

Impact of risk taking on bank financial performance during 2008 financial crisis

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ABSTRACT

This paper studies the relationship among corporate governance, risk taking and financial performance at bank holding companies' (BHCs) during the 2008 financial crisis. While the paper does not find a significant relationship between level of risk taking and corporate governance, it shows that BHCs with lower risk performed better than BHCs with higher risk during the crisis. The results suggest that risk taking contributed to the financial crisis. This paper demonstrates the need for future studies that examine corporate governance provisions and their relevance to risk taking and financial performance. The findings contribute to more effective bank regulations and risk management.

Keywords: Corporate Governance, Financial Crisis, Financial Performance, Risk Taking

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INTRODUCTION

The relationship between financial firms' corporate governance and risk taking has been explored in previous research. For example, Akhigbe and Martin (2008) have demonstrated that measures of financial firms' short- and long-term risk taking are inversely correlated with their governance structures' strength. Likewise, when Laeven and Levine (2009) examined the underlying reasons for risk taking, they found that the effects of regulations on risk taking depend on the bank's corporate governance structure.

Corporate governance is essentially a mechanism for addressing agency problems and controlling the firm's risk-taking. Thus, it is not surprising that responses to the recent financial crisis include many initiatives and statements by banking supervisory authorities and central banks that emphasize the importance of effective corporate governance in the banking sector (Peni & Vahamaa, 2011). Therefore, it is essential to assess the potential implications of enhanced corporate governance on bank performance in periods of market stress.

The purpose of this study is to explore the role that corporate governance may have played in the financial crisis of 2007-2008 by investigating the relationships among corporate governance, risk taking, and financial performance in major U.S. bank holding companies (BHCs) during the financial crisis. This study analyzes empirical evidence about the role of corporate governance in risk taking and assesses the effects of risk taking on financial performance at BHCs during the financial crisis. Specifically, data for 74 U.S. BHCs are examined to determine if financial organizations with strong governance took lower risk than organizations with weak governance and accordingly earned higher returns during the crisis. This analysis is motivated by a robust theoretical but limited empirical literature, which maintains that effective corporate governance improves firm performance by reducing managerial incentives for excessive risk-taking. Given that the recent financial turmoil is attributed by many (Grosse, 2010; Paccos, 2010; Rotheli, 2010; Scott, 2009) to excessive risk-taking, particularly in terms of real estate lending, the financial crisis of 2007-2008 provides a natural experiment for examining whether risk taking affects bank performance.

The severity of the recent financial crisis makes it essential for future public policy that the factors that led to poor financial performance at U.S. HBCs and ultimately to the crisis be clearly understood. It is also important to test these factors empirically to validate the relationships and causal factors at work. Finally, it is important for effective future public policy to understand which aspects of corporate governance had the greatest impact on risk taking and consequently on financial performance.

This study makes a number of important contributions to the existing literature about the 2007-2008 financial crisis. First, it contributes to the continuing debate on corporate governance and risk taking by providing a timely and comprehensive investigation of BHCs' corporate governance, risk taking and financial performance during the 2007-2008 financial crisis. Second, while the existing literature is limited to selected aspects of corporate governance, such as board structure and executive compensation, this study examines the effects of corporate governance on BHCs' risk-taking levels using a comprehensive corporate governance index based on 51 different governance attributes. Third, this study examines the potential role that firms' corporate governance played in the risk-taking behavior that likely contributed to the financial crisis. Finally, this study extends previous literature that examines banks' risk taking. Although prior research has queried the roles of such factors as deposit insurance and competition (Demirguc-Kunt & Detragiache, 2002; Hellmann, Murdock, & Stiglitz, 2000; and

Keeley, 1990), structure of ownership and firm regulations (Laeven & Levine, 2009), and size and franchise value (Demsetz & Strahan, 1997) on risk taking by banks, this study examines the effects of corporate governance on risk taking at banks.

The research findings also have important implications for managers and shareholders. The findings confirm whether BHCs that implemented good corporate governance had better risk management than others during the crisis, and consequently performed better. The findings also provide shareholders with the information they need about the relationship between risk taking and financial performance to direct the banks' management to avoid future similar crisis.

This paper is organized into five parts. The first part presents the literature review and discusses the existing research about the impacts of corporate governance on banks' risk-taking levels and the impacts of risk taking on financial performance. The second part details the research methodology used to address the research questions. It includes the study design, the sample, the data collection process, and the descriptive and inferential statistics that are used to verify and analyze the data. The third part presents the findings, descriptive statistics, and the results of the hypotheses testing. Part four interprets the statistical findings related to the research questions, critically evaluates the results, compares them with the literature, and discusses the implications of the study for business practice and future research on corporate governance and risk management. Finally, part five concludes the paper.

LITERATURE REVIEW

Risk management has received a lot of attention in recent literature. It appears obvious that financial firms took excessive risks to inflate stock prices, which played a major role in the crisis that emerged in 2007 (Bruner, 2011). Bruner (2011) observed that a "reduction in real risk-free rates of interest to historically low levels led to credit expansion in a ferocious search for yield among investors," which was "met by a wave of financial innovation, focused on the origination, packaging, trading, and distribution of securitized credit instruments, such as residential mortgage backed securities" (p.313). Financial firms, which sought to meet increasing demand for mortgages and to provide returns to their stockholders, extended their lending to less credit-worthy borrowers (Bruner, 2011)

Corporate governance is said to have failed when banks' risk management measures failed (Rose, 2010). Accordingly, many scholars studied whether the failure of risk management was ultimately a corporate governance failure.

The Organization for Economic Co-operation and Development (OECD) has pinpointed failures in risk management as the most important cause of the financial crisis and noted that this failure was attributed to weaknesses in corporate governance more than to defaulting risk assessment or risk models. Kirkpatrick (2009) concluded that corporate governance arrangements did not serve their purpose to safeguard against excessive risk taking when they were put to a test in a number of financial services companies. Kirkpatrick pointed to major risk management failures due to improper corporate governance procedures in main financial institutions. For example, many boards failed to ensure that approved risk management procedures were implemented, whereas others were not made aware of exposure risks at all (Kirkpatrick, 2009).

Li (2009) highlighted a strong positive correlation between risk management and corporate governance as risk management became an index to measure success of corporate governance in many countries. When corporate governance appropriately addresses risk

management, boards are forthcoming about their risk preference and strategy. Further, boards implement monitoring systems that allows them to oversee risk and respond as needed.

Of the explanations for the financial crisis of 2008, Rose (2010) considered the one that linked the crisis to excessive risk-taking most persuasive. To determine if the crisis resulted from a failure in corporate governance, he conducted empirical tests on the links between risk management and specific corporate governance factors. Rose suggested that diversified shareholders prefer risk taking more than other constituencies do. As such, further empowering shareholders will not alter their risk taking interest because they face limited downside risks. Rose concluded that risk management is an essential aspect of good corporate governance and vice versa. Risk management works hand in hand with corporate governance as a means to constrain agency costs and to promote effective management.

In his study of the financial crisis, Sahlman (2009) concluded:

It seems clear that many organizations suffered from a lethal combination of powerful, sometimes misguided incentives; inadequate control and risk management systems; misleading accounting; and, low quality human capital in terms of integrity and/or competence, all wrapped in a culture that failed to provide a sensible guide for managerial behavior. (p. 4)

The investment bank UBS was one financial firm that suffered from this lethal combination. The assessment of risk management and governance issued by UBS indicated that it suffered from powerful incentives and inadequate protocols to assess and respond to risk. While UBS had a risk management system in place, that system could not evaluate and respond to risks. The assessment stated that UBS's internal controls were not adequate, risk managers employed incomplete information and models and prioritized short-term profit over stability. Therefore, while many did acknowledge credit problems, UBS's risk managers did not appreciate the severity of the problem. The UBS case led Rose (2010) to conclude risk management systems failed in financial institutions: "The state of the art in hedging and risk management simply was not good enough, and a failure to respond to warning signs and challenge existing models and business practices clearly contributed to the collapse" (Rose, 2010, p. 7).

With this understanding, scholars concluded that the governance structures at most major financial institutions failed from a risk management perspective. Understanding such failure motivated Knott (2010) to analyze risk and decision making among firms. Knott explained that firms take two basic approaches to reduce risk. The first approach is to set risk control strategies. The second approach, used prior to the financial crisis, is to shift the risk onto other firms or to generalize the risk to the system. An example of the second approach occurs when a mortgage broker or bank sells mortgages to another bank within a few weeks of selling mortgages to individual home purchasers. This bank (buyer) will then turn the mortgage over to a third party investment firm. Another example occurs when firms seek to establish financial instruments that spread the risk among several different firms through securitization and insurance arrangements. The belief that the risk was passed on or diffused across several investment instruments incentivized brokers, lenders, and investors to take on riskier practices. Moreover, senior managers in many banks failed to fully understand the mathematical models used to spread risk, and they had limited knowledge about on-the-ground real estate markets. As such, bankers were uncertain when they were reaching a price level that was too inflated to sustain, until it was too late (Knott, 2010). This explains, in part, why managers engaged in increasingly risky behavior.

Unlike Knott (2010), Blundell-Wignall, Atkinson, and Lee (2009) argued that the securitization process was not about risk spreading; rather it was a key part of the process to increase revenue, the return on capital, and the share price. The real story, according to Blundell-Wignall et al., was that banks began to mix their traditional credit culture with an equity culture. In order for executives to capture the benefits of this business model, compensation, too, had to evolve. Bonuses based on up-front revenue generation rose relative to salary.

Lang and Jagtiani (2010) analyzed the roles that corporate governance and risk management played in events just prior to the 2008 crisis. The shocks leading to the crisis were events risk managers would have assessed, so they attributed the crisis to failures in risk management and corporate governance. In their view, most firms failed to appropriately apply fundamental risk management principles, which caused many to fail to appreciate the extent of their mortgage market exposure.

Because many of these asset-backed collateralized debt obligations (CDOs) are complex and difficult to value, Lang and Jagtiani (2010) further argued that firms struggled to measure their exposure to a particular asset and were therefore unable to analyze the correlation structure of their portfolio. Additional evidence suggests that the mortgage crisis generated a financial crisis because of the highly concentrated exposure that large financial firms had through complex structured financial products. Proponents of this perspective explain that the majority of 2007-2008 losses resulted from highly rated (AAA) structured products, particularly CDOs with high concentrations of subprime real estate exposures.

Finally, Lang and Jagtiani (2010) further argued the large BHCs had not honed the ability to determine the risks of their mortgage portfolios, which was yet another cause of the financial crisis. In fact, most BHCs lacked an internal oversight protocol to acquire and assess this risk information. Financial firms lacked effective internal controls, accurate and timely financial and risk reporting to the right management level, and a corporate wide view of risk or an enterprise-wide risk management program. Ultimately, it is the responsibility of senior management and the board of directors to see that appropriate systems are in place so that a firm can adequately understand its risk exposures. The inability to do so represents a fundamental failure of risk management and corporate controls among many of the large financial firms.

This correlation between BHC risk taking and corporate governance has been examined by previous researchers (Akhigbe and Martin, 2008; Fortin, Goldberg, and Roth, 2010; Pathan, 2009; and Peni & Vahamaa, 2011). Pathan (2009) and Fortin et al. (2010) demonstrated that BHCs with strong governance might engage in riskier measures, whereas Akhigbe and Martin (2008) and Peni and Vahamaa (2011) argued that corporate governance is inversely related to BHCs' risk behavior.

The relationship of ownership structure to risk taking was examined by several studies. Saunders, Strock, and Travlos (1990) found that owner controlled banks exhibit higher risk-taking behavior than banks controlled by managers with small shareholdings. Laeven and Levine (2009) framed their empirical analysis around three theoretical keystones. First, diversified owners tend to advocate for more bank risk taking than debt holders and non-shareholder managers. As in any limited liability firm, diversified owners have incentives to increase bank risk after collecting funds from bondholders and depositors (Esty, 1998). Second, theory predicts that regulations influence the risk taking incentives of diversified owners differently from those of debt holders and non-shareholder managers. For example, deposit insurance intensifies the ability and incentives of stockholders to increase risk (Keeley, 1990).

Third, while banking theory suggests that bank regulations affect the risk taking incentives of owners differently from those of managers, corporate governance theory suggests that ownership structure affects the ability of owners to influence risk (Jensen and Meckling, 1976). As argued by some scholars, shareholders with larger voting and cash flow rights have correspondingly greater power and incentives to shape corporate behavior than smaller owners. From this perspective, ownership structure influences the ability of owners to alter bank risks in response both to standard risk shifting incentives and to incentives created by regulations (Laeven & Levine, 2009).

Moreover, Bruner (2011) identified the trend toward “equity-based pay” as influencing firms’ risk taking: “the finance literature tends to suggest that increased alignment of bank managers’ interests with those of shareholders through equity-based pay should increase the managers’ risk appetite, and, in the presence of deposit insurance, equity gets the entire upside while avoiding much of the downside” (p. 317). In support, he cited more recent research that also indicts equity-based pay and efforts to please shareholders as important contributors to risk-taking behavior by BHCs. Bruner (2011) further demonstrated BHCs with powerful owners were more likely to take risks. Likewise, Adams (2009) implicated ownership: firms who received Troubled Asset Relief Program (TARP) funds have larger and more independent boards and offer outside directorships and greater CEO incentives (Bruner, 2011).

Another corporate governance aspect is the relationship between risk taking and CEOs incentives. While many scholars claimed that the incentive system at banks encouraged CEOs to engage in excessive risk taking that led to the crisis, Fahlenbrach and Stulz (2011) have uncovered no evidence to support such a view. Their findings support the hypothesis that the CEOs of poorly performing exposed firms thought their actions were good for themselves and shareholders (Fahlenbrach & Stulz, 2011). When Fahlenbrach and Stulz (2011) investigated the role of CEO incentives in the crisis, they determined some support for the claim that firms with CEOs’ whose interests complemented those of shareholders fared more poorly during the crisis than firms headed by CEOs who received greater option compensation and a greater percentage of cash bonus compensation.

Fahlenbrach and Stulz (2011) referenced several different explanations for the role of incentives in the crisis, such as CEOs who favored the immediate over the long term and those whose option compensation motivated more than optimal shareholder risk. They explored another explanation, which hinges on CEOs who sought volatility to increase the value of their shares. While all of these CEO incentive factors could have been at work, there is not enough evidence to clearly link CEO incentives to the financial crisis, particularly because CEO’s large equity holding could actually discourage them from engaging in risk taking behaviors.

As such, Fahlenbrach and Stulz (2011) concluded that lack of alignment between CEO incentives and shareholder interests did not, indeed, contribute to the crisis. Cross sectional sample analysis revealed that some incentivized CEOs performed worse than their less-incentivized peers. Whole-sample analysis revealed that neither stock options or cash bonuses negatively affected firm performance during the crisis period.

In a frequently referenced empirical study, Ellul and Yerramilli (2012) affirmed the belief that firm risks are reduced by strong and independent controls. When Ellul and Yerramilli (2012) examined the 74 largest publicly-listed U.S. BHCs, they concluded that those with strong risk controls preceding the crisis fared better because they were less exposed. These firms experienced less downside, tail, and aggregate risks. Specifically, these BHCs suffered less exposure to private-label mortgage-backed securities and trading assets, were less active in

trading off-balance sheet derivative securities, had a smaller fraction of non-performing loans, and had lower downside risk in 2007 and 2008.

Moreover, Ellul and Yerramilli (2012) showed that the above risks were not limited to the crisis period. When they examined the period from 2000 to 2008, they found the same relationship between downside, tail, and aggregate risk and stronger internal controls from one year to the next.

Ellul and Yerramilli's (2012) study suggested that a firm's risk taking is mediated by the strength and independence of its risk management. However, if these risks are to be successfully mediated, there must be a way for firms to identify and measure risk, which is quite difficult when multiple factors, such as credit, internal rate, and liquidity, expose firms to risk. The risks to the whole system are greater under these conditions because the failure of one firm or product can aggravate depositor panics, counter-party failures, and systemic liquidity shortages. In sum, it is difficult to measure and communicate risk in quantifiable terms because of the complex nature of today's firms (Diamond & Rajan, 2005; Ellul & Yerramilli, 2012).

EMPIRICAL STUDY

Objective and Conceptual Framework

This study explores the role that corporate governance may have played in the financial crisis of 2007-2008 by investigating the relationships among corporate governance, risk taking, and financial performance among major BHCs in the United States during the financial crisis. The study aims to empirically evaluate how corporate governance affected risk taking and how risk taking affected financial performance by exploring whether U.S. BHCs with strong governance took lower risks than organizations with weak governance and accordingly earned higher returns during the crisis.

The conceptual framework "as indicated in Figure 1 (Appendix)" consists of three primary constructs: 1) BHC corporate governance, 2) BHC risk taking, and 3) BHC financial performance. The basic argument of the research is that governance affects risk taking at BHCs and risk taking affects performance.

Research Questions and Hypotheses

This study examines the following specific questions:

Research Question 1: What is the relationship between BHCs' corporate governance and their level of risk taking?

Research Question 2: What is the relationship between BHCs' level of risk taking and their financial performance?

In response to these questions, this study tests three research hypotheses:

H1: Corporate governance of U.S. BHCs had an impact on their level of risk taking during the recent crisis.

H2a: Risk taking level of U.S. BHCs had an impact on their ROA during the recent crisis.

H2b: Risk taking level of U.S. BHCs had an impact on their ROE during the recent crisis.

Research Methodology

This study uses descriptive and inferential statistics to test the hypotheses over the four years, 2006-2009, that span the financial crisis. The sample consists of 74 BHCs with total assets near \$5.8 trillion, representing over half of U.S. banking assets. Each of these BHCs had total assets in excess of \$3 billion at the end of 2006.

Prior researchers have proposed several alternative measures of corporate governance. In this study, I apply Brown and Caylor's (2006; 2009) Corporate Governance Index (Gov-score), which utilizes 51 internal and external firm-specific factors to determine BHCs' corporate governance strength. Governance factors, such as audit, board of directors, charter/bylaws, director education, executive and director compensation, ownership, progressive practices, and state of incorporation, are coded as either 0 or 1 depending on whether the firm's corporate governance practices are at or above the minimally acceptable level. These coded values are then summed to derive the Gov-score for each firm, yielding a Gov-score range from 0 to 51, with higher values indicating stronger corporate governance. This study uses the 2005 Gov-score in its empirical analysis because prior literature demonstrates that corporate governance policy and practices change slowly. Thus, this study assumes that corporate governance mechanisms in place in 2005 affect bank performance from 2006 to 2009.

The financial performance of the banks is measured by the return on assets (ROA), calculated as the bank's total net income divided by its average total assets, and return on equity (ROE), calculated as the bank's total net income before extraordinary items divided by its average shareholders' equity.

According to an industry survey conducted by Standard and Poor's in 2000, ROA is a comprehensive measure of bank profitability. The survey also listed ROE as another important measure of profitability (Juras & Hinson, 2008). Following Juras and Hinson (2008), I use both measures because banks that rely heavily on deposits and borrowing rather than on stockholders' equity to support assets tend to have higher ROE than those that do not.

As in Chen (2011), Demircuc-Kunt and Detragiache (2002), Laeven and Levin (2009), Magalhaes, Gutierrez, and Tribu (2008), Nash and Sinkey (1997), and Spong and Sullivan (2007), among others, I measure bank risk taking by the z-score developed by Hannan and Hanweck (1988).

The z-score equals the return on assets plus the capital asset ratio divided by the standard deviation (s) of return on assets.

$$z\text{-score} = \frac{ROA + CAR}{s}$$

$CAR = E/A$ (where E is equity and A is assets)

The z-score measures distance from insolvency. It is based on the probability distribution of the income earned by the bank and is derived by asking the question: How far would income have to fall before the bank would be forced to default on its debt? Insolvency is defined as a state in which losses are greater than the bank's equity (Laeven & Levine, 2009). As explained by Spong and Sullivan (2007), z-scores represent the number of standard deviations below the mean that return on assets would have to fall to eliminate capital, and force the bank to default. The higher the z-score, the lower the bank's risk. A higher z-score indicates that the bank is more stable, and signals a lower probability of insolvency. An increase in the capital-to-asset ratio would raise the z-score, as would an increase in the operating return on assets. A decrease in the standard deviation of the return on assets would also raise the z-score, and lower a bank's risk exposure. A z-score is calculated only if there is accounting information for at least four years (Demircuc-Kunt & Detragiache, 2002; Magalhaes et al., 2008).

Population, Sample and Data Collection

A fully systematic test of BHCs' corporate governance role during the financial crisis would require analyzing structures and outcomes for all publicly traded BHCs in the United States. Such an assessment is not feasible. Therefore, this study focuses on the largest BHCs because they are markedly more important than smaller BHCs from an economic and investment perspective.

The study sample began with National Information Center (NIC) database, selecting all Top-tier (excluding atypical BHCs) BHCs classified as Peer 1 group and Peer 2 group as of December 31, 2006, which yielded 156 BHCs. The Peer 1 group includes all BHCs with \$10 billion and over in consolidated assets. The Peer 2 group includes all BHCs with consolidated assets between \$3 billion and \$10 billion. After excluding BHCs with no Gov-scores, the sample dropped to 94 BHCs. Among these 94 BHCs, 20 lacked complete financial data for 2006 - 2009 because they were acquired by another bank, changed from BHC to another entity, closed, or were foreign entities. When BHCs with incomplete information were removed, the final sample consists of 74 BHCs with 296 observations for fiscal years 2006–2009.

The study empirically analyzed data on the firms' corporate governance, risk taking, and financial performance. Georgia State University made the corporate governance data available. The financial data were obtained from the Bank Holding Company Performance Report (BHCPR), which is publicly available on a quarterly basis from the NIC. When the financial data were not available from this source, the study used annual 10-K statements from the Securities and Exchange Commission (SEC).

Data Analysis

Data analysis consisted of descriptive statistical analysis and hypothesis testing. Quantitative analysis of data involves two kinds of statistical tools: descriptive statistics and inferential statistics. Descriptive statistics in this study were generated for all constructs using the arithmetic mean, median, standard deviation, minimum, maximum, and range.

The three hypotheses in this study were tested by conducting inferential statistical tests, which consisted of simple linear regression and ANOVA tests. The statistical significance of all hypotheses was determined using a Type I error of 5 percent.

RESULTS

Descriptive Statistics

Table 1 (Appendix) provides descriptive statistics for analyzed variables. Although Gov-score may theoretically be as high as 51, the mean score is 30.81, and the median score is 31.00 with a minimum of 21 and a maximum of 40. The Gov-scores range widely, and are symmetrical with the mean and median scores nearly identical. The standard deviation for Gov-score is 4.55, thus 95% of the scores fall between 26 and 35.

BHCs profitability, as measured by ROA, varied between -3.04 % and 1.96 % during 2006 – 2009. The mean ROA is 0.42%, the median is 0.76%. BHCs profitability as measured by ROE, varied between -34.25 % and 23.00 % during the same period. The mean ROE is 3.91%, the median is 6.96%. In both cases (ROA and ROE), there is a wide variance in profits,

ranging from very unprofitable to very profitable. In both cases, medians exceed the means, indicating the profitability of the BHCs is negatively skewed. The data are thus not normally distributed, and the standard deviations are very high reflecting the great range of the data.

The mean z-score is 26.5%, the median is 15%, and the scores vary from a low of 1.46% to a high of 172.07%. The sample therefore represents a very wide range of risk taking. The mean z-score is almost twice the median, indicating that the z-scores are positively skewed, and thus that data are not normally distributed. The standard deviations are very high reflecting the great range of the scores.

Hypotheses Testing Results

Hypothesis 1 (H1): Corporate governance of U.S. BHCs had an impact on their level of risk taking during the recent crisis. Table 2 (Appendix) presents the regression analysis of z-score on Gov-score. The regression analysis tested the relationship between BHCs' corporate governance and their level of risk taking to determine if corporate governance affects risk taking. The results show that corporate governance is not a significant predictor of risk taking (Adjusted R Square = 0.004, $t = -1.08$, $P = 0.282$). The P-value is greater than the critical value of 0.05, meaning that the results are not statistically significant. Thus, the alternative hypothesis (H1) cannot be accepted.

Hypothesis 2a (H2a): Risk taking level of U.S. BHCs had an impact on their ROA during the recent crisis. Table 3 (Appendix) presents the results of regressing ROA on risk taking. The regression analysis tested the relationship between BHCs' level of risk taking and their 2006-2009 average ROA to determine if risk taking affects financial performance. The results show that risk taking is a significant predictor of financial performance (Adjusted R Square = 0.069, $t = 4.66$, $P = 0.000$). The coefficient for z-score is positive, indicating that the higher the z-score the higher the ROA. The P-value is less than the critical value of 0.05, meaning that the results are statistically significant. Thus, the alternative hypothesis can be accepted.

Hypothesis 2b (H2b): Risk taking level of U.S. BHCs had an impact on their ROE during the financial crisis. Table 4 (Appendix) presents the results of regressing ROE on risk taking. The regression analysis tested the relationship between the BHCs' level of risk taking and 2006-2009 average ROE to determine if risk taking affects financial performance. The results show that risk taking is a significant predictor of financial performance (Adjusted R Square = 0.058, $t = 4.26$, $P = 0.000$). The coefficient for z-score is positive, indicating that the higher the z-score the higher the ROE. The P-value is less than the critical value of 0.05, meaning that the results are statistically significant. Thus, the alternative hypothesis can be accepted.

DISCUSSION

Impact of Corporate Governance on Risk Taking

The study's findings that a comprehensive measure of corporate governance did not affect BHCs' risk taking during the recent crisis suggest that studies of specific provisions of corporate governance such as remuneration policies, board structure, and ownership structure (Caprio, Laeven, & Levine, 2007; Cheffins, 2009; De Andres & Vallelado, 2008; Grosse, 2010; Kirkpatrick, 2009; Sharfman, Toll, & Szydlowski, 2009; Sierra, Talmor, & Wallace, 2006; and Van Den Berghe, 2009), which concluded that corporate governance was a major cause of the

current financial crisis, failed to address the argument that the crisis resulted from a failure of the entire system of corporate governance.

Thus, studies of specific unsound corporate governance practices, or that link certain corporate governance provisions to banks' risk taking during the crisis, are not sufficient to support the claim that major governance failure was the most important cause of the crisis.

On the other hand, findings that suggest risk taking is not affected by corporate governance contradict the fundamental theory of corporate governance because boards are called upon to determine a firm's strategy and tolerance of risk. Ultimately, it is the responsibility of management and the board of directors to ensure that appropriate risk-management systems are in place. Many scholars therefore concluded that the governance structures at most major financial institutions failed from a risk management perspective.

Most of the literature that demonstrated a relationship between corporate governance and risk taking (Ellul & Yerramilli, 2012; Laeven & Levin, 2009; Lang & Jagtiani, 2010) focused on studying the relationship among risk taking and certain corporate governance provisions such as board structure and compensation structure following the famous work of Jensen and Meckling (1976) who suggested that board structure, ownership structure, and compensation structure influence the firm's conduct and performance. This study's findings call for more comprehensive research to identify and assess individual and collective banking corporate governance provisions as they affect risk taking. Understanding these provisions and their collective impact on risk taking is a necessary first step towards strengthening banking governance policy and risk management mechanisms to avoid similar future crises.

Impact of Risk Taking on Financial Performance

H2a and H2b stated that during the crisis U.S. BHCs' risk taking affected their financial performance. The regression and analysis of variance results support this hypothesis.

The results show that risk taking is a significant predictor of ROA ($P=0.000$) and ROE ($P=0.000$). The coefficients for z-score are positive, indicating that the higher the z-score the higher the ROA and ROE. Therefore, the lower the bank's risk the higher the financial performance.

This study's findings support the claim that risk affected the earnings of the BHCs during the crisis. It affirms prior studies' findings that bankers' aggressive lending tactics led to the financial crisis and that banks eagerly purchased Mortgage Backed Securities, thereby risking default for greater earnings. (Rotheli, 2010; Paccos, 2010).

The finding in this study that risks affect earnings is consistent with the fundamental risk-return theory, and the importance assigned to risk management by many scholars in this field. The finding underscores the importance of banking governance that effectively limits risk taking at BHC, while showing that the current system of banking governance, measure by Gov-score, does not significantly impact risk taking. Thus, the study's findings that risk affects performance and is not effectively controlled by current governance mechanisms make it imperative that effective governance mechanisms be designed to prevent future crises.

Implications for Governance Policy

The severity of the recent financial crisis makes understanding the factors that led to U.S. BHCs' poor financial performance and the crisis essential for future public policy. Various

observers have inferred from the recent financial crisis that the U.S. corporate governance system needs to be overhauled. This study's findings that risk taking was a factor in BHCs' financial performance during the crisis suggest that the current governance system was not effective in ensuring that proper risk-taking strategies were implemented. However, this is one of a few empirical studies of the relationships among corporate governance, risk taking and financial performance that have been conducted to date. Many more empirical studies are needed before sound recommendations for reforming the current system of banking governance can be advanced with confidence. Empirical verification, for example, is needed to examine the impact of each corporate governance provision on risk taking and financial performance.

Nevertheless, corporate governance agency theory could be modified to make managers accountable to all stakeholders and not only to the company's shareholders. De Graaf and Williams (2009) addressed the effect of such modifications on agency theory and suggested that the stakeholder perspective of a company supplements agency theory, since no one disagrees that shareholders are a stakeholder of the firm. Along the same line of De Graaf & Williams, Afrasine (2009) called for greater involvement of civil society in the risk-management decisions of the firm at international levels.

Implications for Banking Practitioners

This study also has important implications for managers and shareholders. The study's findings confirm that while banking governance did not affect risk taking, banks that nevertheless pursued sound risk-management procedures performed better than those that did not during the crisis. Thus, it seems incumbent upon bank managements and boards of directors to initiate effective risk management procedures rather than to rely upon governance policies that may not be effective.

Such initiatives might include new interpretations of existing corporate governance requirements that deal with boards' risk-oversight responsibilities to ensure that the board understand the firm's risk strategy, that is appreciates the degree to which management has created risk aware strategies, and that it compares the firm's risk tolerance to potential problems.

Moreover, there is a need to reemphasize the respective roles of the board in the risk management processes at many BHCs. Boards need to be educated on risk issues and provided the means to understand risk appetite and the banks' performance against it. While management develops appropriate procedures to identify, manage and mitigate risks, boards of directors should satisfy themselves that the risk management processes designed and implemented by management are adapted to and integrated with the board's corporate strategy and are functioning as directed, and that necessary steps are taken to foster a culture of risk-adjusted decision making throughout the organization.

Effective risk-oversight depends upon clear and timely communication between and among each firm's management and board. The board must be privy to accurate information about the firm's risk appetite and exposures as well as have access to information about how risk decisions are measured and valued. If management does not provide this information to the board, the board cannot fulfill its governance mandate to oversee risk management.

While shareholders cannot run their companies, it is important to ensure that they are aware of the risks assumed by management. This could be done by providing more and better information to shareholders.

Finally, many boards of directors delegate risk-oversight responsibilities to the audit committee. One way to enhance risk monitoring is to create external risk committees that would be responsible for identifying key risk areas, and reporting to the board of directors and the management.

Implications for Future Research

Scholars have agreed that a bubble in U.S. housing prices triggered the recent global economic crisis. However, there is little agreement as to what role corporate governance played in the financial crisis, what went wrong with governance systems, and what changes need to be made to them.

Today, many studies examine corporate governance, yet only a few papers focus on banks' corporate governance. The systematic differences found between the governance of banking and other firms highlight the point that governance structures are in fact industry-specific. Thus, banking governance reforms, in order to be effective, should take industry differences into account. This could be established through future research that examines banks' corporate governance.

Future studies should focus on more in-depth analyses of the financial statements of banks and on additional financial measures, such as write-downs, loan loss provisions, subprime losses, impairment charges, and credit losses as alternative measures of risk and performance. These measures could give direct indications of poor performance and potential indications of corporate governance practices at banks.

Much research has discussed risk management and corporate governance independently. Empirical studies that discuss the relationships between corporate governance and risk management are limited. Further empirical studies of best practices in corporate governance and risk management are needed. Future research should address each provision of corporate governance to identify specific provisions that are significantly and positively associated with firm risk taking and operating performance.

Finally, most of the literature focuses on banks and financial firms that failed during the crisis. There is thus a need for future studies of corporate governance and financial performance at firms that both succeeded and failed during the crisis. Such studies would provide broader perspective and objective, and external benchmarks for gauging the impacts of governance on banking performance.

CONCLUSION

The global economic crisis that erupted in 2008 challenges current theories of effective corporate governance. The boards of many financial firms were unable to prevent their executives from making risky decisions, and to protect the firm against the financial meltdown. Many complex and interdependent forces led to the economic crisis, and corporate governance is arguably one of them. This study contributes to understanding the relationships among corporate governance, risk taking, and financial performance at financial institutions. It explores the role that corporate governance and risk taking may have played in the financial crisis of 2007-2008 by investigating the relationships among major U.S. BHCs' corporate governance, risk taking, and financial performance during that time.

The study found no statistically significant relationship between BHCs' corporate governance and their risk taking. However, it found a significant relationship between BHCs' risk taking levels and their financial performance. BHCs with lower risk-taking levels were found to have higher average financial performance than BHCs with higher risk-taking levels from 2006 to 2009.

The study's findings support the claim that risk affected the earnings of the BHCs during the financial crisis, suggesting that risk taking, particularly aggressive risk taking, was a major factor in the 2007-2008 financial crisis. These findings are consistent with fundamental risk-return theory, and the importance assigned to risk management by many scholars in this field. The findings underscores the importance of banking governance that effectively limits risk taking at BHC, while showing that the current system of banking governance, measure by Gov-score, does not significantly impact risk taking. Thus, the study's findings that risk affects performance and is not effectively controlled by current governance mechanisms make it imperative that effective governance mechanisms be designed to prevent future crises.

To this end, this study provides a road map for thinking about the governance of financial institutions in terms of reform as well as research. It lays the foundation for further studies on corporate governance, financial performance, and risk taking at financial institutions. Further research into banks' corporate governance could lead to new insights about specific corporate governance provisions that effect risk taking and financial performance.

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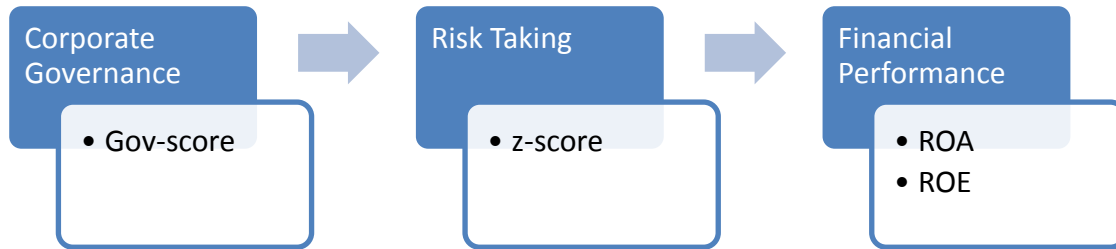
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APPENDIX

Figure 1: Conceptual Framework



Conceptual Model of the Study: The conceptual framework consists of three primary constructs: 1) BHC corporate governance as measured by Gov-score, and 2) BHC risk-taking level as measured by z-score, and financial performance as measured by ROA and ROE.

Table 1: Descriptive Statistics

Variable	N	Mean	Median	St.dev.	Min	Max	Range
Gov-score	74	30.81	31.00	4.55	21.00	40.00	19.00
ROA*	74	0.42	0.76	0.97	-3.04	1.96	5.00
ROE*	74	3.91	6.96	11.27	-34.25	23.00	57.25
z-score*	74	26.50	15.00	31.84	1.46	172.07	170.60

* Descriptive statistics were calculated as averages of 2006-2009 data.

Note. The table reports the descriptive statistics for the sample of 74 U.S. BHCs. The sample consists of 296 BHC-year observations during the period 2006-2009. Gov-score is the corporate governance measure of Brown and Caylor (2006,2009), ROA and ROE are the return on assets and return on shareholders' equity respectively (financial performance measure), and z-score is the risk-taking measure.

Table 2: Regression and ANOVA of z-score on Gov-score

Regression Statistics	
R Square	0.004
Adjusted R Square	0.001
Standard Error	31.9213
Observations	296

ANOVA (Analysis of Variance)					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	1182	1182	1.16	0.2820
Residual	294	299577	1019		
Total	295	300759			

<i>Predictor</i>	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	40.14	12.79	3.14	0.002
Gov-Score	-0.4425	0.4108	-1.08	0.2820

Table 3: Regression and ANOVA of ROA on z-score

Regression Statistics	
R Square	0.069
Adjusted R Square	0.066
Standard Error	1.6701
Observations	296

ANOVA (Analysis of Variance)					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	60.54	60.54	21.7100	0.0000
Residual	294	820.008	2.789		
Total	295	880.548			

Predictor	<i>Coefficient</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.0389	0.1262	0.31	0.758
z-score	0.014188	0.003045	4.66	0.0000 *

* p < 0.05

Table 4: Regression and ANOVA of ROE on z-score

Regression Statistics	
R Square	0.058
Adjusted R Square	0.0550
Standard Error	18.8715
Observations	296

ANOVA (Analysis of Variance)					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	6465.80	6465.800	18.1600	0.0000
Residual	294	104703.50	356.100		
Total	295	111169.30			

Predictor	<i>Coefficient</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.027	1.426	0.02	0.985
z-score	0.1466	0.03441	4.26	0.0000 *

* p < 0.05