

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 financial crisis of 2008. While the paper did not find a significant relationship between corporate governance and risk-taking level, 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.

Key words: Corporate Governance, Financial Crisis, Financial Performance, Risk Taking

INTRODUCTION

The relationship between corporate governance and risk taking in financial firms has been examined in several studies. Akhigbe and Martin (2008) demonstrated that measures of short and long-term risk taking for financial firms vary inversely with the strength of their governance structures. When Laeven and Levine (2009) examined the underlying reasons for risk taking by banks, 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 among major bank holding companies (BHCs) in the United States during the financial crisis. The study aims to evaluate empirical evidence on the effects of corporate governance on risk taking and the effects of risk taking on financial performance at BHCs during the financial crisis. In particular, data on 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; Paces, 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 highlights the role that risk management at financial institutions may have played in the risk-taking behavior that likely contributed to the financial crisis. Finally, this study contributes to the extensive literature that examines risk taking by banks. While past research has examined the impact of deposit insurance and competition (Demirguc-Kunt & Detragiache, 2002; Hellmann, Murdock, &

Stiglitz, 2000; and Keeley, 1990), ownership structure and banking 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 excessive risk-taking to boost financial firm stock prices played a major role in the financial and economic crisis emerging in 2007 (Bruner, 2010). Burner (2010) 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. This 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 (RMBS). Banks, eager to generate additional mortgages for pooling in order to meet investor demand and to please their own stockholders, substantially expanded lending to borrowers with weak credit histories.

Because risk management practices in many financial firms failed during the financial crisis, it has been said that corporate governance failed. 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. He reported that information about exposure in a number of cases did not reach the board of directors. In other cases, boards had approved risk-oversight strategies but failed to monitor their implementation.

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. Corporate governance arrangements require boards of directors

to be clear about the strategy and risk appetite of their companies. These arrangements require efficient reporting systems that allow boards to monitor their companies and to respond in a timely manner if needed. Ultimately, corporate governance makes risk management an oversight duty of the board.

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 assess the characterization of the financial crisis as a governance crisis, Rose empirically tested the strength of the links between specific corporate governance provisions (majority voting for directors elections, proxy access, and the separate of the roles of CEO and chairman of the board) and risk management. He suggested that diversified shareholders prefer risk taking more than other constituencies do. Empowering shareholders further will not change the nature of the shareholders' interest in risk taking since they are limited in their 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 of constraining agency costs and promoting efficient and prudent 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 UBS suffered from powerful incentives and inadequate control and risk management systems that could not adequately evaluate and respond to risks. The assessment stated that UBS's internal controls were not adequate, risk managers were using incomplete information and incomplete models, and UBS's culture focused on short-term profits. Nevertheless, UBS had a risk management system. Therefore, one may ask why risk managers did not anticipate the crisis. Rose (2010) suspected that although many risk managers did recognize problems in credit markets, they did not anticipate the magnitude of the problem. The UBS case led Rose (2010) to conclude that the 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, 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 role of risk management and corporate governance in the events leading up to the financial crisis. They argued that the application of fundamental principles of modern risk management would have protected financial firms from being as vulnerable to shocks in the mortgage market as they proved to be. The kinds of shocks leading to the financial crisis were well within the range of stress events that would have been considered by risk managers of these firms. Lang and Jagtiani (2010) believed that failures in risk management and corporate governance explain why large sophisticated financial firms failed to appropriately apply risk management principles to avoid the impact of the mortgage crisis, and why they did not protect themselves from this type of tail event. Further, they cite considerable evidence that many firms did not understand the quantity and nature of their exposure to the mortgage market.

The complexity of many of the asset-backed collateralized debt obligations (CDOs) markets made valuation of these instruments very difficult and uncertain. Perhaps more important, the complexity of these instruments meant that firms were not able to accurately measure their exposure to a particular asset and were therefore unable to analyze the correlation structure of their portfolio. Some 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) argued that one cause of the financial crisis was that large financial firms were willing to engage in complex mortgage-related products when they had not built the capability to analyze the portfolio risk of these activities. In most cases, no oversight function within the company demanded that kind of information and that kind of analysis. 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.

The relationship between corporate governance and risk-taking at banks has also been recently examined by Akhigbe and Martin (2008); Fortin, Goldberg, and Roth (2010); and Pathan (2009). While Akhigbe and Martin (2008) documented that risk measures of financial

firms vary inversely with the strength of corporate governance, the findings of Pathan (2009) and Fortin et al. (2010) suggested that banks with strong governance attributes might take more risk.

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 (2010) identified “equity-based pay” as an important trend affecting risk-taking in financial firms. According to him, 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. Consistent with these insights, post-crisis research has tended to confirm that equity-based pay and greater emphasis on shareholders’ interests resulted in greater risk-taking in financial firms leading up to the crisis. Bruner (2010), for example, found that banks with more powerful owners tend to take greater risks. Adams (2009) similarly found that banks that received funds from the U.S. government under the Troubled Asset Relief Program (TARP) have more independent boards, larger boards, more outside directorships, and greater incentive pay for CEOs. Beltratti and Stulz (2009) likewise found that banks with more pro-shareholder boards performed worse during the crisis.

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 are consistent with the hypothesis that CEOs who took exposures that performed poorly during the crisis did so because they thought that doing so was good for both shareholders and themselves. Fahlenbrach and Stulz (2011) investigated whether bank performance during the recent crisis is related to CEO incentives before the crisis. They found some evidence that banks with CEOs whose incentives were better aligned with the interests of shareholders performed worse whereas banks with higher option compensation and a larger fraction of compensation in cash bonuses for their CEOs did not perform worse during the crisis. Bank CEOs did not reduce their holdings of shares in anticipation of the crisis or during the crisis. Consequently, they suffered extremely large wealth losses in the wake of the crisis.

According to Fahlenbrach and Stulz (2011), there are many versions of the poor incentives explanation of the crisis. One version is that CEOs had strong incentives to focus on the short run instead of the long run. Another version is that option compensation encouraged CEOs to take more risks than would have been optimal for shareholders. A third version is that the high leverage of financial institutions implies that CEOs can increase the value of their shares by increasing the volatility of the assets because the shares are effectively options on the value of the assets. Though the incentives of CEOs can be such that they focus too much on the short run, that they take too much risk, and that they choose excessive leverage, it is by no means obvious that CEO incentives in banks had these implications. In particular, large holdings of equity by CEOs could in fact lead them to focus appropriately on the long run, to avoid some risks that might be profitable for shareholders, and to avoid excessive leverage.

Therefore, Fahlenbrach and Stulz (2011) concluded that lack of alignment of bank CEO incentives with shareholder interests cannot be blamed for the credit crisis or for the performance of banks during that crisis. When Fahlenbrach and Stulz (2011) attempted to explain the performance of banks in the cross section, they found evidence that banks where CEOs had better incentives in terms of the dollar value of their stake performed significantly worse than banks where CEOs had poorer incentives. For the whole sample studied by Fahlenbrach and Stulz (2011), neither cash bonus nor stock options had an adverse impact on bank performance during the crisis.

In a well-known empirical study, Ellul and Yerramilli (2010) supported the idea that strong and independent risk controls lower enterprise-wide risk in banking institutions. Ellul and Yerramilli (2010) examined the organizational structure of the risk management function at the 74 largest publicly-listed BHCs in the United States and concluded that BHCs with strong risk management functions in place before the onset of the financial crisis were more careful in their exposure to risky financial instruments and generally fared better during the crisis period. These banks had lower downside risk, lower tail risk, and lower aggregate risk. Specifically, these BHCs had lower 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 during 2007 and 2008.

Moreover, Ellul and Yerramilli (2010) showed that the relationship between the strength of internal risk controls and enterprise-wide risk is not just confined to the crisis period but also holds true more generally during normal times. Examining a panel spanning the nine year period from 2000 to 2008, they find that BHCs with stronger internal risk controls in the previous year have lower downside risk, lower tail risk, and lower aggregate risk in the current year.

Ellul and Yerramilli's (2010) study suggested that the presence of a strong and independent risk management function is one mechanism that can check the risk-taking tendencies of bank executives and traders. However, for risks to be successfully managed, they must first be identified and measured. This is particularly challenging for banking institutions given the multitude of risks to which they are exposed. Apart from credit risk, banks are also exposed to interest rate risk and liquidity risk given that they finance illiquid assets with liquid liabilities such as deposits (Diamond & Rajan, 2005). Trading and underwriting activities of their subsidiaries not only increase the risk exposures of individual banks but also increase the risk of broad systemic failure because the failure of one segment of a large institution can trigger a broader systemic failure through depositor panics, counter-party failures, and systemic liquidity shortages (Diamond & Rajan, 2005).

In sum, the increasing complexity of today's banking institutions makes it difficult to measure risk and to communicate risk objectives to business segments in easily quantifiable terms.

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 evaluate empirical evidence on the effects of corporate governance on risk taking and the effects of risk taking on financial performance at BHCs during the financial crisis. In particular, data on 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.

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 at the end of 2006. These large BHCs account for a substantial proportion (52%) of the total amount of banking assets in the United States. 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) to measure the strength of BHCs' corporate governance. The Gov-score index is based on 51 firm-specific factors that measure internal and external firm governance. The governance factors 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. Thus, the Gov-score may range from 0 to 51, with the higher values corresponding to stronger corporate governance practices. The different governance sectors in the Gov-score include audit, board of directors, charter/bylaws, director education, executive and director compensation, ownership, progressive practices, and state of incorporation. Because the prior literature suggests that corporate governance structures change slowly and the effects of governance practices occur with a significant lag, this study uses the 2005 Gov-score for empirical analysis. 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 used the National Information Center (NIC) database as the starting point for the sample. The study selected 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. After eliminating the BHCs with insufficient financial information, the final sample consists of 74 BHCs with 296 observations for fiscal years 2006–2009.

The empirical analysis requires data on the BHCs' (i) corporate governance, (ii) risk taking, and (iii) financial performance. The corporate governance data used in the analysis are obtained from Georgia State University; whereas the financial data are obtained from the Bank Holding Company Performance Report (BHCPR), which is publicly available on a quarterly basis from the NIC. When the data were not available from this source, the study used annual 10-K statements filed with 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) reports the descriptive statistics for the variables used in the analysis. 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, the study's findings that corporate governance does not affect risk taking contradicts the fundamental theory of corporate governance, which makes risk management an oversight duty of the board of directors, and that requires boards to be clear about the strategy and risk appetite of their companies. 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, 2010; 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 U.S. BHCs' risk taking had an impact on their financial performance during the recent crisis. 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 financial crisis. This finding is consistent with studies that find that aggressive lending tactics by bankers led to the financial crisis, and that concluded that risk was underestimated at financial institutions eager to fund the subprime mortgage business by purchasing Mortgage Backed Securities that offered great earnings relative to default risk (Rotheli, 2010; Paces, 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 understands the entity's risk philosophy, knows the extent to which management has established effective enterprise risk management strategies, compares the portfolio of risk with the entity's risk appetite, and determines whether management is responding appropriately to any identified 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.

Direct and timely communications among board members, board committees, and management is one of the most important elements in effective risk-oversight management. Management must communicate to the boards sufficient information to enable them to understand the company's risk profile, the specific material risk exposures affecting the company's current and future operations, how risks are assessed and prioritized by the

management team, risk response strategies, implementation of risk management procedures and infrastructure, and the strength and weaknesses of the overall risk-management system.

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 corporate governance, risk taking, and financial performance for major bank holding companies (BHCs) in the United States during the recent financial crisis.

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. The results suggest that risk taking contributed to the 2007-2008 financial crisis, and that aggressive risk taking was an important contributor to the recent 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 underscore 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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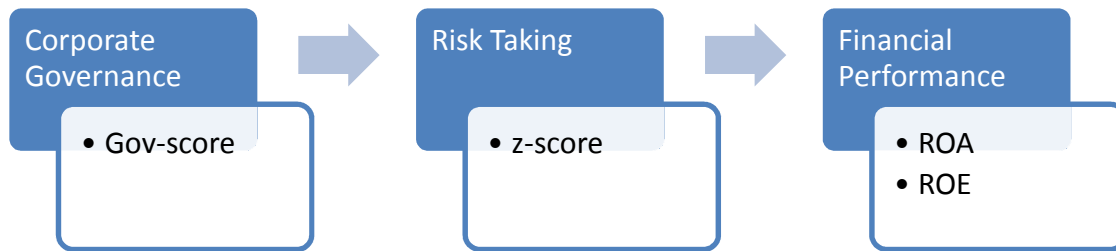
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APPENDIX

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)					
	df	SS	MS	F	Significance F
Regression	1	1182	1182	1.16	0.2820
Residual	294	299577	1019		
Total	295	300759			

Predictor	Coefficients	Standard Error	t Stat	P-value
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>Coefficients</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