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ABSTRACT

We develop a theory of bank board risk committees. With this theory, such committees are valuable even though there is no expectation that bank risk is lower if the bank has a well-functioning risk committee. As predicted by our theory (1) many large and complex banks voluntarily chose to have a risk committee before the Dodd-Frank Act forced bank holding companies with assets in excess of $10 billion to have a board risk committee, and (2) establishing a board risk committee does not reduce a bank's risk on average. Using unique interview data, we show that the work of risk committees is consistent with our theory in part.

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1. Introduction

There is an extremely large literature in financial economics on corporate boards. Surprisingly, this literature does not have much to say about how boards should be organized (Adams, Ragunathan, and Tumarkin 2020). Instead, it is mostly focused on how the board is selected, who should be on the board, who should chair the board, and on the size of the board (e.g., Adams 2017; Carcello, Hermanson, and Ye 2011; Banerjee, Nordqvist, and Hellerstedt 2020; Khatib, Abdullah, and Elamer 2020). In this study, we attempt to make progress toward our understanding of how boards are organized by addressing the question of when a bank board benefits from having a risk committee and what the implications are for a bank's risk-taking when it has a board risk committee.

Though the Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA) passed in July 2010 required bank holding companies with more than $10 billion of assets to have a board risk committee, a majority of the banks required to have a risk committee had one before the legislation.[1] The presumption of the legislators apparently was that having a board risk committee would reduce bank risk-taking. As far as we know, there was no scientific evidence at the time suggesting that requiring the establishment of a risk committee for banks that did not have one would be valuable either for the banks' owners or for the financial system. We develop a model of whether a bank should have a risk committee and show that for a bank that maximizes shareholder wealth there is no expectation that a board risk committee causes bank risk-taking to decrease. Our empirical analysis fails to uncover evidence that the existence of a board risk committee decreases bank risk-taking. We use unique interview data to assess how bank risk committees work and whether they act as expected with our theory. We find that risk committees play a role that is consistent with our theory except that they also seem to be a way for regulators to monitor and influence risk-taking within banks. Though a well-functioning risk committee can be valuable to a bank's shareholders, it is also possible for the risk committee to worsen the communication and engagement of a bank's board.

[1] The Economic Growth, Regulatory Relief, and Consumer Protection Act of 2018 increased the asset threshold to $50 billion (https://www.congress.gov/bill/115th-congress/senate-bill/2155).

Taking risks is a core activity for banks. Therefore, we would expect the board to pay close attention to how a bank takes risks and to the risks that a bank is exposed to. For the board to make useful decisions concerning the bank's risk-taking, it is necessary for the risk metrics it monitors to be reliable. While the audit committee makes sure that the accounting metrics are reliable, the accounting metrics are not sufficient to assess risk-taking for more complex banks. If a bank mostly makes loans, whether the bank makes the type of loans that help increase shareholder wealth can be assessed using typical metrics that do not require specialized knowledge. However, as the activities of a bank become more complex, monitoring the risk and risk-taking of a bank requires non-accounting risk metrics. Assessing the reliability of these metrics and assessing the bank management's adherence to board risk-taking targets becomes a more difficult and more time-consuming exercise. When this exercise becomes sufficiently complex and time-consuming, it makes sense to have most of it conducted outside of a board meeting by members of the board who have specialized knowledge. As such, we would expect larger banks and banks with more complex activities to be more likely to have a risk committee. We find that this was the case before the DFA was enacted.

Risk metrics differ from accounting metrics in important ways that make the work of a risk committee different from the work of an audit committee. Risk metrics are typically forecasts. Though some accounting metrics involve forecasts, most do not. Further, risk metrics are forecasts of higher statistical moments rather than forecasts of expected values. For instance, when it comes to stock positions, risk metrics are typically not forecasts of expected returns but forecasts of volatility or other statistics. Therefore, an obvious concern is whether a firm's risk metrics capture risks that may affect outcomes for the firm materially in a reasonable way.

For any bank, there is an optimal amount of risk-taking that maximizes shareholder wealth. A board focused on maximizing shareholder wealth would want to make sure that the bank takes the right amount of risk – neither more nor less – that is optimal for shareholders subject to the constraints imposed by regulators (Stulz 2016). A board focus on shareholder wealth maximization that believes that it will be more effective in making sure that the bank takes the right amount of risk by having a risk committee would

choose to have one. If banks that would have benefitted from having a risk committee chose to have one before the DFA, there is no reason to expect that forcing banks that did not have a risk committee to create one would improve the functioning of the board or make it more likely that the bank would take the right amount of risk. There is no presumption that having a risk committee would result in a bank taking less risk. However, there is a presumption that if a bank would benefit from having a risk committee, its board with a risk committee would make better risk-taking decisions than without one.

The DFA requirement was not put in place to enable banks to better maximize shareholder wealth. Instead, there was a view that banks were taking too much risk and that a board risk committee would act to reduce or control risk-taking. A risk committee could perform such a role under two very distinct scenarios. First, it could be that management on its own would take too much risk compared to what shareholders would want. In this case, if, with a risk committee, the board becomes more effective at monitoring risk-taking, the bank would end up with less risk. Second, shareholders might want the bank to take too much risk compared to what the regulators would want. In this case, regulators might be able to influence the risk committee to act to mitigate shareholders' risk-taking. In this case again, having a risk committee would reduce risk-taking.

We examine whether the performance and risk during the global financial crisis (GFC) of banks vary with the existence of a risk committee in 2006 and whether the performance and the risk of a bank changes after the addition of a risk committee during 2003-2018. We focus on banks that would have had a risk committee had the DFA requirement been in force throughout our sample period. We find no evidence that banks with a risk committee perform better or have less risk. As discussed, this lack of evidence does not mean that having a risk committee when appropriate does not increase shareholder wealth. It could be consistent with a notion that the risk committee at times has the impact of reducing risk-taking and at other times has the opposite impact. As a result, risk-taking would more likely be at the level that maximizes shareholder wealth. However, the evidence is inconsistent with the view that banks take too much risk without a risk committee and the committee reduces risk-taking.

Boards have a monitoring role and an advisory role. They help the CEO, but they also watch over the CEO. One of the most important decisions that a board may have to make is to replace the CEO. A risk committee can also have a monitoring role and an advisory role. Management's incentives with respect to risk-taking and risk-control may differ from the incentives of shareholders. In particular, management might be too conservative because it derives benefits from its position that it could not replicate if it lost its position. Alternatively, management might want to take more risks or save on risk monitoring expenses to have better short-run performance. In such cases, the CEO might be reluctant to have more risk monitoring. In general, entrenched CEOs might object to more board monitoring, so that they would want to avoid having a board with a competent risk committee. CEOs who are not entrenched and lead banks with more complex risk positions might value advice from a risk committee. However, a potential complication with the risk committee after the DFA is that it has a relationship with regulators that could potentially circumvent the CEO. Such a situation might work to make the risk committee less effective as an advisor and more focused on monitoring.

Finding no evidence that risk is lower when a bank has a risk committee is consistent with our model where the board is focused on maximizing shareholder wealth and uses the risk committee to help it be more effective. In such a situation, the risk committee improves the board's monitoring of the bank's risk and risk-taking and provides management with advice. With the alternative theories, the risk committee would more directly attempt to reduce the bank's risk either because management wants to take too much risk or because regulators want the committee to do so. It is not possible to investigate directly which functions a risk committee performs using traditional datasets. To assess more directly the role that risk committees play, we use a unique dataset, which comprises in-depth interviews with 20 chairs of risk committees in financial institutions. This dataset allows us to understand how these committees perceive their role and how they proceed in trying to fulfill that role.

The financial institutions represented in our panel differ considerably in size. It is clear from the interviews that the workload increases with bank size. The issues that a risk committee at a large institution has to deal with are such that they could not possibly receive the same attention if they were addressed only

at a plenary board meeting. It is also quite clear from the interviews that chairs of risk committees believe that it is important for them to have direct access to the leadership of the risk management team and to develop a good working relationship with that team. A concern with the role of risk committees in the DFA is that they could be a way for bank examiners and regulators to push their agenda. We find that regulatory matters are time-consuming for risk committees and impact committees' agenda considerably. Further, in many cases, the risk committee chair interacts directly with bank supervisors and regulators. It seems clear that bank examiners and regulators influence risk committees' work. Though having a committee chair that engages with the risk management leadership team and with bank supervisors on his/her own and without the presence of the CEO would seem to be a possible source of tensions, our interviews do not show that such tensions are important.

Our paper contributes to several literatures. First, we contribute to the governance literature in general and the governance literature for banks. As mentioned, the governance literature has little to say about the optimal arrangements of boards when it comes to committees. Existing studies on the role of board committees find that the establishment of committees within a board can have adverse effects on the functioning of the board and on the performance of the firm. In the most comprehensive study of board organization, Adams et al. (2020) conclude that giving formal authority to board committees can impair communication and decision-making for the board. In an earlier study, Faleye, Hoitash, and Hoitash (2011) find that boards that monitor intensively by having more independent directors on monitoring committees make worse acquisitions and innovate less. However, even though there is a large literature on bank governance (see de Haan and Vlahu 2016 for a recent review), the existing literature does not establish when a bank board benefits from having a risk committee and when it does not. It also does not draw theoretical predictions about the impact of having a bank board risk committee on a bank's risk-taking. Our study intends to fill in this gap. Second, we contribute to the literature addressing the role of bank supervisors and regulators. Recent evidence shows that banks subjected to more supervisory attention take less risk (Hirtle, Kovner, and Plosser, 2020). Our evidence shows that interactions with the risk committee chair and the risk committee can be one way for the supervisors to monitor and affect a bank's risk-taking.

Third, we add to the literature evaluating post-crisis reforms. Lastly, and perhaps most importantly, we add to our understanding of bank risk management and of the role of the board in bank risk management. This literature includes studies that examine the impact of risk committees on risk-taking and performance of banks during the crisis. We will discuss how the findings from these studies relate to the findings of this study when we discuss the results.

The paper proceeds as follows. In Section 2, we present our theory of bank board risk committees and develop testable hypotheses. In Section 3, we investigate which firms have risk committees before the DFA. In Section 4, we investigate how bank performance and risk metrics are related to the presence of a risk committee. In Section 5, we introduce our interview data and use it to investigate whether the functions performed by risk committees correspond to our theoretical predictions. We conclude in Section 6.

Section 2. Why do banks have a risk committee when not forced to have one?

In this section, we first present our risk committee theory for a bank where the board maximizes shareholder wealth subject to constraints from laws and regulations. In such a bank, absent regulatory constraints, the bank will have a board risk committee if having one makes shareholders better off. We call this the shareholder wealth maximization theory of board risk committee choice, or just the shareholder wealth maximization hypothesis. We then turn to the case where a bank's shareholders would benefit from the board having a risk committee but the bank board does not have one. We refer to this situation as the entrenchment hypothesis.

Section 2.a. When does a risk committee increase shareholder wealth?

Why do boards have committees? A study that examines an extremely large sample of public firms from 1996 to 2010 finds that boards have an average number of committees that is between three and four every year (Adams et al. 2020). Because of regulatory mandates (e.g., SOX 2002, SEC 2003b), it is standard for boards of public firms to have an audit committee, a compensation committee, and a corporate governance and nominating committee. Sometimes boards of public firms have additional committees, but

if they do, they have few of them. For instance, the board of directors of Microsoft has four committees: Audit, Compensation, Governance and Nominating, and Regulatory and Public Policy. Microsoft's board does not have a committee focused on its cloud operations or on Windows, despite the fact that the profits generated from these activities are worth hundreds of billions of market capitalization. Similarly, JPMorgan Chase's board has committees that are similar to those of Microsoft, except that it also has a risk committee. JPMorgan Chase does not have a committee for its Asset Management division or its Customer Finance division.

There are at least four reasons why firms do not have more standing committees and why they do not have standing committees that are charged with responsibilities concerning operating divisions. First, firms are run by the chief executive officer. The role of the board is not to second-guess the day-to-day operating decisions of the chief executive officer. If Microsoft's board had a committee charged with following the development of Microsoft's cloud activities, it would be very difficult for such a committee not to interfere with what management is doing. As a result, the committee might make it more difficult for the firm to pursue its strategy rather than support management in its efforts to make the firm successful. Second, board members have fiduciary duties. They have a duty of care. Such a duty means that they have to be knowledgeable about decisions the board has to make and cannot delegate those decisions. It would make no sense for a committee to debate an issue and then have the same issue debated again to the same extent at a board meeting. It follows that the types of issues that can be handled through a committee are necessarily limited. Third, the time of board members is limited. Having board members devote attention to a specific issue means that they cannot devote attention to other issues. Further, increasing the time that directors spend on board issues makes it more difficult to have a board with the diversity of skills and experience that maximizes board effectiveness as it increases the cost of board membership. Fourth, as discussed by Adams, Ragnunathan, and Tumarkin (2020), committees can reduce the engagement of board members and can make communication among board members more difficult. As emphasized by Malenko (2014), effective communication among board members is critical for a board to perform its functions well. Committee members may constitute a subset of board members that end up forming a clique within the

board, leading to less communication at board meetings and block voting. Committee members could even withhold information from the whole board strategically to increase the power of the committee. However, if members of a committee all share expertise, they may be more effective monitors.

The audit committee is "charge[d] with overseeing the company's financial reporting processes and internal control over financial reporting (ICOFR) and the audits of the company's financial statements."[2] The board cannot fulfill its responsibilities if it cannot rely on the firm's financial statements. For instance, if the financial statements were biased, the board would be less able to assess CEO performance. However, this is an area where the board can delegate much of the work that is required to ensure that the process that produces the financial statements leads to financial statements that are reliable. The audit committee can explore many technical issues to gain confidence in the financial statements and can report to the board about its efforts. The board does not have to be familiar with technical accounting details. It does not have to negotiate auditor fees as a board. With the audit committee, there is no concern that the committee may inhibit the CEO in managing the firm since the production of reliable financial statements is critical for the board to perform its role and for a CEO focused on shareholder interests to manage the firm.

Accounting produces various metrics used to assess firm performance. These metrics are imperfect and often do not correspond to the relevant economic quantities, but they are well-understood and largely comparable across firms. For many firms, risk metrics are another set of metrics that is essential in evaluating the condition of the firm and in determining whether the CEO is pursuing a commonly agreed-upon strategy. As an example, for a bank, a given earnings performance can have a very different meaning depending on the risks it has taken. For instance, a given level of earnings could be impressive for a bank that takes little risk, but could be worrying for a bank that takes much risk as it could be due to chance outcomes from risk-taking. A board has to assess whether the risk taken by the bank is consistent with the business model of the bank and with its strategy. To be able to make this assessment, the board has to be able to rely on management's representations about risk. Making sure that data and representations about

[2] KPMG (2017); also see SEC (2003b) for details.

risk can be relied on is a task that a board committee can perform. An individual board member does not have to know all the technical details that a committee has to probe to become comfortable with the data and representations about risk. The board member has to be able to use the data and representations about risk to make decisions. She does not have to know about how risk metrics are produced if she can be confident about the reliability of the information.

Every board relies on metrics produced by the firm's accounting process. It is therefore not surprising that boards of public companies have an audit committee to make sure that the metrics the board uses are reliable. Some of the risk metrics that boards rely on are metrics produced by the firm's accounting process. For instance, the accounting process informs the board about the bank's leverage, the composition of its assets, and the performance of its loans. Though not all the information may be publicly disclosed, the accounting process generates information about the loan portfolio and the securities portfolio that can be used by the board. A bank that mostly makes loans to small firms and individuals has data on loan losses and on internal ratings of loans. These metrics can be determined through the auditing process and, therefore, a risk committee is not necessary to ensure their reliability for the board.

The situation is different for a more complex bank. Risk metrics that are forward looking are essential for such a bank to manage its risk and for the board to be able to evaluate whether the bank follows its agreed-upon risk appetite. For instance, a bank that makes markets in derivatives has to use more complex risk metrics to understand the risk arising from such activities. The accounting function does not produce these metrics. To complicate matters, there is no rulebook like GAAP for the production of risk metrics. Further, assessing risk for such a bank also requires evaluating risk along dimensions that are harder to quantify. For instance, the risks of two otherwise identical banks might be quite different if risk limits are monitored differently and compliance with those limits differs. Similarly, the assessment of risk metrics might differ across banks that have different cultures.

It follows from the analysis that, for more complex banks focused on maximizing shareholder wealth, the role of a risk committee is to be the audit committee for risk metrics. It has to ensure that the metrics are produced in a way that the board can rely on them and that these metrics are consistent with the firm's

strategy. It has to make sure that the risk metrics cover all the risks that are material to the bank from the perspective of the board. It has to assess the processes used to produce these metrics and used to ensure that the bank stays within established limits for these metrics. When the relevant metrics are produced as part of the accounting process, we would not expect a risk committee to be in place. In other words, simple banks will not have a risk committee. As a bank becomes larger and more complex, we would expect it to put in place a risk committee to help maximize shareholder wealth.

With both the audit committee and the risk committee, there is no concern about usurping functions of the CEO or management because the board cannot perform its functions if it cannot rely on the metrics that these committees focus on. If deeper probing concerning these metrics is resisted by the CEO, this would be a source of concern for the board since it might raise concerns about the reliability of these metrics. These committees are expected to probe since the CEO may have incentives to hide the truth from the board.

The board of a bank sets a policy with respect to risk-taking. In more recent years, this policy for large banks is captured by risk appetite statements.[3] These statements define the level of risk that the board views as appropriate for the bank. It can set limits to risk-taking such that risks that go beyond these limits are not appropriate. With a more traditional bank, it can be relatively straightforward to make sure that management's risk-taking is within the limits prescribed by the board. However, as the bank becomes more complex and larger, bank-wide metrics can hide risk-taking that could be problematic and inconsistent with the board's view of an appropriate risk appetite for the bank. To assess whether the board has an unbiased and accurate assessment of the risk of a bank, it is therefore necessary for the board or a risk committee to probe deeper to make sure that the risk metrics have the meaning attributed to them.

A bank's risk appetite policy is adopted by its board. Like any policy, the risk appetite policy is subject to interpretation. Though it will often have clear upper bounds for various risk metrics that are not subject to interpretation, many other components of the policy may not be reducible to bounds on quantitative

[3] See, for instance, International Institute of Finance (2011).

metrics. In such situations, the risk committee can have an advisory function for management in assessing whether particular forms of risk-taking are consistent with the risk appetite policy. At times, upper bounds are exceeded. In such situations, the board has to be comfortable with management's plans to bring the risk back in conformity with the risk appetite of the bank. In such a situation, the risk committee may be in a better position than the whole board to assess the details of management's plan as well as to probe why the upper bound of a particular metric was exceeded.

Banks take risks in conducting their business. For instance, they make loans that are risky. For any bank, given its business model, there is a level of risk that maximizes shareholder wealth given the constraints placed by laws and regulations (Stulz 2016). The board plays a key role in setting the target level of risk and in making sure that the bank's risk does not differ too much from that level. Suppose that a bank's board has been operating without a risk committee. Perhaps the functions of the risk committee were performed by the audit committee because the relevant metrics were mostly accounting metrics or by the board as a whole. Now, the bank has become large or its activities have become more complex, so the board concludes that a risk committee is required. In that case, there is no reason that having a risk committee would result in the bank taking less risk. It could be that having more confidence in risk metrics and in the process that produces these metrics, the board would become comfortable with the bank taking more risk.

As an example, suppose the bank has a trading book and it measures the risk of the trading book using value-at-risk (VaR). The board sets limits on VaR for the bank. The bank's true daily VaR is $100 million, but nobody knows the true VaR. The key issue for the board is whether VaR is produced in such a way that the estimate is close to the true VaR. Without a risk committee, the board might think that a VaR estimate of $100 million means that the true VaR is between $75 million and $125 million. However, with a risk committee, it could become confident that the true VaR is between $90 million and $110 million. With that greater confidence, the board might want the limit on VaR to increase and hence have the bank take more risk. In such a situation, the bank's overall risk might increase because of having a risk committee. Over a long period, we would expect the bank's performance to increase. However, if the bank takes more risk, an

adverse outcome from risk-taking could be worse than if it did not take as much risk. As a result, depending on outcomes, ex post the bank could have both higher risk metrics and lower performance having introduced a risk committee.

With the theory presented here, shareholder wealth maximization predicts that a bank with a risk committee should be worth more than the same bank without a risk committee. If it is optimal for a bank to have a risk committee, evidence that an otherwise identical bank without a risk committee has the same or higher value would be inconsistent with our theory based on shareholder wealth maximization. There are at least two problems with testing the bank value implications of a risk committee. First, the contribution to shareholder wealth of having a risk committee may be positive but not large enough to be identified reliably. This is a likely outcome because we would expect the board to be able to address the issues that are the most important for the bank without relying on a risk committee. Second, if banks that should have a risk committee have one and banks that should not have one do not, then differences in value between the banks will not reflect the contribution of the risk committee to shareholder wealth but instead differences between the banks that make it optimal for some to have a risk committee and others not.

Section 2.b. When would a bank whose shareholders would benefit from having a board risk committee not have one?

In Section 2.a., we considered a situation where the board is focused on shareholder wealth maximization and chooses to have a risk committee if doing so makes the board more effective and increases shareholder wealth. With such a situation, forcing a board to have a risk committee if it does not have one would not benefit the board or the shareholders. However, not all boards work that way. It is possible for a board to be beholden to the CEO, and the CEO may not want the board to be more effective or may not want the board to have a committee that monitors the firm's risk and risk-taking. Alternatively, a board may not understand the usefulness of a risk committee or the dependence between bank value and bank risk.

If the board does not pay attention to risk or the CEO pushes back against having a risk committee, it is possible that the bank has more risk than it would if it had a risk committee. In such a situation, having the board create a risk committee would likely lead the board to have a better view of the bank's risk and make decisions to reduce the bank's risk. It follows that adding a risk committee to the board would lead to a reduction in risk if the risk committee is effective and the board listens to its recommendations. It is also possible that the board did not have a risk committee because the CEO wanted more discretion rather than because she wanted to take more risk. For instance, the CEO might have wanted a quiet life, in which case the bank would have taken too little risk and adding a risk committee could lead the bank to take more risk. Both risk scenarios are consistent with an entrenched CEO and a board that pays more attention to the CEO interests than to maximizing shareholder wealth.

If a board risk committee is in the best interest of shareholders but a board chooses not to have one, it implies that the board either does not know what is in the best interest of shareholders or it chooses to not maximize shareholder wealth. There is no good way to investigate whether having a risk committee is optimal for shareholders but the board does not have one because it does not know that it is optimal for shareholders. The entrenchment hypothesis predicts that firms whose board does not have a risk committee but are comparable to firms that do, are firms where the CEO is entrenched and has excessive influence over the board.

Section 3. Empirical determinants of risk committee choice and the Dodd-Frank Act mandate

In this section, we examine whether the banks that chose to have a risk committee before the DFA are the banks we would expect to have such a committee, namely large and complex banks with non-traditional bank risk-taking. We first review the DFA mandate in light of our theory and then provide empirical evidence on the determinants of risk committee choice in 2006.

Section 3.a. The Dodd-Frank Act mandate

The DFA imposes a board risk committee on large publicly traded banks. The restriction of the requirement to publicly traded banks suggests that the motivation for the requirement has to do with corporate governance and that not having such a board committee is a failure of governance that hurts shareholders. Implicitly, the assumed failure of governance leads banks to take on more risk than would be optimal for shareholders and, as a result, leads banks to create potential systemic risk. As discussed in the previous section, such a situation can occur due to management entrenchment, board ignorance, or board ineffectiveness. With such a governance failure, the addition of a risk committee to the board could lead to a situation where banks take less risk. Importantly, adding a risk committee may not change the underlying conditions that enable the firm to have more risk than is optimal for shareholders. For instance, though a risk committee may improve management monitoring, it may fail in doing so when the CEO is well-entrenched. Finding that the addition of a risk committee does not change a bank's risk is not evidence against a risk committee being valuable for shareholders. However, it is evidence against the view that banks without a risk committee are taking too much risk and would take less risk if only they had a risk committee.

If a bank's risk-taking was maximizing shareholder wealth and it did not have a risk committee, requiring that bank to have a risk committee would not change its risk-taking if the risk committee ensures that the risk-taking maximizes shareholder wealth. However, forcing a board to have a risk committee when it believes that it is better off without it creates the possibility that this board will not function as well as it would have had it not been forced to have a risk committee. We would therefore expect that at times that board might make poorer decisions than it would otherwise. Such an impact of the requirement of having a risk committee may take time to develop in that it may take time for that committee to have an adverse impact on the functioning of the board.

The DFA mandate goes further than just requiring some banks to have a risk committee. The mandate is as follows:

§ 252.22 Risk committee requirement for publicly traded bank holding companies with total consolidated assets of $10 billion or more.

(a) Risk committee. A bank holding company with any class of stock that is publicly traded and total consolidated assets of $10 billion or more must maintain a risk committee that approves and periodically reviews the risk-management policies of its global operations and oversees the operation of its global risk-management framework.

(b) Risk-management framework. The bank holding company's global risk-management framework must be commensurate with its structure, risk profile, complexity, activities, and size and must include:

(1) Policies and procedures establishing risk-management governance, risk-management procedures, and risk-control infrastructure for its global operations; and

(2) Processes and systems for implementing and monitoring compliance with such policies and procedures, including:

(i) Processes and systems for identifying and reporting risks and risk-management deficiencies, including regarding emerging risks, and ensuring effective and timely implementation of actions to address emerging risks and risk-management deficiencies for its global operations;

(ii) Processes and systems for establishing managerial and employee responsibility for risk management;

(iii) Processes and systems for ensuring the independence of the risk-management function; and

(iv) Processes and systems to integrate risk management and associated controls with management goals and its compensation structure for its global operations.

The tasks that the risk committee is responsible for under the DFA appear to go beyond having an audit committee for risk. However, the audit committee is also responsible for the processes that lead to the production of financial statements. In that sense, the DFA descriptions of the responsibilities of the risk committee for risk management processes are not fundamentally different from those of the audit committee for financial reporting processes. At the same time, the DFA requirements are quite intrusive in that the Act specifies in detail what kind of processes a bank should have in the area of risk management. For instance, the DFA has a requirement that risk management should be integrated with the compensation structure of the bank globally.

While one might argue that the DFA is only requiring firms to follow good governance practice with respect to risk management, it is a “one size fits all” solution. As a result, it may have requirements that are

not appropriate for some types of banks. The downside of the "one size fits all" DFA solution is that it imposes costs on those banks that would not have chosen to meet these specific requirements on their own because meeting these requirements would not have been economically worthwhile. The most obvious example would be the case of a smaller bank for which some of the processes required by the DFA might not be economically worthwhile because of the nature of the risks that the bank is exposed to.

Section 3.b. Banks with and without a risk committee over time

In this section and the next, we use a sample constructed as follows. We first collect data on all financial firms from 2003 to 2018. We start with all firms in the Financial Services format of Standard and Poor's Compustat and supplement these firms with firms that file the FR Y-9C. We keep all financial institutions in SIC codes 6020, 6021, 6030, 6035, 6036, and 6710 (Commercial Banks, Savings Institutions, and Offices of Bank Holding Companies). The DFA risk committee requirements apply to public Bank Holding Companies (BHC) with assets above $10 billion. Though the Economic Growth, Regulatory Relief, and Consumer Protection Act of 2018 raised the threshold to $50 billion, the change does not affect the results in this study. The BHCs are regulated by the Federal Reserve. The Office of Comptroller of the Currency requires commercial banks with assets over $50 billion that are not BHCs to meet the requirements of the DFA and may require banks with assets as low as $10 billion to also meet the requirements.

We then merge the firms with Compustat to get the financial information for each financial institution. For the BHCs we use the data from the FR Y-9C report filed quarterly by all BHCs, and data for all non-BHC banks is from the Compustat Financials database. This sample is merged with CRSP daily files for stock return information. We then merge this sample with risk committee information from BoardEx. We supplement the BoardEx data with DEF 14A filings data using SeekEdgar.[4] Though BoardEx data begins in 2000, it has much less coverage until 2003. Some of our analyses use a sample that begins in 2003.

[4] To assess whether a financial institution has a board risk committee, we first use BoardEx to identify all risk committees by searching for committees with the word "risk" in the title. BoardEx Data is supplemented by searching firm proxy statements (DEF 14A and DEFA 14A) through SeekEdgar for mentions of a risk committee using the various forms that the name could take.

In Table 1, we show in Column 1 the number of banks we have in our sample for each year. The number of banks that meet our sampling criteria falls from 685 in 2003 to 410 in 2018. This decrease is not surprising as there are more mergers of existing banks than bank IPOs. We report next the fraction of banks with a risk committee by year in Column 2. This ratio for our whole sample is 0.053 in 2003. It increases dramatically over our sample period as it peaks in 2017 at 0.597 and goes to 0.559 in 2018. It is noteworthy that the ratio increases the most from 2008 to 2009, when it increases from 0.137 to 0.245. In other words, the fraction of banks having a risk committee increases by 78.8% from 2008 to 2009. We turn next to data for large banks. Large banks are banks with assets exceeding $10 billion. These are banks that, if organized as bank holdings companies, are required by the DFA to have a risk committee before the regulation change in 2018. We see as expected that these banks are much more likely to have a risk committee. In 2003, 19.8% of large banks have a risk committee. The percentage of large banks with a risk committee exceeds 50% starting in 2009. Not surprisingly, all large banks in our sample have a risk committee by the end of our sample period as they are mandated by DFA to have one. The number of large banks does not change much during our sample period. In contrast, the number of small banks falls by 49%. At the same time, the fraction of small banks with a risk committee increases by 1,255% from 2003 to 2018. At the end of our sample period, 39.3% of small banks have a risk committee. Similar to large banks, the largest increase in the proportion of small banks with a risk committee is from 2008 to 2009.

The theory of Section 2 does not explain why the proportion of banks with a risk committee increases so much in 2009. A possibility is that bank boards were pushed to add a committee by bank supervisors even though it was not a requirement. Another possibility is that some bank boards may choose to have a board risk committee after it is considered a best practice. However, still another possibility is that the crisis led some banks to reassess the risks they were exposed to. It is interesting to note that non-financial firms that do not have a risk committee are likely to put one in place following a cyberattack (Kamiya, Kang, Kim, Milidonis, and Stulz, 2020). It seems plausible that the realization of rare events leads boards to put more weight on such events and pay more attention to risk management.

We next examine the determinants of whether a bank has a risk committee in the absence of the DFA requirement. For that inquiry, we have to study whether a bank has a risk committee sufficiently earlier than the adoption of the DFA so that our results are not influenced by discussions surrounding the adoption of the Act. We focus on 2006 because the results are not biased by the experience of the GFC and by policy discussions concerning changes motivated by the GFC. From Section 2, the shareholder wealth maximization hypothesis predicts that bank boards have a risk committee when they are large, when they are complex, and when they have activities for which accounting risk metrics are insufficient to assess risk. Appendix A provides a detailed definition of all the variables we use. To measure size, we use bank total assets (Total Assets). Following Laeven and Levine (2007), we measure Bank Complexity by one minus the absolute difference between net interest income and other operating income divided by total operating income. With this measure, a bank is more diversified as the operating income it derives from net interest is closer to its other operating income. If net interest income equals the other operating income, Bank Complexity is one. Bank Complexity decreases as other operating income differs from net interest income. If all of the bank's operating income is net interest income, Bank Complexity is zero. Lastly, accounting metrics are generally quite inadequate to measure the risk of trading activities, so that we would expect banks with more trading activities (Trading/Assets) to be more likely to have a risk committee. The entrenchment hypothesis predicts that a bank board beholden to the CEO is less likely to have a risk committee, as one would expect the CEO to value discretion. To measure entrenchment, we use the co-option measure from Coles, Daniel, and Naveen (2014). This measure (Entrenchment) is the fraction of board members appointed after the appointment of the current CEO.

Panel A of Table 2 shows the characteristics of banks in our sample that have a risk committee in 2006 and those that do not. As expected from the shareholder wealth maximization hypothesis, banks with a risk committee are much larger (Total Assets), have much more non-interest income (NII/Assets), have more trading assets (Trading/Assets), and have a higher value for our index of complexity (Bank Complexity). Also, banks that do not have a risk committee have higher tail risk (Tail Risk), stock return volatility (Equity

Volatility), and more capital (Tier 1 Ratio). They also have a lower return on assets (ROA) and on equity (ROE).

In Panel B of Table 2, we report the correlations between the variables we use in our regressions and whether a bank has a risk committee. We find that having a risk committee (RC) is highly correlated with Total Assets and with the ratio of trading assets to total assets (Trading/Assets). However, Total Assets is also highly correlated with Trading/Assets and with Bank Complexity.

To assess more directly the relation between bank characteristics and the existence of a risk committee, we estimate a logistic model where the dependent variable RC is whether a bank has or does not have a risk committee in 2006. We report the results in Table 3. A difficulty with estimating the regressions is that, as shown in Panel B of Table 2, Bank Complexity, Trading/Assets, and Deposits/Assets, and NII/Assets (non-interest income to assets) are all highly correlated with size (Total Assets) in absolute value. For example, the correlation between Total Assets and NII /Assets is 0.2763. To minimize the multi-collinearity problem we estimate first a regression where we include few variables. These variables are Bank Complexity, Entrenchment, Total Assets, Tier 1 Ratio, and Market-to-book. The results of this estimation are presented in Column (1). We find evidence supportive of the shareholder wealth maximization hypothesis. Bank Complexity and Total Assets have the predicted significantly positive coefficients. In contrast, we do not find support for the entrenchment hypothesis. The coefficient on Entrenchment is not significant. The coefficient on the Tier 1 capital ratio (Tier1 Ratio) is significantly negative. It suggests that firms with more capital are less likely to have a risk committee. This is consistent with the view that capital can substitute for risk management. A concern is that excess capital could be evidence of entrenchment. However, banks with more capital are typically banks with a valuable deposit franchise, so that having more capital for these banks is consistent with shareholder wealth maximization.

In Column (2), we add NII/Assets, Trading/Assets, and Deposits/Assets. We find that the only added variable that has a significant coefficient is Trading/Assets. That variable has a positive and significant coefficient as expected from the shareholder wealth maximization hypothesis. However, when we add these explanatory variables, the coefficient on Bank Complexity is no longer significant.

Columns (3) and (4) re-estimate the regressions in Columns (1) and (2) on the sample of large banks. The sample of large banks is much smaller, which may explain why only the ratio of trading assets to assets (Trading/Assets) is significant. As expected, the coefficient on that variable is positive and significant. Hence, large banks with more trading assets are more likely to have a risk committee.

It follows from the results presented in this section that the fraction of banks with a risk committee increases before the passage of the DFA, so that for large banks the fraction exceeds 50% in 2009. As expected from the shareholder wealth maximization theory of risk committees, the banks that are more likely to have a risk committee in 2006 are more likely to be large banks, more complex banks, and banks with more trading assets. There is no evidence that managerial entrenchment is an important factor in preventing banks from having a risk committee before the passage of the DFA.

Section 4. Are financial institutions with risk committees less risky?

In this section, we investigate whether financial institutions with a risk committee are less risky and perform better. Such an investigation is problematic to start with. One would like to compare an institution with a risk committee to the same institution without a risk committee at the same time. However, such an exercise is not possible. As a result, when comparing the performance and risk of a bank with a risk committee to a bank without a risk committee, one may be comparing different banks and hence attribute differences in performance and risk to the existence of a risk committee when these differences are explained by unobserved firm characteristics.

To try to compare banks with a risk committee to similar banks, one approach used in the literature is to compare financial institutions around the $10 billion threshold after the DFA mandate becomes effective (Balasubramanyam, Daniel, Haubrich, and Naveen, 2019). An institution with $11 billion of assets should not be very different from an institution with $9 billion in assets, but the larger institution is required to have a risk committee. Balasubramanyam et al. (2019) find no evidence that firms required by the DFA to have a committee that did not have one experience a decrease in stock return volatility. They also use estimation with instrumental variables and find similar results. Aebi, Sabato, and Schmid (2012) investigate

how the performance of banks during the GFC relates to risk management governance. They find that banks where the Chief Risk Officer (CRO) reports to the board rather than to the CEO perform better. In their main regressions, there is no relation between bank performance and the existence of a risk committee. In a subsidiary regression, they find that banks with more meetings of the risk committee in 2006 perform better but then banks with a risk committee perform worse. Lastly, Ellul and Yerramilli (2013) construct a risk management index and show that banks with a higher risk management index, namely firms with more attributes that the authors consider to stand for good risk management, have lower tail risk and better performance during the GFC. In their index, they have two variables related to the board committee responsible for risk oversight. Over the period that they consider, that committee could be the audit committee for some banks and a risk committee for other banks. One variable is whether the committee has somebody with risk expertise and the other variable is how active the committee is. Their sample includes the top 100 bank holding companies, but they have the required data for only 72 bank holding companies.

Unlike the earlier literature, in this paper we are interested in whether banks that exceed the DFA threshold differ in risk and performance if they have a risk committee. We construct our sample including only banks from the time that they exceed $10 billion in assets. We first investigate whether banks that exceeded the threshold in 2006 and had a risk committee performed better and had less risk during the GFC than banks that exceeded the threshold but did not have a risk committee. We then test whether banks that meet the threshold perform better and have less risk after the addition of a board risk committee for banks that add the risk committee before the end of 2010 and banks that add the risk committee after 2010, respectively. The banks that add a risk committee to their board after 2010 do so when they know that such a committee is mandated by the DFA and that they will have to add such a committee by the time the Act mandate is required to be fulfilled.

Section 4.a. The performance of banks during the GFC and board risk committees

Had the DFA mandate been fully implemented in 2006, would banks have performed differently during the crisis? In 2006, 34 out of 95 banks meeting the DFA threshold had a risk committee. These banks are

similar in that they all have more than $10 billion in assets. However, they could still differ along many dimensions. To assess whether these banks perform differently and have different levels of risk during the GFC, we control for variables that capture bank differences. These variables are Bank Complexity, Total Assets, Tier 1 Ratio, Market-to-book, NII/Assets, Trading/Assets, Deposits/Assets, Securities/Assets, CI loans/Assets, Real Estate/Assets, and Charge-offs/Assets. If these variables captured differences across banks exceeding $10 billion of assets, in a regression of performance and risk measures on these control variables, the coefficient on an indicator variable for whether a bank has a risk committee would measure how the dependent variable differs because of a bank having a risk committee. The dependent variables that we use are three variables measuring performance and three variables measuring risk. The performance variables are ROA, ROE, and Annual Stock Return. The risk variables are stock return volatility (Equity Volatility), Tail Risk, and volatility of ROE (Earnings Volatility).

Table 4 reports our regression estimates where the dependent variables are measured from 2007 to 2009 and the independent variables are for 2006. We estimate the regressions with indicator variables for 2008 and 2009. The coefficient on the risk committee indicator (RC) is only significant for annual stock volatility, but the coefficient is positive rather than negative. There is no evidence that banks with a risk committee in 2006 subsequently performed better or had less risk during the crisis. The only variables that are consistently significant are the Tier 1 Ratio and Market-to-Book. Banks with more capital perform better and have less risk. Banks with higher Market-to-Book also perform better and have less risk. We alternatively estimate the regressions without the indicator variables for 2008 and 2009 (not reported). Doing so does not change our results except that banks with more commercial and industrial loans (CI loans/Assets) have less risk.

A concern with the regressions of Table 4 is that banks with a risk committee differ from other banks in ways we do not observe. These differences might be associated with higher risk metrics during the crisis and correlated with the existence of a risk committee. If we were able to control for these unknown differences in a regression such as the regression presented in Column (4) of Table 4, the coefficients on the risk committee indicator in the regressions for risk variables could become negative, so that having a

risk committee would have the effect of reducing the risk of a bank during the crisis. Note that differences among banks that do not affect bank risk during the GFC are not of concern. However, it is not impossible that banks that were vulnerable to developments in financial markets that ultimately caused the crisis decided to invest more in risk management by 2006. Hence, these banks would have put in place a risk committee because they had characteristics that would lead to greater risk in the event of a crisis. One way to address this issue is to re-estimate the regressions in Table 4 using an indicator for whether a bank had a risk committee as of 2003 rather than 2006. In this case, it would be less likely that a bank would have a risk committee in place in 2003 because it anticipated having more risk during the GFC. When we re-estimate the regressions in Table 4 with an indicator variable for whether a bank has a risk committee in 2003 (instead of 2006), we find similar results (except that the coefficient on RC in 2003 for the ROE regression is significantly negative) and no evidence that having such a committee is associated with lower risk (untabulated).

In summary, the estimates of the coefficients on RC (the indicator variable for the existence of a risk committee) in Table 4 are not significant except that the coefficient on RC is significant and positive for equity volatility. Therefore, our evidence does not support the hypothesis that the existence of a risk committee causes a bank with assets in excess of $10 billion to have less risk.

Section 4.b. The impact of risk committee introduction

We now investigate how a bank changes with the introduction of a risk committee. Consequently, we compare a bank with a risk committee to the same bank without a risk committee. As in our GFC analysis, we control for bank characteristics that might change over time. However, we now have both bank and year fixed effects. The bank fixed effects control for unobservable bank characteristics that persist through our sample period. Our sample period is from 2003 to 2018. We regress bank performance and bank risk on our controls for bank characteristics and on two risk committee indicator variables. The first risk committee indicator variable, RC before 2010, takes the value one if a bank has a risk committee and the risk committee starts before the end of 2010. This indicator variable corresponds to voluntarily adopted risk committees.

In contrast, the other indicator variable, RC after 2010, takes value one if a bank has a risk committee and the committee starts after 2010. It is an indicator variable for risk committees put in place after it became clear that the banks without a committee would have to introduce such a committee.

Table 5 shows the regression estimates. For the performance regressions, we find no significant coefficient on RC before 2010. For the banks that introduce a risk committee after 2010, ROA is higher and Annual Stock Return is lower. In the risk metric regressions, none of the coefficients on the risk committee indicator variables are significant. It follows that there is no basis to conclude that the introduction of a risk committee changes the risk of a bank. Four variables are significantly associated with annual stock volatility (Equity Volatility) and Tail Risk. Three of these variables are negatively associated with the risk measures. They are the Tier 1 Ratio, Market-to-Book, and Deposits/Assets. One variable is positively associated with the risk measures. It is the ratio of real estate loans to assets (Real Estate /Assets).

In conclusion, the analysis of this section provides no evidence supportive of the hypothesis that, among banks that meet the DFA criterion for having a risk committee, banks have lower risk after introducing a risk committee. Banks with a risk committee did not have less risk during the GFC. Further, neither banks that add a risk committee before the adoption of the DFA nor banks that do so afterwards when they face a deadline to do so experience a decrease in risk after adding the risk committee.

Section 5. What do board risk committees do?

The theory presented in Section 2 predicts that banks that are more complex are better able to maximize shareholder wealth subject to regulatory constraints with a board risk committee (shareholder wealth maximization hypothesis). When banks are less complex, accounting data provides the relevant risk metrics, so that a risk committee is not required to ensure that risk metrics are reliable as the audit committee does that already. In this case, a risk committee could actually decrease the performance of the board by creating barriers to communication and engagement. However, for more complex banks, the appropriate risk metrics are not produced as part of the bank's accounting processes. These risk metrics are complex

and specialized. Consequently, the board benefits from having a committee that ensures that the board can rely on these risk metrics and that the organization uses them properly.

In this section, we investigate directly what risk committees do and whether it corresponds to what we would expect them to do with our shareholder wealth maximization hypothesis. Such an analysis could be conducted in one of two ways. First, we could use a survey approach where we send questionnaires to chairs of risk committees. Second, we could use a more qualitative approach where we interview risk committee chairs. Each approach has costs and advantages. However, the questions we are most interested in require detailed answers and follow-up questions, which is not possible with a survey. We therefore conducted in-depth interviews with twenty risk committee chairs of publicly traded U.S. financial institutions.

Section 5.a. The sample of interviews

The potential sample of interviewees was developed by starting from a list of all U.S. publicly traded firms whose proxy indicated that the firm had a board committee whose name included the word "risk" as of November 2016 and had an SIC code in the 6000 group. After requesting company information and the name of the chair of the board committee with the word "risk" in its name, we ended up with 203 firms. We then identified twenty interviewees through cold-calling (9), being a direct contact of a coauthor (1), or an indirect contact (10). While we acknowledge that this is a convenience sample, we have no *ex-ante* reason to believe that it biases any of our findings. This approach is consistent with other interview studies on board committees, including, for example, Clune, Hermanson, Tompkins and Ye (2014). Of these 20 firms, 14 were depository institutions, of which 10 were commercial banks and four savings institutions. We refer to this subsample collectively as banks. Much of our investigation focuses on these 14 banks. The median market capitalization of the participating firms is $3.6 billion and the mean is $18.7 billion. The median asset size is $20.2 billion. Of the 20 participating firms, 12 are mandated to have a risk committee by the DFA.

The interviews were done in 2017 by one coauthor and conducted by phone (14), videoconference (2), or face-to-face (4). We used the semi-structured interview method as advised by Radcliffe (2010) among

others. This approach relies on an interview script with mostly open-ended questions that result in back and forth conversations between the interviewer and interviewee. To ensure accuracy, we recorded each interview and sent it to a professional transcription service. The service signed a confidentiality agreement and destroyed all recordings and transcripts upon our receipt of each transcript. To promote candor in the interview, we agreed to write the paper in a manner such that neither the interviewee nor the financial institution could be identified. Furthermore, we agreed to send the interviewee a draft of the paper prior to submission for publication so he or she could verify this anonymity. The average interview length was 139 minutes, and we believe that the number of interviews was appropriate in that there were few new insights gained from the last few interviewees.[5]

Our interviewees included twenty risk committee chairs. All except for one of the chairs were men. Fifteen chairs had an advanced degree. The most frequent graduate degree was an MBA or other master's degree. About half of the committee chairs interviewed studied business. Five chairs had a law degree. Only one chair had a risk management certification. Half the chairs were retired and only one had been a chief risk officer. Six of the ten non-retired chairs were CEOs of some other firm. Though the typical risk committee chair served on one public board only, he/she had substantial board experience as the median number of board-years was 15.5.

Section 5.b. Risk committee charters

A risk committee charter, approved by the board, is essentially a written "job description" of the risk committee. We received risk committee charters for most of the banks in the sample; however, we do not cite those charters, as this approach would potentially result in identification of these banks. Instead, we discuss the risk committee charters at three non-participating banks.

The three banks we consider are Bank of America, Huntington Bancshares, and JPMorgan. All three banks are subject to DFA's enhanced supervision as their assets exceed $50 billion. Each charter makes it

[5] Lincoln and Guba (1985, 235) suggested that about 12 properly selected interviews usually "will exhaust most available information".

clear that the risk committee's role is to oversee. In the case of Bank of America, the committee is "responsible for overseeing the Company's overall risk framework, risk appetite and the Chief Executives Officer's, the Chief Risk Officer's and senior management's identification of, measurement of, monitoring of, and control of key risks facing the Company, including strategic, credit, market, liquidity, operational, compliance and reputational risks."[6] Huntington Bancshares states that it has a joint risk committee for the holding company and the bank subsidiary.[7] The risk committee is "responsible for assisting their respective boards of directors as applicable (…) in overseeing" the Company's risk management function and organization. The charter expressly says that the overseeing function is the committee's "sole and exclusive function," adding that management is responsible for "designing, implementing and maintaining an effective risk management program." Finally, the purpose of the JPMorgan's risk committee is "to assist the Board in its oversight of management's responsibility to implement an effective global risk management framework".[8]

In addition to the broad purpose of the committee, each risk committee charter has a list of duties and responsibilities. These duties and responsibilities generally specify oversight tasks for the committee. The charters of the three risk committees discussed above are almost completely focused on the monitoring function of boards. We reviewed the charters of the risk committees of the participating financial institutions that were available to us (17 out of 20), and they are very similar in their emphasis on the oversight role of the risk committee.

We find that in all cases the chief risk officer reports to the risk committee in some form. At Bank of America, the risk committee "approve[s] the appointment and removal of the Chief Risk Officer, annually review[s] the Chief Risk Officer's performance and independence". At Huntington, the "Committee shall appoint and remove, as required, the chief risk executive, approve the chief risk executive's compensation,

[6] Bank of America Corporation, Enterprise Risk Committee Charter, as of January, 2020.
[7] Huntington Bancshares Incorporate, Joint Risk Committee Charter, as of January 2020.
[8] JPMorgan, Risk Committee Charter, as of January 2020.

and review the performance of the chief risk executive annually." Finally, at JPMorgan, the Chief Risk Officer (CRO) reports to both the CEO and the risk committee.

In summary, the charters we consider make clear that the risk committee has an oversight or monitoring role. To enable the committee's oversight, they further contain significant provisions that empower the risk committee relative to the CEO. In general, the CRO reports in some form to the risk committee, which diminishes the role of the CEO. The three charters also make clear that the risk committee has no management role. Instead, it focuses on the oversight of risk-management frameworks, processes, and metrics.

Section 5.c. Why do boards have risk committees?

Thirteen of our interviewees were aware of some of the history underlying the formation of their risk committee. Four of these were mandated under the DFA while nine stated that the committee was voluntary and/or existed prior to the DFA.

As expected, quotes from interviewees with voluntary risk committees are consistent with the shareholder wealth maximization hypothesis. Interestingly, one interviewee provided evidence potentially consistent with the entrenchment hypothesis as an earlier CEO was opposed to the introduction of a risk committee:

> *"The former CEO had been quite resistant to the formation of a risk committee. The new CEO warmed up to it in his first couple of years in the position, and from the standpoint of his recognition of a risk committee being a best practice and a growing awareness on the board that the formation of a risk committee was a best practice, we got there."* NYSE Bank RC Chair (#17)

Even on boards mandated to form a risk committee, only one interviewee told us that they would revert to housing risk in the audit committee if the mandate were lifted. Consistent with the shareholder wealth maximization hypothesis, the following two quotes recognize the value of a dedicated risk committee as a bank becomes more complex. In particular, the metrics overseen by an audit committee and a risk committee are different, and furthermore, the audit committee does not have the capacity in terms of both time and committee qualifications to provide an appropriate focus on risk:

"Even if that Dodd-Frank hadn't occurred, some of us would have evolved a risk committee. It's just too much on the audit committee. (…) Also, the RC needs a little different skill set than financial expertise needed on an audit committee." NYSE Bank RC Chair (#10)

"It would be very difficult to do with a bank of that size and complexity not to have a separate Risk Committee. In addition to risk issues related to size and the complexity of the business, a commercial bank also needs to meet all the regulatory requirements. Meetings would get too long if audit and risk are housed in one committee. Also, the skills, knowledge, and experience that are required to be a good Chair of an Audit Committee don't necessarily translate over to be a good Chair of a Risk Committee." NYSE Bank RC Chair (#13)

Section 5.d. Assessing risk metrics and risk management processes

Risk committee chairs view the tasks of the risk committee to be quite different from those of the audit committee and believe that different skills are involved. As discussed in Section 2, risk metrics are forward-looking. Risk chairs are also acutely aware that there is no rule book like GAAP for risk metrics. This is exemplified by quotes from two different committee chairs:

"If we can envision driving down the road – risk committee members are looking out the windshield and looking for hazards in the road, roads to turn on and the other committee is looking in the rearview mirror to see what has gone on before." NASDAQ Bank RC Chair (#11)

"The audit committee job is to think inside the box. Financial standards, FASB rules, Sarbanes-Oxley, SEC disclosure. Those are written rules that you have to abide by. So you really want to think inside the box. You don't want to think outside of it. It's accounting. But with the risk committee, your job is to think outside the box, to expect the unexpected, to anticipate what's going to come around corners, to look forward. Those two perspectives and skill sets are very different." NASDAQ Non-Bank Financial Institution RC Chair (#6)

Given the differences in the responsibilities inherent in the audit committee and the risk committee, our interviewees generally reasoned that the portfolio of skills available to each committee should be different:

"The ideal committee membership on an RC should look different from that of an AC. On an audit committee, you clearly want financial experts, but if your whole audit committee were structured with the kind of people that makes the most effective audit committee, then you don't have anybody on the audit committee who is a risk taker." NYSE Bank RC Chair (#2)

"The ideal characterization of an audit committee is one in which the leadership has extensive accounting experience. (…) By contrast, in the risk committee, I think you ought to be looking at the array of activities of the institution, and whether you have expertise on the board that spans that array. So for example, in a money center institution where you try very hard to have not only banking expertise, but markets expertise, trading expertise, broker/dealer expertise, all of which allows you to understand the various business activities in a way that is deeper in understanding. When someone's talking about derivative trading activity, it's particularly useful to have someone who understands derivatives and trading, and likewise in various kinds of lending activities, having someone that understands credit markets." NYSE Bank RC Chair (#4)

When we asked the interviewees for their views of their actual or desired skill sets on the risk committee, diversity of thought and skills/experience was a common theme:

> *"The diversity of talents and background are really important. We've got two current CEOs and a retired CEO of larger, complex financial institutions. They've been responsible for managing risk at their organizations and they've seen what's worked and what hasn't worked."* NYSE Bank RC Chair (#13)

> *"Operating banking experience is extremely helpful. General business experience (being the CEO of some company of whatever industry) is helpful. CEOs have to understand and have to act on things like culture, risk, business opportunities and bullshit. (…) Having somebody there who's an outsider and an expert in IT is really helpful on a risk committee because there's so much risk in IT."* NYSE Bank RC Chair (#15)

In sum, our interviewees serving on risk committees recognized that their responsibilities differed sufficiently in nature from those on the audit committee, and therefore warranted a different portfolio of skills to fulfill their risk oversight responsibilities. This is consistent with the shareholder wealth maximization hypothesis. Furthermore, it contradicts the entrenchment hypothesis to staff the risk committee with members that have a portfolio of qualifications that empowers them to effectively conduct its oversight responsibilities.

Section 5.e. How does the committee acquire information?

How the committee acquires its information directly influences whether the information is relevant, timely, and credible. With our theory, the primary role of the risk committee is to ensure that the board as a whole can rely on risk metrics, so that it can evaluate whether the bank is taking the risks that it says it is and that these risks are consistent with the board's accepted risk appetite. The risk committee's mandate under the DFA is that it is responsible for the risk management framework. A critical part of the risk management framework is the production of risk metrics that are essential for a bank to make sure that its risk-taking matches its risk appetite and for the board to be able to assess whether the bank is managed that way. With this role of the risk committee, it is therefore never enough, under the shareholder wealth maximization hypothesis, for a risk committee to simply discuss and assess reports prepared by management. The risk committee has to make itself comfortable that the information provided is accurate

and truthful. This requires the bank to have a process that leads to the production of accurate metrics and that the functioning of these processes is not distorted by management. From this perspective, it is therefore essential that the risk committee acquire information by interacting directly with bank personnel. These interactions are generally undertaken by the chair of the risk committee. Nineteen of our interviewees responded to a question of whom they interact primarily with at the firm, and all of them state that they interact primarily with the CRO. For 16 of the 19, these interactions were both in person and by phone.

A common theme among the interviewees is the importance of having a good relationship with the CRO. As reflected in the quote below, the importance of a healthy relationship is fundamental since it promotes relevant information being communicated from the CRO to the risk committee chair in a timely manner:

> *"You have to be comfortable that you can pick up the phone or they can pick up the phone and say, "There's something going on, or something you should be aware of," and over time, that develops a comfort level with the senior person in the function and in this case, it's the CRO. I don't think the CRO of this institution or any of the big institutions could exist or continue to exist if the chair of the risk committee or some of the senior people on the board started to feel that they were not straightforward and not effective in communicating the risk that they are trying to manage. So I think the relationship is very important and as the relationship gets better, surprises, which occur naturally, end up being communicated early."* NYSE Bank RC Chair (#4)

To develop such a relationship, interviewees visit the company and the CRO between meetings. To enhance the information available to them, some interviewees also stress the importance of interactions/relationships with risk people below the CRO:

> *"Risk oversight is like everything else, you can get reports and you can be very comfortable when you see the risk – chief risk officer's report that has, you know, green, green, green, green, everything's great, okay, and maybe one or two yellows and what not, but it's important that you understand the people that are putting that together…… and the reason for going lower in the organization is that then you can make a judgment on the kind of people that this person up here hires, because that makes a difference, you know."* NYSE Non-Bank Financial Institution RC Chair (#5)

> *"You really have to have those meetings with key people in the organization and even one step below the leader in an organization so that way you can make sure what you're hearing is aligned – ask those key questions to those people and see if you get consistent answers." NASDAQ Bank RC Chair (#16)*

CEOs can be reluctant to have board members interact directly with employees of the corporation without the CEO present. No interviewee discussed situations where the CEO erected obstacles to direct

interactions with personnel of the risk function. Our interviewees were largely confident that their processes resulted in the committee discussing the "right" issues with the "right" information. When we asked them to assess their level of confidence on a scale of 1 (low) to 5 (high), the range of the answer was from 3 to 5 with a mean response of 4.4 for the "right" information and 4.5 for the "right" issues.

Section 5.f. The interactions of the risk committee with management and regulators

If a risk committee is operating in a manner to maximize shareholder wealth subject to regulatory constraints, it will not only monitor the execution of the bank's approved risk policies, but also act in an advisory capacity towards management. Furthermore, the risk committee's processes should promote a relationship with its regulators that results in meeting regulatory constraints, while at the same time pursuing a level of risk that is consistent with maximizing shareholder wealth. In this section, we examine how our interviewees interact with management, how they balance the monitoring versus the advisory role of the risk committee, and how they interact with regulators.

Section 5.f.1. The monitoring, advisory and collaborative dynamics of the risk committee

Though risk committee charters formalize and delineate the risk committees' responsibilities with a heavy emphasis on risk monitoring, our interviews reflect that the committees also advise and collaborate with management, while being cognizant not to slip into a management role. On the role of the committee versus management, our interviewees were clear that it was the job of management and not the committee to execute the board's approved risk policies:

> *"So, our job is to look at policies and make sure that they are setting an appetite that – setting the bounds or the barriers on the road, so to speak, that management has to drive in, and then our second function is to review programs that we have in place to manage risk, mitigate risk, or monitor risk, and make sure that we think that they're covering everything that needs to be covered –, but our job is not to actually manage any of the risks, and, so, I think it's a pretty good, clear distinction."* NYSE Bank RC Chair (#2)

> *"We are oversight and the mechanics of how management runs the bank is their responsibility. We're there to make sure that they effectively run it, in conjunction with our policies and procedures."* NASDAQ Bank RC Chair (#17)

When asked how challenging it is to not cross the line into the management role, on a scale of 1 (not challenging) to 5, the mean response was 1.5. While the interviewees understood and abided by the respective committee and management roles, there were many examples in which they would not only monitor, but also collaborate with and advise management. For instance, risk committee members at times would have better information about developing risks in industries that the bank interacted with than the bank's risk management team and would convey that information to bank risk managers.

Given the importance of a good relationship between the CRO and the committee, it is not surprising that the dynamics of that relationship would include both advice and collaboration. It is known from the literature that there can be a tension between the monitoring and advising roles of board members. More focus on monitoring can make it difficult for the board to advise management, as management may be unwilling to communicate information to the board that would help both the board's advising role and its monitoring role. When we asked interviewees on a scale of 1 (easy) to 5, how difficult it is to maintain a sense of healthy skepticism in the relationship, the mean response was 2. One interviewee credited the good relationship and the ability to maintain a level of healthy skepticism to the high quality of the CRO. Another placed the responsibility of healthy skepticism on the shoulders of the chair and committee members:

> *"Fortunately in our case here, the chief risk officer is very, very confident and we have a very good relationship and so it's easy for me to do that* [maintain healthy skepticism]. *Where I have risk responsibility – some responsibilities at other banks, it's not quite as easy generally because the confidence level of the person may not be what it is here.* NYSE Bank RC Chair (#15)

> *"It is really important that a Chair and the members bring a level of professional skepticism, you know, to this work so that, you know, they're continuously on the critical things testing management, testing management's approach, thought processes, et cetera. You can't be afraid of conflict."* NYSE Bank RC Chair (#13)

When we asked our interviewees how often the committee disagreed with management on elements of risk policy, on a scale of 1 (never) to 5, the mean response was 1.7, indicating little conflict. A number of the interviewees attributed this lack of conflict to both the quality of management and the processes that precede any potential conflict:

> *"Typically, before anything is important, there have probably been some conversations before, maybe, to get some input from the committee chairs. I can't recall any incidents where there's been a real rigorous disagreement or debate. When management comes forward with recommendations*

around the risk appetite and tolerance, there's consensus, partly because we have a lot of confidence in the competence of our top people." NYSE Bank RC Chair (#8)

"We have a management-led process first, and, whatever is being presented by the CRO, CEO or CFO at our committee meeting, it's a collaboration of the staff to make sure that this is all well thought out, fully baked, appropriate, and at appropriate levels. All that process has developed over a number of years and it's pretty straightforward that we don't have to have any debates over which direction we're headed." NYSE Bank RC Chair (#15)

In short, although the charters stress the oversight or monitoring role of the committee, its practices include monitoring, collaboration and advice, and this dynamic appears to result in few risk policy disagreements between the committee and management. One committee member summed it well by recognizing the "watchdog" role of the committee, while also appreciating that both the committee and management are "trying to assure the success of the enterprise". It is reasonable to argue that this is consistent with the shareholder wealth maximization hypothesis:

"You're both just trying to assure the success of the enterprise. And you're not like a watchdog, you know, I mean, though, I guess that is part of your role, but that's not what you're primarily there to do. You really there just to make sure everything runs smoothly, and the company effectively manages risk. You know, finding out the CRO relationship is a collaborative relationship, I guess, is what I'm trying to say. I think it's very important." NYSE Bank RC Chair (#8)

Section 5.f.2. The relationship between the risk committee and the regulators

Bank supervisors, and more generally bank regulators, influence bank risk committee processes with access to the risk committee agendas as well as interactions with the risk committee chair. Such a relationship between risk committees and regulators could be problematic. It could lead the risk committee to push a more conservative agenda on the bank that might not be in the interests of shareholders but might be favored by regulators. Since the regulatory environment differs between banks and non-banks, we limit our discussion in this section to the fourteen banks in our sample. At the same time, we recognize the differences in the regulatory environment within our sample of banks that vary from small to large and have both state and federal charters. Within this spectrum, we find both differences as well as commonalities on issues that risk committees face in their respective regulatory environments.

We asked the interviewees to assess the time spent on regulatory issues. The interviewees report that their committees spend a mean (median) of 50.1% (50%) of the meeting on regulatory issues. The discussion of the interviewees related to regulation are focused on making sure that the firm meets the regulatory mandates. Financial firms face regular inspections and much of the time in the meeting is spent dealing with issues that may arise from a recent inspection or in preparation for an upcoming inspection. An additional consideration that some chairs discussed is the Dodd-Frank Act Stress Test (DFAST). Some committees had to devote substantial amounts of time to DFAST.

As expected, the interviewees from larger banks expressed significant challenges in fulfilling their risk committee responsibilities relative to the smaller banks.[9] Even smaller banks, however, expressed challenges. The risk committees appear to have a large regulatory agenda over which they do not seem to have much discretion. Further, because of regulatory ambiguity, they have to engage with regulators to make sure that they are addressing the regulatory issues as regulators expects them to. The following quotes make that clear:

> *"We meet with the regulators and get their feedback about their sense of priorities to be sure we're going deep enough on the things that are top of their list. I also talk about it at pre-meeting conversation with the CRO." NYSE Bank RC Chair (#8)*

> *"We need to cover regulatory issues regardless of whether we finish on time or not." NASDAQ Bank RC Chair (#11)*

In spite of a challenging regulatory environment, some of our respondents cited positive aspects to that environment. The following two quotes are from a large bank and a small bank, respectively:

> *"A very small percentage of meeting time is "check the box" regulatory. We tend to be more careful in the documentation and the discussions because we are aware of the fact the regulators are looking for evidence of credible challenge. These are important issues. They're not checking the box, but they are time consuming."* NYSE Bank RC Chair (#4)

> *"It isn't so much about pleasing the regulator as the regulators are concerned about these things for a reason and that's why they're on our agenda."* NYSE Bank RC Chair (#2)

[9] For the sake of anonymity, in this section we define small banks as under $10 billion in assets and large banks as "significantly" over $10 billion. The smallest bank in our sample is $3 billion in assets. We are intentional in not being more specific.

Some interviewees described circumstances when, if appropriate, they would push back against the regulator. However, even when the interviewee believed the pushback was warranted, there were instances in which the regulator prevailed:

> *"One of the things we always start with the regulators is to remember we are oversight, not management. So they always push to get things into the presentations, sometimes when we have the conversation, 'Why didn't you give instructions on this?' It's not my job to give instructions on this. It's my job to give oversight to management." NYSE Bank RC Chair (#10)*

> *I think sometimes the regulators put us in a position to focus on areas that are, to me, not as risky as some of the areas and the focus that we'd rather spend…. If I could change it, I think I'd be a hero in the industry."* NASDAQ Bank RC Chair (#16)

A commonality across all the bank interviewees we asked was that there was some form of direct regulator interactions either between meetings by the risk committee chair and/or at a meeting of the full board:

> *"I've had the head of the FDIC, or Head Examiner, request a call. And the call was all about our processes and the committee."* NYSE Bank RC Chair (#13)

Management of the relationships with regulators seemed to be a topic that risk committee chairs were quite focused on and it was clear that part of the reason for doing so was that regulators could make life difficult for the risk committee specifically and the bank more generally:

> *"You don't want to antagonize them because then they'll make it very difficult for your company when they go for review. But you want to have an open and honest eye look, and for the most part most of them are pretty good at that."* NYSE Bank RC Chair (#10)

> *"I came from a very heavily regulated industry and I understand regulation, the responsibility of the regulator, and that my job is to make him the best regulator that he possibly can be. Which means I don't ever surprise him or ever embarrass him. I always give him a heads up. And I never give my customer a reason to complain to him. If I'm successful in those areas, I'll be fine in a regulated industry. You gotta create a culture that has respect and you can't have people that disrespect the regulator."* NYSE Bank RC Chair (#1)

To summarize, our interviewees expressed a blend of both positive and negative aspects to their regulatory environments. Positive aspects included regulators forcing focus on important issues. Negative perspectives included concerns that regulatory topics crowded out time for the committee to focus on issues they may have felt to be more important. In addition, regulators may pursue an agenda inconsistent with the appropriate role of the risk committee or chair, and in these instances the interviewees would either push back or accept the will of the regulator.

Section 6. Conclusion

The Dodd-Frank Act (DFA) mandated banks exceeding a size threshold to have a risk committee. The presumption was that banks would take less risk with more attention to risk-taking at the board level. We are not aware of academic support for that presumption. More attention to risk-taking could equally push management to take more risk as well as less risk. Therefore, we would not expect that a bank would become less risky simply by having a risk committee. With a risk committee, we would expect the bank to be more likely to take risks consistent with its risk appetite and strategy.

The academic literature has almost nothing to say about when it makes sense for a bank to have a board risk committee. We develop a theory of when a bank's shareholders would benefit from the bank board having a risk committee. However, having a risk committee has both costs and benefits. The costs are that the board as a whole may become less well-informed and less engaged with respect to risk. The benefits are that more attention is paid to how the bank measures, monitors, and takes risks by a subset of the board that generally has more specialized knowledge. We argue that the benefits are greater than the costs for large complex banks where risk management requires the use of metrics that are not produced through the accounting systems of the bank. With this view, banks that did not have a risk committee before the DFA mandate, but were required by the mandate to have one, were banks that believed that the costs of having a risk committee were higher than the benefits. An alternative view would be that these banks did not have a risk committee because management did not want oversight of risk. We call this alternative view the entrenchment hypothesis in contrast to the shareholder wealth maximization hypothesis.

We investigate empirically whether there is support for our shareholder wealth maximization hypothesis or for the entrenchment hypothesis. Using a common measure of managerial entrenchment, we find no evidence that managerial entrenchment played a role in whether a bank had a risk committee. In contrast, and as expected by the shareholder wealth maximization hypothesis, we find that larger, more complex banks are more likely to voluntarily have a risk management committee. We find no evidence for the presumption that having a bank board risk committee decreases a bank's risk. Banks that would have

been required to have a risk committee before the GFC if DFA had been in effect, but did not have one, did not perform better during the GFC. Finally, we find no evidence that a bank's risk falls when it introduces a risk committee voluntarily or because of the DFA mandate.

To gain a deeper understanding of whether our theory and large sample approach help understand the impact of the DFA mandate and the costs and benefits of having a risk committee, we interviewed 20 risk committee chairs of financial institutions, including the risk committee chairs of 14 banks. We find that the focus of risk committees is not only on oversight and monitoring as stressed in their charters, but also on advising management. As such, the risk committee chairs believed that having a strong relationship with the chief risk officer is essential. They also believed that they were able to maintain a skeptical position with respect to the claims of management, so that they were comfortable that they were able to perform their monitoring role. The chairs discussed extensively the key issue that the work of risk committees is followed closely by regulators and that risk committees have to perform a large number of regulatory tasks. Risk committee chairs interact with regulators and it seems clear that regulators at times try to push risk committees to go beyond the mandate in their charter. The risk committee chairs pointed out that some of the interactions with regulators could be beneficial in that regulators can point to issues that are important and are worthy of attention by the committee. However, it is also clear that risk committees spend an inordinate amount of time performing tasks mandated by regulators, especially for large banks.

Our theory shows that one way to think about the risk committee is that it is the audit committee for risk metrics. For smaller, simpler banks, the risk metrics are produced by the accounting process, so that they can be evaluated by the audit committee. For larger, more complex banks, risk metrics are forward looking and complicated. Their evaluation requires a different type of expertise than the expertise required of members of an audit committee. A risk committee further has to evaluate whether a bank respects risk-taking policies approved by the board. Such a task involves judgment as risk-taking policies are both quantitative and qualitative and cannot specify all eventualities ahead of time. It follows from this that risk committees can be beneficial for more complex banks in enabling their board to better assess and monitor the bank's risk-taking. As a bank board becomes more confident of how well it can assess and monitor a

bank's risk-taking, it may be willing to take more risk, so that it does not follow that having a well-functioning risk committee means that a bank will have less risk.

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Table 1: Bank Sample by Year and Risk Committee

This table reports the number (N) of banks by year and the fraction of banks with a risk committee in that year. Large Banks are those with assets above $10 billion, and Small Banks are those with total assets below $10 billion.

	All Banks		Large Banks		Small Banks	
	N	Fraction	N	Fraction	N	Fraction
	(1)	(2)	(3)	(4)	(5)	(6)
2003	685	0.053	96	0.198	589	0.029
2004	649	0.072	93	0.280	556	0.038
2005	646	0.093	99	0.292	547	0.057
2006	625	0.102	95	0.358	530	0.057
2007	592	0.118	92	0.413	500	0.064
2008	561	0.137	88	0.420	473	0.085
2009	542	0.245	92	0.565	450	0.180
2010	513	0.296	94	0.606	419	0.227
2011	494	0.360	93	0.688	401	0.284
2012	490	0.394	101	0.703	389	0.314
2013	473	0.444	102	0.697	371	0.364
2014	468	0.534	107	1.000	361	0.396
2015	455	0.558	105	1.000	350	0.426
2016	438	0.575	112	1.000	326	0.429
2017	429	0.597	120	1.000	309	0.440
2018	410	0.559	112	1.000	298	0.393

Table 2
Panel A: Descriptive Statistics for 2006
This table reports descriptive statistics for all variables in our analyses for 2006. For each variable, we show the cross-sectional mean and median for 2006. The table is separated into firms that had a risk committee in 2006 (A) and those that did not (B). The significant differences in mean (based on t-tests) and median (based on Wilcoxon tests) between banks with a risk committee and those with no risk committee are shown with *, **, *** for differences significant, respectively, at the 10%, 5%, and 1% levels. Appendix A defines all variables.

	Banks with Risk Committee (A)			Banks with No Risk Committee (B)			Difference (A-B)	
VARIABLES	N	Mean	Median	N	Mean	Median	Mean	Median
Annual Stock Return	64	0.0983	0.1040	561	0.1230	0.0942	-0.0247	0.0098
Bank Complexity	64	0.5500	0.5300	561	0.4160	0.3860	0.1340***	0.1440***
Charge-offs/Assets	32	0.0020	0.0014	55	0.0010	0.0008	0.0010***	0.0006**
C/I Loans/Assets	64	0.0852	0.0815	561	0.0150	0	0.0702***	0.0815***
Deposits/Assets	64	0.6460	0.6460	561	0.7190	0.7410	-0.0730***	-0.0950***
Earnings Volatility	61	0.0149	0.0075	555	0.0156	0.0063	-0.0007	0.0012
Entrenchment	62	0.3450	0.3060	473	0.3730	0.3130	-0.0280	-0.0070
Equity/Assets	64	9.5930	8.9230	561	9.9170	9.1310	-0.3240	-0.2080
Equity Volatility	64	20.3000	18.7500	561	24.3300	23.5200	-4.0300***	-4.7700***
Market-to-Book	64	1.9600	1.9910	559	1.8370	1.7210	0.1230	0.2700
NIM	61	3.3850	3.4400	549	3.7330	3.6700	-0.3480**	-0.2300
NII/Assets	64	0.0117	0.0060	561	0.0039	0.0017	0.0078***	0.0043***
Real Estate/Assets	64	0.2080	0.1760	561	0.0471	0	0.1609***	0.1760***
ROA	64	0.0293	0.0184	561	0.0123	0.0091	0.0170***	0.0093***
ROE	64	0.1320	0.1380	560	0.1020	0.1060	0.0300***	0.0320**
Securities/Assets	64	0.1520	0.1230	561	0.1330	0.1140	0.0190	0.0090
Tail Risk	64	2.7390	2.4850	560	3.2730	3.1670	-0.5340***	-0.6820***
Tangible Equity/Assets	64	0.0656	0.0614	560	0.0843	0.0758	-0.0187***	-0.0144***
Tier 1 Ratio	64	10.4400	10.0400	543	11.6000	10.8700	-1.1600**	-0.8300***
Total Assets (raw)	64	7.347e+07	395,694	561	5.431e+06	887.4	6.8039e+07***	394,806.6***
Trading/Assets	64	0.0288	0	561	0.0042	0	0.0246***	0***

Table 2, Cont'd:
Panel B: Correlation Matrix for 2006
This table reports the correlation matrix for the main variables in the regressions for 2006 in Table 3. Appendix A defines all variables.

	RC	Bank Complexity	Total Assets	Tier 1 Capital	Market-to-Book	NII/ Assets	Trading /Assets	Deposits/ Assets
Bank Complexity	0.1685***							
Total Assets	0.3473***	0.5003***						
Tier 1 Ratio	-0.0862**	-0.1735***	-0.2846***					
Market-to-book	0.0703*	0.1573***	0.3339***	-0.1152**				
NII/Assets	0.1020**	0.3918***	0.2763***	-0.0436	0.1203**			
Trading/Assets	0.1882***	0.2597***	0.5409***	-0.0862**	0.1218**	0.0828		
Deposits/Assets	-0.0565	-0.1807***	-0.4280***	0.0487	0.1029**	-0.1609***	-0.3260***	
Entrenchment	-0.0291	-0.0398	-0.0498	-0.0114	-0.0411	-0.0323	-0.0473	0.0047

***, **, and * indicate significance at the 0.01, 0.05 and 0.10 levels, two-tailed, respectively.

Table 3
Logit Regression for 2006

This table reports logit regressions for 2006. The dependent variable RC takes value one if a bank has a risk committee in 2006 and 0 otherwise. All Independent variables are for 2005. Large Banks have assets in excess of $10 billion. Bank Complexity is winsorized at the 1% level. *t* statistics are in parentheses. Standard errors are robust. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Appendix A defines all variables.

	All Banks	**All Banks**	**Large Banks**	**Large Banks**
	(1)	(2)	(3)	(4)
Bank Complexity	1.7690**	0.9044	0.7534	-1.5584
	(2.15)	(0.95)	(0.59)	(-1.07)
Total Assets	0.2139***	0.2659***	0.0546	0.1573
	(5.87)	(5.19)	(0.45)	(1.00)
Tier1 Ratio	-0.1592***	-0.1591***	-0.2024	-0.2770
	(-3.21)	(-2.91)	(-1.42)	(-1.61)
Market-to-Book	-0.1114	-0.3453	-0.2635	-0.8230
	(-0.44)	(-1.22)	(-0.59)	(-1.50)
Entrenched CEO	-0.0149	0.1772	0.0459	0.7269
	(-0.03)	(0.30)	(0.05)	(0.61)
NII/Assets		-3.4580		14.0747
		(-0.17)		(0.83)
Trading/Assets		17.3602**		20.1010**
		(2.45)		(2.33)
Deposits/Assets		2.6018		4.4281
		(1.43)		(1.57)
Constant	-3.0271***	-4.6221***	1.2511	-0.5786
	(-3.36)	(-3.01)	(0.49)	(-0.19)
r2_p	0.2439	0.2776	0.0584	0.1851
N	455	455	63	63

Table 4
Crisis Performance Regressions

The table reports OLS regressions for the independent variables including RC (the existence of a risk committee). Independent variables are measured in 2006 while all dependent variables are measured from 2007 to 2009. The sample includes all large banks that are defined as banks and bank holding companies with total assets greater than $10 billion. Variable descriptions are presented in Appendix A. *t* statistics are in parentheses. Standard errors are clustered at the firm level. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	ROA	ROE	Annual Stock Return	Equity Volatility	Tail Risk	Earnings Volatility
	(1)	(2)	(3)	(4)	(5)	(6)
RC	-0.0034	-0.0213	0.0065	6.4189*	0.6784	0.0049
	(-1.28)	(-0.97)	(0.13)	(1.67)	(1.23)	(0.29)
Bank Complexity	-0.0066	-0.0260	0.0361	-3.8054	-0.4932	0.0212
	(-1.21)	(-0.41)	(0.40)	(-0.49)	(-0.44)	(0.58)
Total Assets	0.0040***	0.0133*	0.0124	-0.4767	-0.0443	-0.0031
	(6.77)	(1.86)	(0.84)	(-0.43)	(-0.28)	(-0.93)
Tier1 Ratio	0.0027***	0.0245***	0.0652***	-5.3000***	-0.7578***	-0.0158***
	(3.95)	(2.66)	(4.44)	(-3.94)	(-3.95)	(-3.30)
Market-to-Book	0.0061***	0.0824***	0.1219***	-7.1890***	-0.9384***	-0.0183**
	(3.50)	(3.32)	(3.47)	(-2.88)	(-2.69)	(-2.00)
NII/Assets	-0.1117	-0.3827	0.4655	-4.5599	-3.5831	0.1466
	(-0.76)	(-0.32)	(0.18)	(-0.03)	(-0.16)	(0.23)
Trading/Assets	-0.0319**	0.1963	0.5136	-31.4187	-3.5274	-0.1551*
	(-2.54)	(1.16)	(1.45)	(-1.23)	(-0.95)	(-1.75)
Deposits/Assets	-0.0090	-0.0037	-0.1919	-14.4092	-2.3502	-0.0650
	(-0.65)	(-0.04)	(-0.88)	(-0.77)	(-0.88)	(-0.90)
Securities/Assets	-0.0219	-0.0923	-0.4128	32.8453	4.1502	0.1225*
	(-1.54)	(-0.58)	(-1.09)	(1.12)	(1.00)	(1.74)
CI Loans/Assets	0.0166	0.2467	0.5759**	-61.2341**	-8.6099**	-0.2803***
	(1.21)	(1.66)	(2.20)	(-2.56)	(-2.41)	(-2.73)
Real Estate/Assets	0.0048	-0.1502*	-0.1841	15.1184	1.3251	0.0613
	(0.62)	(-1.69)	(-1.07)	(1.18)	(0.71)	(0.93)
Char-offs/Assets	1.0114	-1.7464	-4.1156	950.1304	105.2618	-7.2825*
	(1.57)	(-0.24)	(-0.28)	(0.93)	(0.75)	(-1.66)
Crisis Year(2008)	-0.0176***	-0.1409***	-0.1342**	54.3800***	7.2508***	0.0645***
	(-7.80)	(-7.32)	(-2.63)	(19.96)	(20.06)	(4.70)
Post Crisis Year	-0.0265***	-0.1454***	0.2886***	56.7615***	7.1161***	0.0514**
	(-8.44)	(-6.35)	(4.87)	(14.34)	(13.23)	(2.61)
Constant	-0.0521***	-0.4288***	-1.1650***	108.8294***	15.8162***	0.2894***
	(-4.71)	(-2.85)	(-4.90)	(5.31)	(5.35)	(3.88)
r2_a	0.5210	0.3281	0.2432	0.6335	0.5970	0.1398
N	226	226	227	227	227	212

Table 5
Performance Regressions for Full Sample Period

The table reports panel regressions for large banks from 2003 to 2018. All independent variables are lagged by one year. Large banks and bank holding companies are those with assets above $10 billion. The variable "RC before 2010" takes value one if a bank has a risk committee and the risk committee starts before the end of 2010, while the variable "RC after 2010" takes value one if a bank has a risk committee and the risk committee starts after the end of 2010. All variable descriptions are in Appendix A. Regressions include firm fixed effects and standard errors are clustered at the firm level. *t* statistics are in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	ROA	ROE	Annual Stock Return	Equity Volatility	Tail Risk	Earnings Volatility
	(1)	(2)	(3)	(4)	(5)	(6)
RC after 2010	0.0068***	-0.3297	-0.1359*	-2.0723	-0.2604	-0.4366
	(3.26)	(-1.01)	(-1.78)	(-0.82)	(-0.68)	(-1.02)
RC before 2010	-0.0024	-0.1238	-0.0084	1.0172	0.0533	-0.1653
	(-0.91)	(-0.86)	(-0.16)	(0.40)	(0.15)	(-0.97)
Bank Complexity	0.0036	-1.5588	0.2228	-3.0151	-0.6581	-1.8632
	(0.74)	(-1.13)	(1.42)	(-0.48)	(-0.66)	(-1.11)
Total Assets	0.0017***	-0.0140	-0.0309*	0.1573	0.0571	-0.0205
	(3.85)	(-0.43)	(-1.87)	(0.16)	(0.42)	(-0.45)
Tier 1 Ratio	-0.0010**	0.0984	0.0185*	-1.2313***	-0.1943***	0.1193
	(-2.17)	(1.02)	(1.74)	(-2.68)	(-2.69)	(1.04)
Market-to-Book	0.0031**	-0.0738	-0.0553**	-6.7333***	-0.7204***	-0.2318
	(2.47)	(-0.77)	(-2.64)	(-2.92)	(-2.71)	(-1.07)
NII/Assets	0.1438***	-6.0840	0.4136	-1.4583	0.9894	15.5027
	(3.74)	(-1.04)	(0.59)	(-0.02)	(0.11)	(1.31)
Trading/Assets	-0.0023	-2.8497	0.9197***	-20.1918	-1.8866	-2.9771
	(-0.25)	(-1.14)	(2.76)	(-1.31)	(-0.89)	(-1.21)
Deposits/Assets	-0.0343***	0.8624	0.1627	-27.067***	-3.0775**	1.1503
	(-4.22)	(0.99)	(0.85)	(-2.70)	(-2.25)	(1.04)
Securities/Assets	0.0288**	-3.3698	0.4744	-6.9883	-0.8811	-4.2186
	(2.35)	(-1.06)	(1.62)	(-0.55)	(-0.54)	(-1.11)
CI Loans/Assets	0.0038	1.4801	0.4361	10.6274	0.6952	0.7786
	(0.18)	(0.96)	(0.96)	(0.37)	(0.17)	(0.62)
Real Estate /Assets	0.0128	-0.7388	-0.5629**	29.8659***	3.4484**	-0.7309
	(1.17)	(-1.26)	(-2.47)	(2.84)	(2.27)	(-1.12)
Charge-offs/Assets	-0.0876	-8.5123	13.9441***	63.7327	5.3367	-14.1507
	(-0.87)	(-0.74)	(6.20)	(0.47)	(0.33)	(-1.12)
Constant	0.0037	1.1337	0.4726	62.8784***	7.5178***	1.2259
	(0.33)	(1.23)	(1.28)	(3.48)	(2.96)	(1.02)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
r2_a	0.4294	0.0197	0.5782	0.8259	0.8241	0.0381
N	645	645	646	646	646	539

Appendix A
Variable definitions

Variable Name	Definition
Annual Stock Return	Annual return of common stock.
Bank Complexity	$1 - \left\lvert \frac{Net\ interest\ income - Other\ operating\ Income}{Total\ operating\ income} \right\rvert$
Charge-offs/Assets	Loan charge-offs and write-downs minus loan recoveries, scaled by the book value of assets.
CI loans/Assets	Commercial and industrial loans, divided by total assets.
Deposits/Assets	The sum of non-interest-bearing deposits and interest-bearing core deposits, scaled by the book value of assets.
Earnings Volatility	Annual volatility of quarterly earnings.
Entrenchment	Co-option measure from Coles, Daniel and Naveen (2014). The number of co-opted directors / Board size. Co-opted Director is one who joined the board after the CEO.
Equity/Assets	Total book value of equity, divided by total assets (in percentage).
Equity Volatility	The annualized standard deviation of daily stock returns (in percentage).
Market-to-book	Market value of equity, divided by the book value of equity.
NIM	Net interest margin.
NII/Assets	Total noninterest income minus trading revenue, scaled by book value of assets.
RC	1 if a bank has a risk committee in 2006, and 0 otherwise.
RC before 2010	1 if a bank has a risk committee and the risk committee starts before the end of 2010, and 0 otherwise.
RC after 2010	1 if a bank has a risk committee and the risk committee starts after the end of 2010, and 0 otherwise.
Real Estate/Assets	Loans secured by real estate, divided by total assets.
ROA	Net income plus interest expense divided by average assets over the prior year.
ROE	Net income, divided by average equity over the year.
Securities/Assets	Total securities divided by book value of assets.
Tail Risk	Following Ellul and Yerramilli (2013), tail risk is the negative of the average return on banks stock over the 5% worst return days in a given year.

Appendix A, Cont'd
Variable definitions

Variable Name	Definition
Tangible equity/Assets	Total equity capital minus perpetual preferred stock and related surplus, minus intangible assets, scaled by the book value of assets.
Tier 1 Ratio	The tier 1 capital ratio is the ratio of a bank's equity capital and disclosed reserves to its total risk-weighted assets.
Total Assets	Natural log of total assets in CPI adjusted year 2000 dollars.
Trading/Assets	Total trading assets divided by total assets.