-insiders instead of the

cities is 18,838,964 with a standard deviation of 14,685,263.

[4]The headquarters for Wachovia Corporation are in Winston-Salem, North Carolina. While Winston-Salem has an airport, it is very small. In some years, the T-100 database reports no numbers for Winston-Salem and on average Total Passengers is equal to 43.3. To account for this, we examine two variations of our instrument. The first sets the missing observations for Winston-Salem equal to 43.3, the average over our time period. The second sets Total Passengers equal to the sum of passengers for Charlotte/Douglas International Airport, located 73 miles away in Charlotte, North Carolina, and Raleigh-Durham International Airport, located 83 miles away in Raleigh-Durham, North Carolina. Our results are similar using these two variations of our instrument.

fraction of outsiders. The coefficient on Ln(Board size) is not significantly different from zero in either column. This is a common problem with IV estimation (e.g. Wooldridge, 2002). If endogeneity of Ln(Board size) is a serious problem in performance regressions for our sample, then we would have to rely on our IV-estimates, from which we would have to conclude that there is no relationship between Tobin's Q and Ln(Board size). On the other hand, if endogeneity is not a serious problem, then we can safely rely on the OLS estimates. To test whether Ln(Board size) is correlated with the error term of our performance regression, we perform a Hausman test. The test statistic for the null that Ln(Board size) is uncorrelated with the error term is -0.31 in column III and -0.32 in column IV. Thus, we cannot reject the null. This suggests that once we control for the governance and firm characteristics in our regressions, as well as firm fixed-effects, endogeneity of board size due to reverse causality is not a serious concern in our performance regression, at least for the 1990-1999 period. Thus, the fixed-effect specification in column I suggests that there is a positive causal effect of board size on performance for this period.

Our conclusions in this Section depend critically on the quality of our instrument. Although we believe that our instrument is plausibly exogenous, we try to increase confidence that board size may have a beneficial effect on performance by investigating possible sources of this positive effect in the main body of the paper.

Appendix Table 1
Instrumental Variable Regressions of Tobin's Q on Board Structure plus Controls

Column I of Table 1 replicates the regression in column IV of Table 3 after restricting our sample to the years for which our instrument is available: 1990-1999. Column II shows the first stage regression of Ln (Board size) on all explanatory variables from column I, including year dummies and firm fixed effects, and our instrument: Total passengers. Column III shows the second stage of our firm fixed-effect IV regressions of Tobin's Q on Ln (Board size) with Total passengers as the instrument for Ln (Board size). Total passengers is the sum of all passengers flying in and out of all local airports in the city of the BHC's headquarters according to data we obtain from the Air Carrier Statistics database compiled by the Bureau of Transportation Statistics. This data is only available from 1990 onward. Table 1 describes the sample and the control variables further. All specifications include year dummies and firm fixed-effects. The Hausman test statistic for the hypothesis that Ln (Board size) is uncorrelated with the error term of the performance regression is reported in the last row. The number of observations is 305 in all columns. Absolute values of robust t/z-statistics are in brackets. Significance levels: (***)-1% (**)-5% (*)-10%.

	Dependent Variable: Tobin's Q	*Dependent Variable: Ln (Board size)*	*Dependent Variable: Tobin's Q*	*Dependent Variable: Tobin's Q*
	I	II	III	IV
Ln (Board size)	0.024*		-0.005	-0.006
	[1.70]		[0.05]	[0.06]
Fraction of outside directors	0.03	0.433***	0.042	
	[0.85]	[2.81]	[0.79]	
Fraction of non-insiders				0.077
				[0.90]
Ln (Number committees)	-0.041**	0.241***	-0.033	-0.034
	[2.46]	[2.94]	[1.07]	[1.10]
Committee members / Number committees	0.014	0.100**	0.017	0.016
	[1.24]	[2.08]	[1.16]	[1.13]
% Outside chair	7.41e-6	-0.002***	-5.01e-5	-8.34e-6
	[0.04]	[3.10]	[0.20]	[0.04]
Avg. number committees per chair	-0.008	-0.187***	-0.014	-0.013
	[0.75]	[3.57]	[0.64]	[0.62]
Ln (Number board meetings)	-0.007	0.043	-0.005	-0.008
	[0.59]	-0.82	[0.41]	[0.64]
Meeting fee	0.000*	-4.76E-05	7.04e-6	5.99e-6
	[1.68]	[1.45]	[0.74]	[0.58]
Avg. other directorships for outsiders	-0.004	-0.04	-0.005	-0.004
	[0.70]	[1.64]	[0.79]	[0.69]
Avg. other directorships for insiders	-0.006**	-0.014	-0.007*	-0.008*
	[2.09]	[0.91]	[1.80]	[1.81]
Ln (Assets)	-0.014	-0.052	-0.015	-0.014
	[0.99]	[0.86]	[1.07]	[1.05]
Capital ratio	0.936**	-2.025*	0.880***	0.913***
	[2.56]	[1.87]	[2.89]	[3.17]
Volatility	-0.014	0.189	-0.009	-0.005
	[0.12]	[0.37]	[0.07]	[0.04]
Lagged ROA	0.987	0.922	1.004*	1.073**
	[1.50]	[0.39]	[1.88]	[1.97]
Total passengers		5.730E-09**		
		[2.39]		
Constant	1.248***	3.481***	1.340***	1.304***
	[4.70]	[3.14]	[3.43]	[3.56]
R-squared	0.806			
Regression Type	Firm fixed-effect, 1990-1999	First-stage regression	Fixed-effect IV regression	Fixed-effect IV regression
Hausman test statistic			-0.31	-0.32

Appendix Table 2
Board size and complexity

Table 2 examines whether larger boards add more value as complexity increases. Column I replicates the fixed effect Tobin's Q regressions in column IV of Table 3 after including the interaction between Ln(Board size) and Ln(Assets). Column II replicates the specification in column I after replacing Board size with the Number of non-insiders. Column III replicates the fixed effect specification in column II of Table 5 after including the interaction between Ln(Board size) and Ln(Assets). All other columns replicates the fixed effect Tobin's Q regressions in column IV of Table 3 after including the interaction between Ln(Board size) and different measures of complexity, as well as the complexity measures. Tobin's Q=(book value of assets+market value of equity-book value of equity)/book value of assets. Tables 1 and 2 describe the samples and the control variables further. All regressions control for the corresponding additional controls in either column IV of Table 3 (Ln (Number committees)-Lagged ROA) or column II of Table 5 (LN(Assets)-Lagged ROA) that are not reported here for the sake of brevity. All specifications include year dummies and firm fixed-effects. The number of observations is 444 in all columns. The coefficient on the constant term is omitted for the sake of brevity. Absolute values of robust t-statistics are in parentheses. Significance levels: (***)-1% (**)-5% (*)-10%.

	Dependent Variable: Tobin's Q						
	I	II	III	IV	V	VI	VII
Ln (Board size)	0.208		-0.024	0.017	0.016	0.017	-0.003
	[1.29]		[0.48]	[1.06]	[1.21]	[1.07]	[0.26]
Ln (Number of non-insiders)		0.204					
		[1.50]					
Ln (Board size)*Ln (Assets)	-0.011		0.002				
	[1.18]		[0.68]				
Ln (Number of non-insiders)* Ln (Assets)		-0.011					
		[1.39]					
Ln (Board size)*Number Tier 1 subsidiaries				-1.73e-4			
				[0.30]			
Ln (Board size)*Total deposits					11.21e-10		
					[0.40]		
Ln (Board size)*Number of states						-0.002	
						[0.90]	
Ln (Board size)*Subordinated debt/Assets							1.431*
							[1.82]
Fraction of outside directors	0.006			0.009	0.01	0.009	0.008
	[0.28]			[0.43]	[0.46]	[0.43]	[0.40]
Fraction of non-insiders		0.017	0.017				
		[0.56]	[0.90]				
Number Tier 1 subsidiaries				3.721e-4			
				[0.22]			
Total deposits					2.79e-10		
					[0.33]		
Number of states						0.008	
						[1.13]	
Subordinated debt/Assets							-3.448
							[1.49]
Additional controls	As in column III, Table 2		As in column II, Table 5	As in column III, Table 2			
Observations	444	444	929	442	442	442	442
R-squared	0.799	0.801	0.746	0.796	0.796	0.798	0.803

Appendix Table 3
Fixed Effect Regressions of ROA on Board Structure and Controls

Table 3 presents fixed effect regressions of ROA on board size, board composition and controls. ROA=net income/book value assets. Number lead bank directorships is the number of parent BHC directors sitting on the board of the lead bank. Number M&A directors with lead bank directorships is the number of parent BHC directors who joined the board as a result of an M&A transaction who also sit on the board of the lead bank. A non-insider is defined to be any director who is not currently an officer of the banking firm headquarters. Table 1 describes the variables in more detail. All specifications include year dummies and firm fixed-effects. The number of observations in all columns is 442. The coefficients on the constant term are omitted for the sake of brevity. Absolute values of robust t-statistics are in parentheses. Significance levels: (***)-1% (**)-5% (*)-10%.

	Dependent Variable: ROA		
	I	II	III
Board size	1.6e-5		
	[0.27]		
Number lead bank directorships		0.000**	
		[2.00]	
Number directors w/o lead bank directorships		-1.1156e-4	
		[1.49]	
Number non M&A directors			-9.32e-6
			[0.15]
Number M&A directors with lead bank directorships			0.000**
			[2.06]
Number M&A directors w/o lead bank directorships			1.535e-4
			[1.11]
Fraction of outside directors	-0.001	-3.775e-4	-0.001
	[0.43]	[0.14]	[0.19]
Ln (Number committees)	-0.001	-0.001	-0.001
	[0.49]	[0.50]	[0.74]
Committee members / Number committees	0.001	0.001	0.001
	[1.49]	[1.38]	[1.60]
% Outside chair	9.82e-6	1.42e-5	9.28e-6
	[0.78]	[1.11]	[0.74]
Avg. number committees per chair	-0.001	-2.25e-4	-0.001
	[0.76]	[0.29]	[0.70]
Ln (Number board meetings)	-0.003***	-0.003***	-0.003***
	[2.78]	[3.00]	[2.97]
Meeting fee	-1.62e-7	-2.23e-7	-1.13e-7
	[0.36]	[0.45]	[0.27]
Avg. other directorships for outsiders	-0.001	-0.001	-0.001*
	[1.56]	[1.40]	[1.77]
Avg. other directorships for insiders	-5.16e-5	-1.597e-4	-6.87e-6
	[0.15]	[0.50]	[0.02]
Ln (Assets)	-0.004***	-0.003***	-0.004***
	[3.63]	[2.92]	[3.60]
Capital ratio	0.015	0.01	0.014
	[0.60]	[0.38]	[0.54]
Volatility	-0.060***	-0.056***	-0.058***
	[4.80]	[4.90]	[4.58]
Number Tier 1 subsidiaries	1.06e-5	1.33e-5	1.17e-5
	[0.53]	[0.71]	[0.56]
R-squared	0.508	0.523	0.514

Figure 1: Plot of Average Board Size and Fraction Non-insiders 1965-1999

Tables 1 and 2 describe the sample firms. From 1982-1999 all sample firms are BHCs. Prior to 1982, the sample firms consist of a mixture of BHCs and banks. We determine the predecessor banks to the BHCs in our primary data set from Moody's Bank and Finance Manuals. Data prior to 1986 is from Moody's Bank and Finance Manuals. Data post-1986 is from bank proxy statements. The average is taken over the number of institutions in a given year. In 1965, there were 34 institutions; during 1966-1996 there were 35 institutions. In 1997, 1998 and 1999, there were 34, 33 and 32 institutions, respectively. A non-insider is defined to be any director who is not currently an officer of the top layer of the organizational hierarchy of the banking firm. The number of non-insiders may not necessarily be comparable across banks and BHCs, since it is not always possible to identify officers of the BHC whose primary position is with a subsidiary of the BHC from Moody's Bank and Finance Manuals. In contrast, it may be easier to identify all officers of a bank who sit on the board of the bank. Thus, banks may appear to have more insiders than BHCs. The vertical line indicates the start year (1986) of our primary sample.

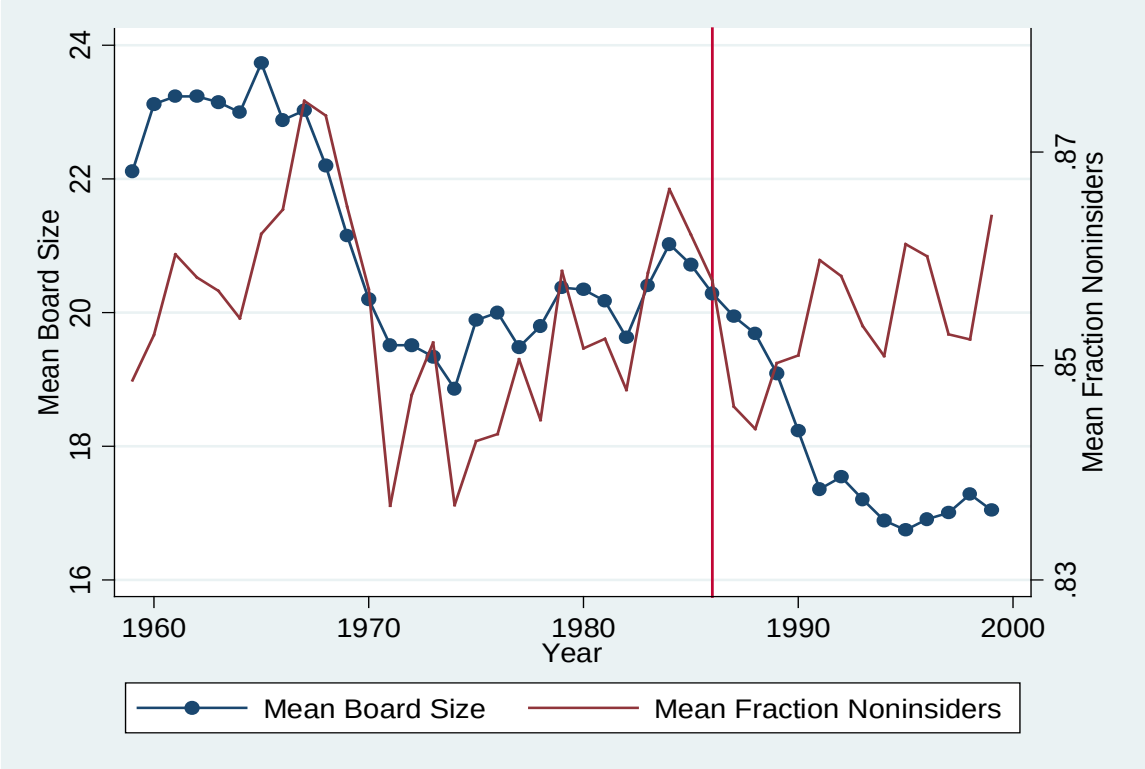

Table 1
Summary Statistics on BHC Characteristics and Governance Variables 1986-1999

Table 1 shows summary statistics for select BHC characteristics and governance characteristics for our sample of 35 BHCs from 1986-1999. All financial variables were collected from the fourth quarter *Consolidated Financial Statements for Bank Holding Companies* (Form FR Y-9C) from the Federal Reserve Board, except monthly stock returns which were collected from CRSP and organizational structure data which is from the Federal Reserve's National Income Center (NIC). Sample data is not available for all firms for all years because of missing data (primarily due to missing proxy statements) and because of acquisitions of sample banks in 1997-1999. Our measure of Q is the ratio of the firm's market value to book value of its assets. The firm's market value is calculated as book value of assets minus book value of equity plus market value of equity. Return on assets (ROA) is calculated as the ratio of net income to book value of assets. We calculate a measure of bank capital, its primary capital ratio, which we define as the sum of the book value of common stock, perpetual preferred stock, surplus, undivided profits, capital reserves, mandatory convertible debt, loan and lease loss reserves, and minority interests in consolidated subsidiaries minus intangible assets. Volatility of stock price is measured as the standard deviation of the monthly returns on the stock price for the given year. Number Tier 1 subsidiaries is the number of subsidiaries that are directly controlled by the parent BHC. Number of states is the number of states that domestic Tier 1 subsidiary headquarters are located in. Data on all governance characteristics for a given fiscal year is collected from the current and the previous fiscal year's proxy statements. We consider a director to be an insider if he works for the firm and affiliated if he has had any previous business relationship with the firm or family relationship with its officers. All other directors are outsiders. The proportional change in board size and composition is calculated as the change from the previous year divided by the amount in the current year. We classify boards as being interlocked if any inside director sits on the board of an affiliated or outside director. Meeting fees is the amount directors get paid to attend board meetings. Number of M&A with additions is the number of M&A transactions which involved additions to the board for each firm during 1986-1999. Number M&A directors in a given year is the sum of all directors on the board in that year who joined the board as the result of an M&A transaction. Ratio of M&A directors to board size is the fraction of directors who joined the board as the result of an M&A transaction. Overlap with lead bank board is the fraction of parent BHC directors who also sit on the board of the BHC's lead bank. Directors sit on subsidiary boards is a dummy variable equal to 1 if any BHC director sits on the board of a subsidiary bank in a given year. Number lead bank directorships is the number of parent BHC directors sitting on the board of the lead bank. Number M&A directors with lead bank directorships is the number of parent BHC directors who joined the board as a result of an M&A transaction who also sit on the board of the lead bank.

	Obs.	Mean	Std. Dev.	Min	Max
Financial Variables					
Tobin's Q	480	1.05	0.08	0.95	1.55
Return on assets	480	0.01	0.01	-0.03	0.02
Total assets (in millions of $)	480	40900	59200	3007	633000
Capital ratio	480	0.08	0.02	0.03	0.15
Volatility	484	0.08	0.03	0.01	0.22
Complexity Measures					
Total deposits (in millions)	478	25069.33	32028.63	2416.96	357260
Number Tier 1 subsidiaries	478	18.23	13.25	1	75
Number of states	478	4.57	3.09	1	18
Subordinated debt/Assets	478	0.013	0.01	0	0.05
Board Size and Composition					
Board size	472	17.97	5.33	8	36
Fraction of outside directors	472	0.69	0.15	0.10	0.95
Fraction of non-inside directors	472	0.80	0.08	0.44	0.95
Changes in Board Size and Composition					
Number of years board size changes	35	9.97	2.07	5	14
Number of years fraction outside directors changes	35	10.37	1.37	8	13
Number of years fraction non-insiders changes	35	9.91	1.81	5	13
Changes in board size	349	-0.33	3.20	-18	14
Changes in fraction of outside directors	363	1.36e-3	0.08	-0.37	0.30

Changes in fraction of non-insiders	347	3.82e-4	0.06	-0.19	0.18
Proportional changes in board size in %	349	-3.02	18.34	-133.33	53.85
Proportional changes in fraction outside directors in %	363	-1.48	19.49	-223.08	46.15
Proportional changes in fraction of non-insiders in %	347	-0.20	7.40	-39.29	21.43
Other Governance Characteristics					
Number of committees	472	4.42	1.64	1	9
Committee size / Number committees	446	1.87	0.92	0.14	5
% committees chaired by outsiders	472	62.43	30.23	0	100
Average number of committees per chair	446	2.03	0.83	1	5.33
Meetings per year	472	8.48	3.30	2	24
Meeting fee	471	994	617	0	9000
Average other directorship for outsiders	472	1.76	0.88	0	5.29
Average other directorship for insiders	471	1.49	1.31	0	7
Dummy if board interlock exists	482	0.39	0.49	0	1
% CEO ownership	463	2.27	6.83	0	49.44
Dummy if pay directors deferred comp.	482	0.95	0.23	0	1
Dummy if pay directors deferred stock	482	0.31	0.46	0	1
M&A Transaction Data and M&A-related Board Composition					
Number of M&A with additions	35	2.03	1.79	0	6
Number of directors added in M&A transaction	71	3.61	3.03	1	14
Fraction of acquirer's board added in M&A transaction	70	0.17	0.14	0.03	0.56
Number M&A directors	482	2.52	3.58	0	16
Number non-M&A directors	472	15.45	5.09	4	36
Ratio of M&A directors to board size	472	0.13	0.18	0	0.68
Subsidiary Directorships					
Overlap with lead bank board	476	0.51	0.42	0	1
Directors sit on subsidiary boards	482	0.84	0.37	0	1
Number lead bank directorships	482	7.80	7.40	0	29
Number directors w/o lead bank directorships	482	7.99	8.27	0	31
Number lead bank directorships held by non-insiders	482	5.98	6.637	0	25
Number M&A directors with lead bank directorships	482	0.42	1.28	0	8
Number M&A directors w/o lead bank directorships	482	2.10	3.42	0	16

Table 2
Summary Statistics for Banking Firms 1965-1985

Table 2 shows summary statistics for select financial variables, board size and composition of the predecessors of the BHCs in our 1986-1999 data over the period of 1965-1985. 1965 is the first year we can obtain stock price data in CRSP for at least one of our sample BHCs. From 1982-1999, all sample firms are BHCs. Prior to 1982, the sample firms consist of a mixture of BHCs and banks. We determine the predecessor banks to the BHCs in our primary data set from Moody's Bank and Finance Manuals. Balance sheet data for BHCs was collected from the fourth quarter *Consolidated Financial Statements for Bank Holding Companies* (Form FR Y-9C) from the Federal Reserve Board. Balance sheet data for banks was collected from *Reports of Condition and Income (Call Reports)*. Monthly stock returns are from CRSP. Our measure of Tobin's Q is the ratio of the firm's market value to book value of its assets. Our proxy for market value is the book value of assets minus the book value of equity plus the market value of equity. Return on assets (ROA) is calculated as the ratio of net income to book value of assets. Capital/assets=Book value equity/Book value assets. Volatility of stock price is measured as the standard deviation of the monthly returns on the stock price for the given year. Data on board characteristics is from Moody's Bank and Finance Manuals. A non-insider is defined to be any director who is not currently an officer of the banking firm's headquarters.

	Observations	Mean	Std. Deviation	Minimum	Maximum
Financial Variables					
Tobin's Q	473	1.00	0.03	0.94	1.14
Return on assets	473	0.01	2.7e-3	3.98e-4	0.02
Total assets (in millions of $)	473	9030	13900	707	87700
Capital/assets	473	0.06	0.01	0.03	0.11
Volatility	459	0.07	0.03	0.02	0.18
Board Size and Composition					
Board size	473	20.35	5.77	5	43
Fraction of non-insiders	473	0.85	0.07	0.40	0.97

Table 3
Fixed Effect Regressions of Tobin's Q on Board Structure plus Controls

Table 3 shows fixed effect regressions of Tobin's Q on the natural logarithm of board size, the fraction of outside directors and financial and governance controls using the sample of BHCs from 1986-1999. Tobin's Q=(book value of assets+market value of equity-book value of equity)/book value of assets. We consider a director to be an insider if he works for the firm and affiliated if he has had any previous business relationship with the firm or family relationship with its officers. All other directors are outsiders. The specification in columns II and VII use board size instead of the natural logarithm of board size. Specification VIII uses a spline regression based on the terciles 8-15, 16-20 and 21-36 of board size. Board size between 8 and 15 is defined to be board size if board size is between 8 and 15 and 15 otherwise. Board size between 16 and 20 is defined to be 0 if board size is between 8 and 15, board size for board size between 16 and 20 and 20-15 otherwise. Board size between 21 and 36 is defined to be board size -20 if board size is between 21 and 36 and 0 otherwise. Table 1 describes the sample and the control variables further. Columns vary by the regressors they include. All specifications include year dummies and firm fixed-effects. The coefficient on the constant term is omitted for the sake of brevity. Absolute values of robust t-statistics are in brackets. Significance levels: (***)-1% (**)-5% (*)-10%.

(continued on next page)

	Dependent Variable: Tobin's Q							
	I	II	III	IV	V	VI	VII	VIII
Ln (Board size)	0.018*		0.021**	0.019*	0.01	0.017*		
	[1.82]		[2.16]	[1.88]	[0.97]	[1.67]		
Board size		0.001*					0.001**	
		[1.94]					[2.01]	
Board size between 8 and 15								0.002
								[0.71]
Board size between 16 and 20								9.36e-5
								[0.07]
Board size between 21 and 36								0.001*
								[1.95]
Fraction of outside directors	0.025	0.026	2.24e-4	0.01	9.6e-5		0.011	0.011
	[1.12]	[1.16]	[0.01]	[0.45]	[0.00]		[0.53]	[0.53]
Fraction of non-insiders						0.041		
						[1.48]		
Ln (Number committees)			-0.039***	-0.042***	-0.031**	-0.043***	-0.041***	-0.041***
			[2.94]	[3.20]	[2.59]	[3.23]	[3.16]	[3.08]
Committee size / Number committees			0.009	0.011	-0.002	0.01	0.011	0.011
			[1.21]	[1.29]	[0.23]	[1.29]	[1.30]	[1.36]
% Outside chair			3.83e-5	-6.63e-6	1.31e-5	5.69e-6	-1.97e-5	-2.8e-5
			[0.31]	[0.05]	[0.11]	[0.05]	[0.16]	[0.22]
Avg. number committees per chair			-0.001	-0.001	0.009	-0.001	-0.001	-0.001
			[0.12]	[0.12]	[1.22]	[0.12]	[0.15]	[0.19]
Ln (Number board meetings)				-0.007	-0.005	-0.01	-0.007	-0.006
				[0.82]	[0.61]	[1.07]	[0.77]	[0.69]
Meeting fee				1.06e-5**	1.0e-5**	9.61e-6**	1.03e-5**	1.01e-5**
				[2.56]	[2.37]	[2.37]	[2.50]	[2.43]
Avg. other directorships for outsiders				-0.007*	-0.006	-0.006*	-0.007*	-0.006*
				[1.71]	[1.58]	[1.67]	[1.76]	[1.73]
Avg. other directorships for insiders				-0.007***	-0.006***	-0.008***	-0.007***	-0.007***
				[3.47]	[2.96]	[3.72]	[3.54]	[3.56]
Dummy if board interlock exists					-0.011**			
					[2.50]			
% CEO ownership					-0.008***			
					[3.46]			
Dummy if pay directors deferred stock					-0.016***			
					[2.74]			
Dummy if pay directors deferred comp.					-1.74e-4			
					[0.02]			
Ln (Assets)	0.001	0.002	-0.007	-0.007	-0.009	-0.007	-0.007	-0.006
	[0.17]	[0.19]	[1.05]	[1.05]	[1.42]	[1.08]	[1.00]	[0.94]
Capital ratio	0.545**	0.554**	0.713**	0.736**	0.922***	0.736**	0.747**	0.755**
	[2.17]	[2.20]	[2.33]	[2.42]	[2.98]	[2.42]	[2.45]	[2.42]
Volatility	-0.008	-0.007	-0.067	-0.067	-0.109	-0.068	-0.067	-0.066
	[0.08]	[0.07]	[0.80]	[0.80]	[1.31]	[0.83]	[0.80]	[0.79]
Lagged ROA	1.707***	1.700***	1.497***	1.416***	1.689***	1.438***	1.415***	1.429***
	[3.58]	[3.56]	[3.13]	[2.91]	[3.58]	[2.92]	[2.90]	[2.90]
Observations	472	472	446	444	436	444	444	444
R-squared	0.799	0.776	0.788	0.799	0.813	0.8	0.799	0.799

Table 4
Fixed Effect Regressions of Tobin's Q on M&A Board Additions plus Controls

Table 4 replicates the fixed effect Tobin's Q regressions in column IV of Table 3 after including controls for M&A board additions. Tobin's Q=(book value of assets+market value of equity-book value of equity)/book value of assets. Addition to Board following M&A is a dummy which is equal to 1 if an M&A transaction occurred in a given year in which directors from the target were added to the BHC board. Potential M&A additions is a dummy which is equal to 1 if 3 or more directors were added to the board in a given year, but the proxy did not indicate whether this was due to an M&A transaction. Table 1 describes the sample and the control variables further. All regressions control for the set of controls Ln (Number committees)-Lagged ROA included in the specification in column IV of Table 3; however, these coefficients are not reported for the sake of brevity. All specifications include year dummies and firm fixed-effects. The number of observations is 444 in all columns. Absolute values of robust t-statistics are in parentheses. Significance levels: (***)-1% (**)-5% (*)-10%.

	Dependent Variable: Tobin's Q			
	I	II	III	IV
Ln (Board size)	0.019*	0.024**		
	[1.77]	[2.12]		
Addition to Board following M&A	0.002	0.001		
	[0.56]	[0.16]		
Potential M&A additions		-0.011*		
		[1.69]		
Number non-M&A directors			0.001**	0.001*
			[1.99]	[1.78]
Number M&A directors			0.001	0.001
			[1.17]	[1.14]
Fraction of outside directors	0.01	0.011	0.012	
	[0.47]	[0.52]	[0.53]	
Fraction of non-insiders				0.044
				[1.52]
Constant	1.092***	1.085***	1.117***	1.108***
	[9.05]	[9.02]	[8.40]	[8.32]
Additional controls	As in column IV, Table 3			
R-squared	0.799	0.8	0.799	0.8

Table 5
Fixed Effect Regressions of Tobin's Q on Board Structure using data from 1965-1999

Table 5 compares fixed effect regressions of Tobin's Q on the natural logarithm of board size, the proportion of non-inside directors and financial controls using the full sample of data from 1965-1999 (columns I and II) to the same regressions restricted to data prior to 1986 (columns III and IV). Columns V and VI examine whether the effect of board size is changing over time. Tobin's Q=(book value of assets+market value of equity-book value of equity)/book value of assets. Data on board size and composition prior to 1986 is from Moody's Bank and Finance Manuals. Data on board size and composition post-1986 is from bank proxy statements. A non-insider is defined to be any director who is not currently an officer of the banking firm's headquarters. Tables 1 and 2 describe the sample and the control variables further. All specifications include year dummies for all years beginning in 1973 and firm fixed-effects. Absolute values of robust t-statistics are in parentheses. Significance levels: (***)-1% (**)-5% (*)-10%.

	Dependent Variable: Tobin's Q					
	I	II	III	IV	V	VI
Ln (Board size)	0.012**	0.011**	0.017***	0.018**	3.639**	3.564**
	[2.39]	[1.98]	[2.69]	[2.38]	[2.48]	[2.35]
Fraction of non-insiders		0.015		-0.003		0.015
		[0.83]		[0.17]		[0.58]
Ln (Board size)*Year					-0.002**	-0.002**
					[2.48]	[2.35]
Year					0.007***	0.007***
					[3.33]	[3.15]
Ln (Assets)	-0.001	-0.001	-0.009	-0.009	0.014***	0.014***
	[0.26]	[0.23]	[1.59]	[1.56]	[2.83]	[2.84]
Volatility	0.064	0.065	0.03	0.03	0.151**	0.151**
	[1.03]	[1.04]	[0.84]	[0.85]	[2.07]	[2.07]
Capital ratio	-0.226	-0.229	-0.761***	-0.757***	0.659***	0.656***
	[1.50]	[1.52]	[3.78]	[3.69]	[4.26]	[4.24]
Lagged ROA	2.546***	2.560***	3.929***	3.927***	3.631***	3.642***
	[5.23]	[5.24]	[6.06]	[6.06]	[6.28]	[6.27]
Constant	1.000***	0.990***	1.125***	1.127***	-13.587***	-13.337***
	[15.63]	[14.95]	[13.75]	[13.31]	[3.19]	[3.01]
Sample years	1965-1999	1965-1999	1965-1985	1965-1985	1965-1999	1965-1999
Observations	930	929	458	458	930	929
R-squared	0.746	0.746	0.638	0.638	0.537	0.537

Table 6
The value of subsidiary directorships

Table 6 examines whether additions to boards of directors with subsidiary directorships add more value as complexity increases. Tobin's Q=(book value of assets+market value of equity-book value of equity)/book value of assets. Table 1 describes the variables in more detail. All regressions control for the additional controls in column IV of Table 3 (Ln (Number committees)-Lagged ROA) that are not reported here for the sake of brevity. All specifications include year dummies and firm fixed-effects. # M&A w. lead bank directorsh.* # T 1 subs. is the abbreviation for Num. M&A w. lead bank directorships* Num. Tier 1 subs. The coefficient on the constant term is omitted for the sake of brevity. Absolute values of robust t-statistics are in parentheses. Significance levels: (***)-1% (**)-5% (*)-10%.

	Dependent Variable: Tobin's Q						
	I	II	III	IV	V	VI	VII
Number directors w/o lead bank directorships	-0.001	-4.634e-4	-4.952e-4	-4.89e-4	-3.06e-4		
	[1.33]	[1.13]	[1.20]	[1.23]	[0.74]		
Number lead bank directorships	-0.001	-0.018***	-1.672e-4	-0.002**	-2.703e-4		
	[0.98]	[2.67]	[0.28]	[2.49]	[0.56]		
Num. lead bank dirs. * Num. Tier 1 subs.	1.11e-4**						
	[2.53]						
Num. lead bank dirs.* Ln (Assets)		0.001***					
		[2.74]					
Num. lead bank dirs.* Total deposits			5.28e-11**				
			[2.49]				
Num. lead bank dirs.* Number of states				0.001***			
				[3.27]			
Num. lead bank dirs.* Sub. debt/Assets					0.071**		
					[2.44]		
Ln (Number lead bank directorships)						0.008*	
						[1.96]	
Number non-M&A directors							0.001*
							[1.73]
Num. M&A directors w. lead bank directorsh.							-0.005
							[1.20]
Num. M&A dirs w/o lead bank directorsh.							0.001
							[0.65]
# M&A w. lead bank directorsh.* # T 1 subs.							4.33e-4**
							[2.11]
Fraction of outside directors	0.01	0.009	0.014	0.004	0.014	0.023	0.005
	[0.46]	[0.40]	[0.66]	[0.17]	[0.66]	[0.81]	[0.24]
Number Tier 1 subsidiaries	-2.801e-4	7.61e-6	2.2e-5	-3.414e-4	-1.988e-4	1.863e-4	-2.536e-4
	[1.38]	[0.04]	[0.10]	[1.21]	[0.99]	[0.55]	[1.14]
Total deposits			-1.17e-10				
			[1.49]				
Number of states				0.001			
				[1.11]			
Subordinated debt/Assets					0.081		
					[0.25]		
Additional controls	As in column IV, Table 3						
Observations	442	442	442	442	442	359	442
R-squared	0.805	0.804	0.803	0.811	0.807	0.791	0.8