

## Bank charter value determinants during the 2008 financial crisis

Rich Fortin  
New Mexico State University

Gerson M. Goldberg  
University of Connecticut

Greg Roth  
New Mexico State University

### ABSTRACT

Using a sample of large U.S. bank holding companies (BHCs), this study estimates the determinants of their charter values at the height of the 2008 financial crisis. These results are compared to estimates of BHC charter value determinants shortly before the financial crisis, in 2006. Among other variables, the potential influences of bank size, equity capitalization, corporate governance, CEO compensation components, and ownership structure are analyzed. Some variables exhibit relatively consistent influences over time, whereas other variables do not. The study's findings are interpreted in a public policy context. Overall, the evidence offers both good and bad news for bank regulators.

Keywords: banks, corporate governance, CEO compensation, government policy, and regulation

## INTRODUCTION

In the middle of 2007 a long building credit boom peaked in the U.S. The collapse of this massive credit expansion triggered a global financial crisis, a crisis that arguably peaked in 2008 during the weeks following the September 15<sup>th</sup> bankruptcy filing of Lehman Brothers Holdings, Inc.<sup>1</sup> Throughout the crisis U.S. banks were under enormous and unusual stress.<sup>2</sup> The crisis eventually forced the Federal Deposit Insurance Corporation (FDIC) to close down dozens of U.S. banks at a cost of many billions of dollars.<sup>3</sup>

This study analyzes factors that potentially influenced bank charter values before and during the 2008 financial crisis. The research goals are twofold. First, the study observes how bank shareholders' perceptions of value evolved (or did not evolve) during the crisis. Second, the study interprets the importance of bank shareholder perceptions of value in a broader, public policy context.

Using a sample of 76 large banks, the study estimates the influence of various factors on a measure of bank charter value, the price-book ratio. As a market-based measure, the price-book ratio reflects bank shareholder perceptions of equity value at a specific point in time. The study also analyzes perceptions of bank value in an agency context. Accordingly, the study develops a model with multiple explanatory variables related to potential shareholder-management conflict. Although the sample is small in absolute number, on a value-weighted basis it captures about two-thirds of the entire federally-insured commercial banking industry. The sampled bank holding companies controlled only 3.1% of all FDIC-insured commercial banks operating in 2007. However, these large commercial banks held about 65% of all FDIC-insured commercial bank assets.

The results from this study suggest that shareholder attitudes regarding some forms of CEO compensation evolved from the credit boom period to the financial crisis period. Bank CEO salaries were unrelated to charter values in 2006, but negatively related to charter values in 2008. CEO option grants were positively related to charter values in 2006, but unrelated to charter values in 2008. These findings suggest that high CEO salaries and high CEO option grants were viewed less favorably by bank shareholders after the onset of the financial crisis. From a public policy perspective, regulators and taxpayers might take some comfort in the thought that shareholders no longer strongly preferred for their bank managers to be paid in options, i.e., derivatives that increase in value with underlying asset risk. However, shareholders' new preference for low CEO salaries might not be welcome news for regulators. High CEO salaries likely diminish managerial risk-taking incentives, so the net effect of shareholders' changing preferences is unclear.

Results concerning corporate governance, share ownership, bank size, and capital adequacy are fairly consistent across the sample periods. Using a measure of corporate governance popularized in earlier studies, this study finds that better corporate governance is

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<sup>1</sup> Ivashina and Scharfstein (2010) describe this credit boom and they analyze factors contributing to the liquidity crisis in late 2008.

<sup>2</sup> The firms analyzed in this study consist of U.S. bank holding companies, but in the paper the terms "bank holding companies," "BHCs," and "banks" are used interchangeably.

<sup>3</sup> According to the FDIC website (accessed 8/9/2011), during the two-year period 2007-2008 there were only 28 FDIC-insured bank closings. By contrast, during 2009-2010 there were 297 FDIC-insured bank closings. Grocer (2011) reports that the estimated cost to the FDIC's fund for bank closings in 2010 alone is over \$24 billion.

associated with higher charter values in both periods. Share ownership by inside directors and share ownership by outsider blockholders are unrelated to charter values in both years. In contrast, bank size has a strong, negative influence on charter values in both years. This finding likely reflects several factors, including: (a) the greater complexity and risk of operations (e.g., trading activities, use of financial derivatives and off balance sheet activities) associated with larger banks, which makes them more difficult to value; (b) the lower growth prospects associated with larger banks; and (c) the greater regulatory scrutiny associated with larger banks. Nonetheless, the negative relationship between bank size and charter value may surprise some who believe that large banks are deemed “too big to fail” and that these banks benefit greatly in the market from an implicit federal government backstop. Surprisingly, capital adequacy is negatively related to charter values before and during the financial crisis. This result might be disturbing to both regulators and taxpayers, because it suggests bank shareholders benefit so much from explicit and implicit government guarantees that they prefer for bank managers to choose riskier capital structures. This finding adds to the evidence that bank shareholders and U.S. taxpayers sometimes have very different incentives.

Additional results suggest that lagged stock returns are positively related to charter values during the financial crisis; however, lagged bank accounting return on equity (ROE) is only positively related to charter values in the pre-crisis period. The finding that ROE lost influence in 2008 suggests that shareholders perceived banks’ publicly reported accounting returns as less informative during the financial crisis. From a policy perspective, this evidence supports the view held by some critics that severe weaknesses exist in the accounting for banking assets and income. Finally, this study observes that the shareholdings of bank insiders increased significantly from the pre-crisis to the crisis period. This evidence indicates that bank insiders did not foresee the severity of the 2008 financial crisis and the approaching wealth destruction that would come from owning their own banks’ shares.

## EARLIER LITERATURE

There is no prior research, to this study’s authors’ knowledge, that examines bank charter value determinants during the 2008 financial crisis. However, a number of studies investigate the determinants of bank charter values during earlier periods. For example, Houston and James (1995) focus on the role that bank executive compensation plays in affecting both bank charter values and bank risk. They find a positive relation between bank executives’ equity-based compensation and bank charter values. Houston and James (1995) interpret this result as supporting the view that bank executive compensation is not designed to encourage excessive bank risk-taking.<sup>4</sup> De Nicolò (2001) analyzes bank charter values with an international data set that includes BHCs from 21 industrialized nations. His evidence indicates that bank size is negatively related to charter values in most countries. De Nicolò (2001) concludes that larger banks take greater risks, which reduces charter values. This risk effect dominates any diversification benefits or economies of scale advantages that larger banks might have.

De Nicolò’s (2001) suggestion that costs associated with bank risk-taking may decrease charter values is contrasted by Saunders and Wilson (2001) who provide evidence that bank risk-taking creates higher charter value. They propose that charter values reflect growth opportunities, which increase during business cycle upswings. Increasing charter values, in turn,

<sup>4</sup> Other researchers examine the relationship between equity ownership structure and bank charter value. See, for example, Palia and Porter (2004) and Caprio, Laeven and Levine (2007).

allow banks greater access to equity capital which further promotes bank expansion. Saunders and Wilson (2001) contend that there will be a positive relation between charter values and equity capital during economic expansions, but that this relation will likely reverse during economic contractions. Their regression evidence indicates that the relationship between capital adequacy (or financial leverage) and bank charter value changes with the economic environment.

Saunders and Wilson's (2001) evidence that charter value influences change over time with market conditions is strongly supported by Furlong and Kwan (2005). Using a sample of large U.S. banks, Furlong and Kwan (2005) find that, in general, consumer lending is positively related to charter value, but commercial lending and real estate lending are negatively related to charter value. Furlong and Kwan (2005) observe that the influences of these variables (and others) on charter values change significantly over time with the banking industry's operating environment. Palia and Porter (2004) also argue that the influences on bank charter value change over time.

As noted earlier, the authors of this study are aware of no research that examines bank charter value determinants during the 2008 financial crisis. However, Ivashina and Scharfstein (2010) analyze how bank lending changed from the height of the credit boom (in the second quarter of 2007) to the height of the financial crisis (in the fourth quarter of 2008, after the bankruptcy filing of Lehman Brothers). They find that new bank lending to large customers fell by 79% compared to the height of the lending boom. Ivashina and Scharfstein (2010) also find that, at the height of the crisis, banks' short term creditors quickly withdrew funds while existing bank borrowers quickly drew down their lines of credit. This deposit insurance era run on banks occurred because of concern regarding the liquidity and solvency of U.S. banks. Of course the actions of these creditors and borrowers served to add liquidity stress on banks, hindering their ability to make new loans to new borrowers. Clearly, the banking industry's operating environment had deteriorated significantly from the boom years to the fourth quarter of 2008.

## DATA AND REGRESSION MODEL

This study estimates the influence of various factors on bank charter values for the years 2006 and 2008. For both the pre-crisis year (2006) and the financial crisis year (2008) the dependent variable is the bank's price-book ratio.<sup>5</sup> The potential determinants of bank value are analyzed in an agency context, so the right hand side of the model includes several variables that are designed to capture shareholder-management conflict. These conflict variables include a corporate governance measure, CEO compensation measures, and share ownership measures. To capture potentially conflicting interests between bank shareholders and regulators (or bank shareholders and taxpayers), the model includes variables (relating to bank leverage and CEO risk-taking incentives) that proxy for those conflicts.

The explanatory variables for both sample years are: SIZE (the natural log of total assets); RETURN (unadjusted one year share return); ROE (the accounting return on equity); CAPITAL (equity divided by assets); MANAGER (a corporate governance index that increases in value for manager-controlled firms); SALARY (the dollar value of CEO annual salary, scaled by SIZE); OPTIONS (the dollar value of CEO annual option grants, scaled by SIZE); BONUS (the dollar value of CEO annual bonus, scaled by SIZE); INSIDE (the percentage of shares held by board insiders); and OUTSIDE (the percentage of shares held by outsiders who individually

<sup>5</sup> Prior bank studies that use the price-book ratio as a proxy variable for charter values include Furlong and Kwan (2005) and Caprio, Laeven and Levine (2007).

own at least 5% of bank shares). Price-book ratios are regressed on one-year lagged values of these explanatory variables. For the pre-crisis year, the price-book ratio is measured at the end of 2006 and the explanatory variables are measured for the year 2005. For the crisis year, the price-book ratio is measured at the end of 2008 and the explanatory variables are generally measured for the year 2007. The one exception to this design occurs with the variable MANAGER. As explained later, the most recent measurements available for this variable were made in 2005, so these values are used in both the pre-crisis year regressions and the crisis year regressions.

Share return data and accounting data are gathered from Compustat. Share ownership data and CEO compensation data are gathered from proxy statements appearing on the U.S. Securities and Exchange Commission's web site.<sup>6</sup>

The initial sample of banks is drawn from Andrew Metrick's web site at the Yale School of Management.<sup>7</sup> Gompers, Ishii and Metrick (2003) develop a corporate governance index that summarizes data on 24 different corporate governance characteristics. For each firm's governance characteristic a condition is either met or not met. The ranking system used by Gompers, et al (2003) adds 1 to the index value for each met condition that increases managerial power (and so necessarily decreases shareholder power). Firms with lower rankings have corporate governance characteristics that are overall more shareholder-friendly. In practice, the integer index value for all firms included in Professor Metrick's data set ranges from 1 to 19. To analyze whether shareholder-management conflicts influence bank charter values, this study uses Professor Metrick's data set as a starting point. Several prior studies have also used these corporate governance data.<sup>8</sup>

The most recent index data available on Professor Metrick's web site at the time of this study was for January, 2006 (measuring corporate governance at the end of 2005). Therefore, the study uses these index values with both the pre-crisis (2006) charter values and the financial crisis (2008) charter values. Using these index values for both years is unlikely to bias the results. Gompers, et al (2003) point out that their corporate governance index values are stable over time. Therefore, it is doubtful that these overall measures of managerial power would change much in just two years. Finally, and as shown later, the coefficient on the variable MANAGER has the same sign in both years and is statistically significant in both years.<sup>9</sup>

Professor Metrick's data set for 2005 includes 1,896 large firms, of which 97 are large bank holding companies. After eliminating those banks that lack complete information on the

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<sup>6</sup> The dollar value of annual CEO option grants for 2005 and 2007 is estimated using the Black-Scholes (1973) option pricing formula as modified by Merton (1973). Maturity matching Treasury Constant Maturity Rates for 2005 and 2007 are drawn from the Federal Reserve's web site and used as the "risk free rates." End of year stock prices and dividend yields for both years are drawn from Compustat.

<sup>7</sup> To view Professor Metrick's data see: <http://faculty.som.yale.edu/andrewmetrick/data.html>

<sup>8</sup> See, for example, Klock, Mansi and Maxwell (2005), Core, Guay and Rusticus (2006), Dittman and Mahrt-Smith (2007), and Hwang and Kim (2009).

<sup>9</sup> Another reason for including the Gompers, et al (2003) corporate governance index in this study's regression models is that the index measures governance characteristics that are not directly related to the study's other measures of shareholder-manager conflict, which are based on share ownership or CEO compensation. For a more detailed discussion of the 24 factors included in the index and how those data are gathered, see Gompers, et al (2003).

variables above, the final sample consists of 76 large, U.S. bank holding companies that each holds FDIC-insured commercial banks. Even though these 76 BHCs hold only about 3.1% of all FDIC-insured commercial banks, the sampled commercial banks are very large, holding about 65% of all FDIC-insured commercial bank assets. Thus on a value-weighted basis, the sample used in this study captures about two-thirds of the FDIC-insured commercial banking industry.<sup>10</sup>

## RESULTS

Table 1 shows descriptive statistics for 76 sampled banks in the pre-crisis period and in the crisis period. Table 1 also shows the results of (two-tailed) difference in means t-tests. Not surprisingly, estimated bank charter values fell dramatically from the pre-crisis period to the crisis period. The mean price-book ratio went from 2.12 to 1.20, a 43% decline that is statistically significant at the 1% level. A number of other statistically significant changes are reported in Table 1. For example, the equity to assets ratio (CAPITAL) rose from .090 to .095. ROE fell from 14.1% to 9.7%. The mean share return for sampled banks was -2.96% in 2005 and -23.55% in 2007.

Perhaps the most surprising result in Table 1 relates to share ownership by insiders. Insiders increased their holdings from 5.35% of bank shares in 2005 to 7.83% of bank shares in 2007. This increase in share ownership, statistically significant at the 1% level, suggests that bank insiders did not have advanced warning of the coming crisis. As noted above, if bank insiders had sold their shares at the beginning of 2007, they would have avoided (on average) a 23.55% loss in that year alone. The mean ownership by outside blockholders did not change significantly from the pre-crisis period to the crisis period.

The results regarding CEO compensation variables were not particularly surprising. Consistent with the idea that CEO salary is a stable source of income, the mean CEO salary rose from \$674,767 in 2005 to \$704,722 in 2007, however this fairly small change is not statistically significant. Consistent with the idea that CEO options and CEO bonuses are more closely tied with bank performance, both of these income sources fell dramatically from 2005 to 2007. The mean value of annual CEO option grants fell from about \$1.35 million to \$350,000. The mean value of annual CEO bonuses fell from about \$1.12 million to \$360,000. The difference in means for both OPTIONS and BONUS are significant at the 1% level.

Regression results are shown in Table 2. The dependent variable is the 2006 price-book ratio (for the pre-crisis period) and the 2008 price-book ratio (for the crisis period). Explanatory variables are lagged by one year for both the pre-crisis period and the crisis period (except, as noted, for the variable MANAGER in the crisis period). Two different model specifications (Models 1 and 2) are estimated for each period. Model 1 includes the market and accounting variables as well as the corporate governance index, MANAGER. Model 2 adds to these explanatory variables the CEO compensation variables and the ownership structure variables. As shown in Table 2, SIZE is consistently, negatively related to bank charter value (at the 0.05 level or better) in the pre-crisis and crisis periods. Any positive effect on bank charter value from being perceived as “too big to fail” is dominated by the negative valuation effects associated with larger banks. RETURN is positively related to charter value in the pre-crisis period (at the 0.10 level) and in the crisis period (at the 0.01 level). The size of the coefficient on RETURN is also greater in the crisis period. In contrast, ROE is positively related to charter

<sup>10</sup> The percentage of all FDIC-insured commercial bank assets included in this study's sample is estimated using data from FFIEC call reports and FDIC Statistics on Depository Institutions.

value in the pre-crisis period (at the 0.01 level), but ROE is statistically unrelated to charter value in the crisis period. The coefficient on ROE is also much greater in the pre-crisis period than in the crisis period. This evidence suggests that the influence of accounting returns on price-book ratios weakened from the pre-crisis to the crisis period, while the influence of recent share returns did not weaken. These findings suggest that shareholders lost faith in the accounting representation of returns during the crisis period.

Surprisingly, CAPITAL is negatively related to charter value in the pre-crisis and crisis periods (at the 0.01 level or better). Although it is not surprising that shareholders might place a higher value on banks with greater financial leverage during a period of economic expansion, in 2006, it is astonishing that shareholders prefer banks with higher leverage at the height of a banking crisis and during a recession, in 2008. Earlier evidence had led the authors of this study to expect a different result. For example, Palia and Porter (2004) analyze the influence of bank capital structure on U.S. bank charter value for the year 1991, a year that followed a Savings and Loan crisis and that included a U.S. recession. They find that banks with higher financial leverage have lower charter values. Another variable that exhibits a consistently negative influence on charter value is MANAGER. MANAGER is negatively related to charter value in the pre-crisis and crisis periods (at the 0.10 level or better). This finding confirms that banks with corporate governance structures offering greater shareholder rights (and fewer managerial rights) are valued more highly by shareholders.

The two most interesting findings regarding bank CEO compensation relate to SALARY and OPTIONS. In the pre-crisis period, SALARY has no statistically reliable influence on bank charter value. By contrast, SALARY exhibits a negative influence on charter value (at the 0.01 level) in the crisis period. The variable OPTIONS is positively related to charter value (at the 0.10 level) in the pre-crisis period. However, OPTIONS is unrelated to charter value in the crisis period. The findings can be interpreted as follows. Shareholders were unconcerned about high CEO salaries when times were good, but they associated high CEO salaries with managerial conflicts of interest when times were bad. Shareholders likely viewed CEO option grants as providing a trade off. On the one hand, options help overcome excessive managerial risk-aversion, which can increase shareholder wealth. On the other hand, options can encourage recklessly high levels of managerial risk-taking, which decreases shareholder wealth. In the pre-crisis period shareholders emphasized the positive effects of options. In the crisis period shareholders focused more equally on the positive and negative effects of options. The remaining variables considered are BONUS, INSIDE, and OUTSIDE. None of these variables is significantly related to charter value in the pre-crisis or crisis period.

## DISCUSSION

Earlier researchers (see, e.g., Merton, 1977, and Keeley, 1990) discuss how deposit insurance and implicit federal guarantees of certain bank liabilities may create incentives for excessive risk-taking by bank managers. U.S. federal agencies and regulators are responsible for monitoring bank risk and they have historically been viewed as having an adversarial relationship with banks. This relationship was likely strained further by recent bank failures and “bailouts” in the aftermath of the 2008 financial crisis. For example, in responding to bankers’ claims that they did not lend more money following the 2008 financial crisis because of uncertainty surrounding evolving banking regulations, Treasury Secretary Timothy Geithner said:

Don't listen to banks about this kind of question because their interests are not aligned perfectly with the broad interests of the American economy. Their job is to evade, or avoid, or weaken, any constraints on their ability to operate. Our job is to try to make sure we're protecting the American economy from the risks they inevitably take.<sup>11</sup>

Thomas Hoenig, President of the Federal Reserve Bank of Kansas City, had the following response to concerns by bankers that they would have to raise new equity capital under Dodd-Frank and Basel III:

They're concerned about their return on equity, and I'm concerned about the safety of the banking system and the American depositor and taxpayer. All the safety net has done is allowed them to leverage up to their advantage on the backs of the American taxpayer. I have a hard time as a person, who is more concerned about the safety of the system and the taxpayer, to worry about their position.<sup>12</sup>

Because the incentives of bankers may well differ from those of regulators, this section briefly discusses the implications of this study's results for public policymakers.

Bank managers and directors are assumed to be at least somewhat responsive to the wishes of their shareholders. Accordingly, it is reasonable to expect that bank management generally will favor strategies that increase bank charter values. The findings from this study that are most applicable to public policy relate to bank size, equity capitalization, and CEO compensation.

Regulators, taxpayers, community bankers and others have often expressed alarm at the increasing concentration of the U.S. banking industry.<sup>13</sup> The potential for moral hazard created by this concentration has led many observers to conclude that some banks may be "too big to fail" and that this poses a significant threat to the stability of the U.S. financial system.<sup>14</sup> Thomas Hoenig recently stated that, "The greatest threat to the banking system is concentration in banking in this country."<sup>15</sup> The evidence from this study (that larger banks have lower charter values before and during the financial crisis) suggests that bank shareholders do not experience a net benefit from increased bank size.<sup>16</sup> It is therefore unlikely that shareholders are pressuring bank managers to increase size. Poor corporate governance might explain increasing bank concentration. However, using pre-crisis or crisis data, there is no significant correlation

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<sup>11</sup> See Katz (2011).

<sup>12</sup> See Borak (2011).

<sup>13</sup> As noted above, this study's sample reflects high industry concentration. The sampled banks controlled only 3.1% of all FDIC-insured commercial banks in 2007; however, they controlled about 65% of all FDIC-insured commercial bank assets. For a criticism of banking concentration, see Wilmer (2011).

<sup>14</sup> For a more detailed discussion of potential benefits to banks that are considered "too big to fail", see Stern and Feldman (2004).

<sup>15</sup> See Borak (2011).

<sup>16</sup> This study also finds evidence that larger banks lost a greater percentage of value during the 2008 financial crisis. In a regression of the percentage change in price-book ratios from the pre-crisis period to the crisis period (the results of which are not shown in tabular form) the only explanatory variable from Table 2 that has significant influence is SIZE. Larger banks, where SIZE is measured in the pre-crisis period, lost a significantly greater percentage of their charter values during the crisis period ( $p = 0.051$ ).



between the variables MANAGER and SIZE, which indicates that larger banks do not suffer from obviously worse corporate governance. One variable that is significantly correlated with SIZE ( $p=0.067$  in the pre-crisis period and  $p=0.014$  in the crisis period) is OPTIONS. Relative to smaller banks, larger banks more often engage in many riskier, non-traditional banking activities (e.g., speculative trading in various financial instruments). Thus bank CEOs who are paid more heavily in options may also pursue greater size and riskier operations.

Another fear among policymakers is that undercapitalized banks: (a) have stronger incentives to take risk; (b) are more likely to fail; and (c) inflict greater costs on taxpayers when they do fail. This study's finding that charter values are greater for more highly leveraged banks in both the pre-crisis and crisis periods suggests that shareholders indeed consistently prefer banks that have weaker equity capitalization. Corroborating evidence can be found in the negative correlation between the variable OUTSIDE and CAPITAL (significant at  $p=0.066$ ). This negative correlation suggests that when outsider share ownership is more highly concentrated, so those shareholders have more power, banks have lower equity capital. This evidence supports the view that bank shareholders are likely to pressure managers to pursue high financial leverage. The evidence is also consistent with White (2011) and others who argue that bank shareholders prefer a degree of financial leverage that appears excessively risky to others, so improved alignment of interests between bank managers and shareholders would likely not have prevented (or decreased the severity of) the 2008 financial crisis.

Finally, the evidence from this study regarding the changing influences of OPTIONS and SALARY would likely be received as mixed news to bank regulators. All else equal, regulators are likely to prefer that bank CEOs be paid more in base salary than in stock option grants. Base salary is a fixed income claim that gives CEOs incentives similar to those of senior bondholders. As the CEO's fixed income stream from the bank increases, his/her incentive to put bank assets at risk decreases. Alternatively, stock options increase in value as the variance of underlying share returns increases. As the CEO's compensation from bank stock options increases, CEO incentives to take greater bank risk also increases. Charter value is found to be negatively related to SALARY, but only in the crisis period. Charter value is positively related to OPTIONS, but only in the pre-crisis period. From the regulator's perspective, bank shareholders' preferences regarding CEO compensation served to both increase potential bank risk (in the case of salary) and decrease potential bank risk (in the case of stock options) during the 2008 financial crisis.

## **SUMMARY**

This study focuses on (a) analyzing the determinants of bank charter values in the periods before and during the 2008 financial crisis; and (b) interpreting this evidence from the bank regulator's point of view. Bank size and equity capitalization are found to be negatively related to charter values in both the pre-crisis and crisis periods. Charter values are positively related to bank CEO options, but only in the pre-crisis period. Charter values are negatively related to CEO salaries, but only in the crisis period. Shareholders consistently assign higher valuations to banks with more shareholder-friendly corporate governance. These results offer both encouraging and disturbing news for regulators. Additional evidence suggests that investors lost faith in the accounting representation of earnings during the financial crisis. Finally, this study observes that bank inside directors' shareholdings increased significantly from the pre-crisis to the crisis period, indicating that bank insiders did not accurately forecast the coming wealth destruction from owning their own banks' shares.

## REFERENCES

- Black, F., and M. Scholes, 1973. The pricing of options and corporate liabilities, *Journal of Political Economy* 81, 637–54.
- Borak, D. Fed's Hoenig on the failure to end bailouts, and why another crisis is coming. *American Banker*, June 6, 2011.  
[http://www.americanbanker.com/issues/176\\_108/hoenig-basel-tbtf-future-1038513-1.html?zkPrintable=true](http://www.americanbanker.com/issues/176_108/hoenig-basel-tbtf-future-1038513-1.html?zkPrintable=true)
- Caprio, G., L. Laeven, and R. Levine, 2007. Governance and bank valuation, *Journal of Financial Intermediation* 16, 584–617.
- Core, J.E., W.R. Guay, and T.O. Rusticus, 2006. Does weak governance cause weak stock returns? An examination of firm operating performance and investors' expectations, *Journal of Finance* 61, 655–87.
- De Nicoló, G., 2001. Size, charter value, and risk in banking: an international perspective, Unpublished Working Paper, International Monetary Fund, Washington, DC.
- Dittmar, A. and J. Mahrt-Smith, 2007. Corporate governance and the value of cash holdings, *Journal of Financial Economics* 83, 599–634.
- Federal Deposit Insurance Corporation:  
<http://www.fdic.gov/bank/individual/failed/banklist.html>
- Furlong, F. and S. Kwan, 2005. Market-to-book, charter value, and bank risk-taking – a recent perspective, Unpublished Working Paper, Federal Reserve Bank, San Francisco, CA.
- Gompers, P., J. Ishii, and A. Metrick, 2003. Corporate governance and equity prices, *Quarterly Journal of Economics* 118, 107–55.
- Grocer, S., The cost of bank failures keeps rising. *The Wall Street Journal*, May 13, 2011.  
<http://blogs.wsj.com/deals/2011/05/13/the-cost-of-bank-failures-keeps-rising/>.
- Houston, J. and C. James, 1995. CEO compensation and bank risk, is compensation in banking structured to promote risk taking? *Journal of Monetary Economics* 36, 405–31.
- Hwang, B.-H. and S. Kim, 2009. It pays to have friends, *Journal of Financial Economics* 93, 138-158.
- Ivashina, V. and D. Scharfstein, 2010. Bank lending during the financial crisis of 2008, *Journal of Financial Economics* 97, 319-338.
- Katz, I., Geithner says 'Don't Listen to Banks' on financial regulation. *Bloomberg*, July 18, 2011. <http://www.bloomberg.com/news/2011-07-18/geithner-says-don-t-listen-to-banks-on-financial-regulation.html>
- Keeley, M.C., 1990. Deposit insurance, risk, and market power in banking, *American Economic Review* 80, 1183–200.
- Klock, M.S., S.A. Mansi, and W.F. Maxwell, 2005. Does corporate governance matter to bondholders? *Journal of Financial & Quantitative Analysis* 40, 693–719.
- Merton, R., 1973. Theory of rational option pricing, *Bell Journal of Economics and Management Science* 4, 141–83.
- Merton, R., 1977. An analytic derivation of the cost of deposit insurance loan guarantees, *Journal of Banking and Finance* 1, 3–11.
- Metrick, A., 2008. <http://www.som.yale.edu/faculty/am859/data.html>.
- Palia, D. and R. Porter, 2004. The impact of capital requirements and managerial compensation on bank charter value, *Review of Quantitative Finance and Accounting* 23, 191-206.
- Saunders, A. and B.K. Wilson, 2001. An analysis of bank charter value and its risk-constraining incentives, *Journal of Financial Services Research* 19, 185–96.

- Stern, G.H., and R.J. Feldman, 2004. *Too Big to Fail: The Hazards of Bank Bailouts*. Washington, D.C.: Brookings Institution Press.
- Wilmers, R. Small banks, big banks, giant differences. *Bloomberg*, June 12, 2011. <http://www.bloomberg.com/news/2011-06-13/small-banks-big-banks-giant-differences-robert-g-wilmers.html>
- White, H., 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica* 48, 817–38.
- White, L., 2011. Corporate governance and prudential regulation of banks: is there any connection? Unpublished Working Paper, New York University, New York.



**Table 1: Summary Statistics for Sampled Banks in the Pre-Crisis and Crisis Period**

Shown are descriptive statistics for the sample of bank holding companies. Each bank was drawn from the corporate governance index database on Professor Metrick's (Yale University) web site. All pre-crisis variables except PRICE-BOOK use data from the year 2005. All crisis variables except PRICE-BOOK and MANAGER use data from the year 2007. PRICE-BOOK is the price-book ratio for 2006 (the pre-Crisis year) or for 2008 (the crisis year). SIZE is the total value of bank assets (in \$ bill.). ROE is the percentage book return on equity. RETURN is the unadjusted one year percentage stock return. CAPITAL is the equity-assets ratio. MANAGER is the corporate governance index. The most recent data available for MANAGER are from 2005, so 2005 data are used for pre-crisis and crisis periods. INSIDE is the percentage of common shares owned by inside directors (directors who are full-time employees of the bank). OUTSIDE is the percentage of common shares owned by outside blockholders (non-employees of the bank who own at least 5% of the bank's outstanding shares). SALARY is the annual base salary paid to the CEO (in \$ mill.). OPTIONS is the annual value (in \$ mill.) of options granted to the CEO, estimated according to the Black-Scholes (1973) model as modified by Merton (1973) to account for dividends. BONUS is the annual value of bonuses paid to the CEO (in \$ mill.). Summary statistics for dollar values of SIZE and CEO compensation components are reported in this table, however the natural log of assets and scaled values of CEO compensation components are used in regressions. Results for difference in means (crisis value minus pre-crisis value) t-tests are shown with \*\*\* and \*\* indicating statistical significance at the 1% and 5% levels, respectively.

Variable	Pre-Crisis			Crisis			$\Delta$ Means
	Mean (Median)	SD (N)	Max (Min)	Mean (Median)	SD (N)	Max (Min)	
PRICE-BOOK	2.12 (2.02)	0.62 (76)	3.73 (0.73)	1.20 (1.13)	0.69 (76)	3.61 (0.21)	-0.91***
SIZE	84.13 (10.14)	263.36 (76)	1494.04 (1.78)	111.36 (116.45)	362.10 (76)	2187.63 (2.42)	27.23**
ROE	14.11 (13.90)	4.71 (76)	26.55 (-3.49)	9.72 (11.05)	7.13 (76)	24.49 (-26.40)	-4.38***
RETURN	-2.96 (-2.63)	13.48 (76)	20.31 (-77.59)	-23.55 (-21.85)	17.99 (76)	28.15 (-68.57)	-20.58***
CAPITAL	.090 (.090)	.020 (76)	.159 (.033)	.096 (.093)	.022 (76)	.177 (.052)	.005***
MANAGER	9.57 (9.00)	2.87 (76)	15 (3)	9.57 (9.00)	2.87 (76)	15 (3)	0.00
INSIDE	5.35 (2.58)	9.38 (76)	66.90 (0.02)	7.83 (4.64)	10.20 (76)	66.60 (0.01)	2.48***
OUTSIDE	11.18 (10.25)	8.83 (76)	36.6 (0.00)	10.85 (9.31)	9.31 (76)	50.38 (0.00)	-0.33
SALARY	0.68 (0.64)	0.26 (76)	1.50 (0.00)	0.70 (0.71)	0.26 (76)	1.50 (0.00)	0.03
OPTIONS	1.35 (0.32)	3.10 (76)	21.70 (0.00)	0.35 (0.00)	1.30 (76)	7.53 (0.00)	-1.00***
BONUS	1.12 (0.48)	1.99 (76)	12.00 (0.00)	0.36 (0.00)	1.90 (76)	14.5 (0.00)	-0.77***

**Table 2: Bank Charter Value Regression Results for Pre-Crisis and Crisis Period**

Shown are the results of regressing bank price-book ratio (charter value) on several variables. Separate models are estimated for the pre-financial crisis and financial crisis periods. The sample includes 76 large banks. All pre-crisis variables except PRICE-BOOK use data from the year 2005. All crisis variables except PRICE-BOOK and MANAGER use data from the year 2007. PRICE-BOOK is the price-book ratio for 2006 (the pre-Crisis year) or for 2008 (the crisis year). SIZE is the natural log of total value of bank assets. ROE is the percentage book return on equity. RETURN is the unadjusted one year percentage stock return. CAPITAL is the equity-assets ratio. MANAGER is the corporate governance index. The most recent data available for MANAGER are from 2005, so 2005 data are used for pre-crisis and crisis periods. INSIDE is the percentage of common shares owned by inside directors (directors who are full-time employees of the bank). OUTSIDE is the percentage of common shares owned by outside blockholders (non-employees of the bank who own at least 5% of the bank's outstanding shares). SALARY is the annual base salary paid to the CEO. OPTIONS is the annual value of options granted to the CEO, estimated according to the Black-Scholes (1973) model as modified by Merton (1973) to account for dividends. BONUS is the annual value of bonuses paid to the CEO. Dollar values for SALARY, OPTIONS and BONUS are scaled by SIZE in the regressions. Coefficient estimates are shown on the top row for each variable. P-values are shown in parentheses. In all Models heteroskedasticity is present so White's (1980)-corrected standard errors are used.

Variable	Pre-Crisis Model 1	Crisis Model 1	Pre-Crisis Model 2	Crisis Model 2
Intercept	2.4878 (0.000)	4.0787 (0.000)	2.9336 (0.000)	4.5859 (0.000)
SIZE	-0.0644 (0.023)	-0.1517 (0.000)	-0.1391 (0.008)	-0.1175 (0.001)
RETURN	0.0089 (0.093)	0.0195 (0.000)	0.0096 (0.087)	0.0230 (0.000)
ROE	0.0857 (0.000)	0.0171 (0.283)	0.0857 (0.000)	0.0160 (0.261)
CAPITAL	-7.3131 (0.004)	-6.857 (0.002)	-7.5810 (0.004)	-8.6832 (0.001)
MANAGER	-0.0280 (0.020)	-0.0448 (0.022)	-0.0247 (0.065)	-0.0325 (0.099)
SALARY			1.70e-06 (0.538)	-8.33e-06 (0.005)
OPTIONS			3.48e-07 (0.080)	-2.12e-07 (0.624)
BONUS			7.18e-07 (0.122)	-3.67e-07 (0.186)
INSIDE			0.0035 (0.172)	-0.0013 (0.801)
OUTSIDE			0.0019 (0.703)	-0.0097 (0.125)
(Adj.) R <sup>2</sup>	0.636	0.538	0.666	0.592
N	76	76	76	76