

THE RELATIONSHIP BETWEEN BANK CREDIT RISK AND PROFITABILITY AND LIQUIDITY

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ABSTRACT

This paper's objective is to study the relationship between bank credit risk and financial performance and the contribution of risky lending to lower bank profitability and liquidity. The sample data comes from the Mergent Online database, which stores ownership, executive, and financial information about public and private companies. This study focuses on the concept of prudent lending by public state commercial banks, insider ownership, and chief executive officer compensation and tenure, which are governance related bank characteristics. Performance variables in analysis of covariance models include net interest margin, return on assets, return on equity, and cash flow to assets. Preliminary results show a negative relationship between less prudent lending (which may be interpreted as a positive effect of more prudent lending) and net interest margin. However, findings were only statistically significant when the normality assumption was relaxed through the robust regression method. Insider holdings and longer chief executive officer tenure were negatively related to bank performance. This may be a consequence of an adverse effect of the agency problem. Further research should focus on obtaining a deeper understanding of these results and of the underlying causes of the most recent financial crisis, from the viewpoint of different market participants.

JEL: F34; G01; G21; G30; M41

KEYWORDS: International Lending Problems, Financial Crises, Banks, Corporate Governance, Accounting (Financial Statements)

INTRODUCTION

The examination of the causes that contributed to the recent global financial crisis is not a new subject. Much has been said about the alleged culprits; for example, greed in commercial and investment banks, insufficient oversight from bank regulators, and subprime mortgage lending.

This research attempts to probe further into these issues from the point of view of state commercial banks. The objective is to study the relationship between bank risk and financial performance and the contribution of risky lending to lower bank profitability and liquidity. The sample data comes from the Mergent Online database, which stores ownership, executive, and financial information about public and private companies. This study focuses on the concept of prudent lending by public state commercial banks, insider ownership and chief executive officer compensation and tenure, which are governance related bank characteristics. Performance variables in analysis of covariance models include net interest margin, return on assets, return on equity, and cash flow to assets.

The structure of this paper is as follows. First, there is a literature review about the causes of the global financial crisis and characteristics that help banks to be more resilient when facing financial crises. The next section describes the methods used, objectives, samples, and statistical tests and analyses. Then, the results are analyzed and discussed. The last section presents the conclusions and recommendations for future research. This investigation intends to contribute to a further understanding of the present global financial crisis and its implications go beyond bank credit policy decisions to extend to the present debate regarding the United States banking system reform to prevent future crises.

LITERATURE REVIEW

The underlying causes of the global financial crisis are reflected on both of the main financial decisions: investment and financing. On the investment or asset side, security investors' apparent overreliance on credit ratings led them to make poor choices and buy overvalued assets, consisting of mortgage-backed securities. On the financing or liability side, banks as sellers of these securities, backed by cash collections from mortgage loans, suffered losses due to excessive risk taking by lending money to people with insufficient ability to repay (Gurriá, 2008).

This increase in bank's liabilities or leverage, if large and lasting enough, will trigger a financial crisis. This trend has been observed in periods of financial crises, such as the second quarter of 1987, the third quarter of 1998, and, most recently, the third quarter of 2008. This is complicated by having long-term assets in balance sheets, such as mortgage loans, being financed by short-term liabilities. Consequently, banks are obliged to pay cash before asset driven cash collections occur, increasing their illiquidity (Adrian & Shin, 2009). Bank liquidity management involves a tradeoff between the cost of attaining higher liquidity and the cost of inefficient allocation of such liquidity.

Providing financial services across borders helps to transfer liquidity to those locations where it is scarce, but at the cost of probable inefficient fund allocation. These inefficiencies may arise from not having enough cash to finance the maximum possible number of positive net present value, thereby, resulting in lessened opportunities for shareholder value creation (Dietrich & Vollmer, 2010). An important source for bank liquidity is the timely collection of loans and their corresponding interest income. This implies minimizing default loan rates. By the summer of 2008, high default loan rates seriously affected loan collections, and this lessened banks' ability to lend, and, thus, increasing the cost of borrowing. While this phenomenon largely occurred in the United States, the fact that the mortgage-backed securities were sold in other markets caused a domino effect which pulled down the global economy through its effect on European banks (Gurriá, 2008). The 2008 global financial crisis is the major turmoil affecting financial markets since the 1990's when individual countries, such as Argentina, Brazil, Russia, Thailand, Turkey, and the East Asia region faced financial problems (Diamond & Rajan, 2009; Lewis, Kay, Kelso, & Larson, 2010). Brunnermeier (2009) mentions the sharp decrease in housing prices and the resulting increase in mortgage loan defaults in 2007 as the major cause of a liquidity crisis that became a global crisis in 2008. During the period before the years leading to the most recent financial crisis, the United States faced a rising trend in banking consolidation, or decrease in number of banks (Heiney, 2010).

According to Heiney (2010), during the years 2000 to 2005, there was an increase in ROA and a decrease in ROE for banks in the United States. According to the results of a survey made to bank senior managers, the three risk factors that most contributed to the financial crisis were inappropriate risk governance, weak risk culture, and ineffective incentive and remuneration policies (Hashagen, Harman, Conover, & Sharma, 2009). Risk governance is necessary for limiting excessive risk taking, while banks should develop a strong risk culture through the encouragement of an assessment, measurement, and mitigation mindset of bank employees, at all levels, in the organizational hierarchy. In addition, incentive and remuneration policies should reward managers with strong performance, based on attainment of long-term goals and bank shareholder wealth maximization. If proper behavior is rewarded, it will be in the managers' best interest to not make decisions causing bank risk to rise to intolerable levels, resulting in decreased share values when lacking high enough returns (Junarsin & Ismiyanti, 2009). Diminished shareholder value would be an adverse effect of the separation of ownership (shareholders) and control (managers) that gives rise to agency problems (Gong, 2011).

In a study about chief executive officer compensation and tenure in United States commercial banks, there was a positive relationship between both, compensation and tenure, and financial performance (Crumley, 2008). Gong (2011) used two different shareholder value measures – one based on change of

market capitalization; another one, on cumulative abnormal stock returns estimated through the Capital Asset Pricing Model. Assessing the cumulative changes in shareholder value over average chief executive officer tenure, the study's findings showed a positive relationship between chief executive officer compensation and shareholder value and between tenure and shareholder value (Gong, 2011). These results are consistent with those of Crumley (2008).

Not having bank manager goals aligned with shareholder goals is commonly known as the agency problem. This occurs due to managers, acting as agents, to represent the interests of shareholders, who are the principals. The agency problem is larger when ownership is diffuse or a large number of shareholders contribute a relatively small share to bank capital. Higher costs of monitoring agents' actions result in higher moral hazard, the likelihood of poor financial decision making with the objective of improving the managers' wealth, at the expense of shareholders (Junarsin & Ismiyanti, 2009).

Using Hong Kong during the East Asia 1997-1998 crisis as an example of firms' reactions under financial difficulties, Leung and Horwitz (2010) found a positive relationship between ownership of shares by company insiders and financial performance. The resulting merge of ownership and control, through shareholder-managers (company insiders), could contribute to enhanced performance by having managers benefit from decisions yielding increased shareholder value. Consequently, agency costs would be diminished. Shareholder value depends on several factors including, among others, profitability and liquidity. While bank profitability, by itself, does not necessarily lead to increased shareholder values, continued unprofitability will, at one time or another, impair liquidity in such a way as to decrease share values. The total debt to equity ratio is one of the determinants of bank profitability. For lower debt to equity ratios, higher debt financing may motivate managerial behavior resulting in decreased agency costs and, consequently, higher profitability. However, if debt levels reach a high enough level, implying that equity financing is too low, there is no incentive for managers to act for shareholders' benefit and there will also be increased costs related to debt financing, due to higher likelihood of bankruptcy. At these excessive debt levels, total debt to equity may be negatively related to profitability (Paolo, 2011).

However, the findings of several studies suggest a positive relationship between higher debt levels and credit risk and a positive or insignificant relationship between higher debt levels and profitability. Using a regulatory asset risk based measure for credit risk and an indirect measure for debt to equity (based on equity to risk based assets, where higher equity is equivalent to lower debt levels), Salah and Fedhila (2012) found a negative relationship between equity levels and credit risk. Corcoran (2010) obtained similar results. Furthermore, Hsieh and Lee, (2010) uncovered a negative association between equity to assets and profitability. In turn, Gill, Biger, and Mathur (2011) found no significant relationship between long-term debt to total assets and profitability for a group of companies in service industries. Debt and equity are the two main sources of capital for financing investment and operating activities.

Thus, a negative relationship between equity and credit risk implies that higher debt levels are associated with higher credit risk. Higher credit risk may lead to lower profitability due to a greater likelihood of uncollectible amounts owed by bank clients. In regards to corporate governance, banks should have a system of rules, procedures, and regulations to ensure that agency costs, or costs of minimizing the agency problem and, consequently, moral hazard, are as low as possible, as a way to maintain and increase shareholder value. If proper corporate governance systems are in place, they help to reduce the risk of future crises. However, Goddard, Molyneux, and Wilson (2009) claim that government intervention to aid in the financial stability of troubled banks send the wrong signal by allowing for imprudent behavior to occur, in the expectation that, ultimately, the government will approve financial aid to banks if they fail. Examples of government financial aid include the recapitalization of banks and the purchase of impaired assets to improve liquidity in the banking system (Goddard, Molyneux, & Wilson, 2009). These measures are implemented with the goal of achieving financial system stabilization in times of financial crisis. Lessons learned from successful corporate governance practices during financial crises

should serve to identify the characteristics that make banks more resilient, or capable of withstanding them. Contrary to banks in Germany, Netherlands, United Kingdom, and United States, Australian banks did not have to be rescued or “bailed-out” by their respective governments in order to maintain a stable banking system. Through these bail-outs, governments provided additional capital to finance bank assets and operations and prevent them from becoming insolvent and bankrupt.

In the extreme case of Iceland, it was necessary to nationalize banks which implied full transfer of control to the government (Hawtrej, 2009). One outstanding feature of the Australian banking system was the low level of nonperforming loans, which are those with payments in arrears. It did not face the great liquidity problems that arose elsewhere, and even though bank share prices declined due to the crisis, these decreases were not as large as those of their counterparts’ in other countries (Hawtrej, 2009).

Hawtrej (2009) argues that there are several explanations for this resilience. All of them have a common theme: better bank corporate governance. One explanation for bank resilience is a higher loan quality due to responsible lending practices. This, in turn, is a result of boards of directors and executives’ prudence in lending decisions and avoidance of low quality debt securities. The predominance of the lower risk intermediation model (acceptance of deposits and approval of loans) over the higher risk securitization model (approval of mortgage loans and sale of securities backed by loan collections) has been advantageous to Australia. The stress on lending growth in relation to securitization allowed for higher long-term profitability. This benefit was complemented by a greater emphasis on prime lending – low risk bank borrowers – as opposed to subprime lending – high risk borrowers (Hawtrej, 2009).

Even though prime lending has lower credit or default risk, Australian banks were better prepared by ensuring higher provision or reserve for loan losses, which, in turn, was greater than impaired loans (those with a high likelihood of default). Another strength related to bank capital (funds provided by shareholders and bank operations instead of depositors and other creditors) being superior to minimum amounts, based on asset risk (Hawtrej, 2009). Diversity and stability of sources of funds is essential to ensure their availability at not too high costs. This entailed not depending mostly on short-term and local sources, but relying more on long-term and global sources, when compared to banks in other countries (Hawtrej, 2009). Australian banks also resisted the temptation to focus on a short-term instead of a long-term horizon. A longer term focus avoids the search for rapid earnings and share prices’ growth fueled by high risk decision making. Proper risk management was also enhanced by high quality of bank supervision through effectiveness of financial system regulation (Hawtrej, 2009).

Policy recommendations have been made to improve banking system resilience. First, there should be risk management reforms. Corporate governance risk management reforms must ensure that excessive risk taking does not occur, business transactions are fair for involved parties, and consumers are well protected. There must also be greater transparency and accountability among corporate boards and supervision of financial securities, particular those of an innovative complex nature (Araneta, Calderon-Kabigting, Hapitan, Lim, Romagos, & Wee Sit, 2009).

According to a report by the World Bank, bank governance’s failures in four areas were responsible for the financial crisis. These areas are risk governance; remuneration and incentive structures; board composition, qualifications, and independence; and shareholder engagement (The World Bank Group, 2010). The definition for risk governance is “board and management oversight of risk and the attendant configuration of internal systems for identifying, measuring, managing, and reporting risk (The World Bank Group, 2010: 2)”. Risk governance problems arose out of risk information not being timely received by board of directors. There was also an absence of adequate planning for liquidity and funding, on the part of managers. Consequently, managers were also unaware of rising risks to be able to take prompt action before severe declines in asset values and unavailability of market sources of funds (The World Bank Group, 2010). Incentive structures were ineffective due to short-term rewards in the form of

bonuses being paid for dealings in risky securities. These structures should instead have aligned managerial goals with multi period stability, in mind. This would motivate managerial behavior focusing on long term results rather than short-term self-profits from bonuses, obtained by bearing too much risk (The World Bank Group, 2010).

Regarding board composition, there were not enough executive board members. Consequently, the chief executive officers were powerful enough to enable them to not be held accountable for poor decision making. This problem is compounded when the chief executive officer is also the chairman of the board of directors, as usually occurs in major public financial institutions from the United States. In addition, lack of technical risk management expertise, skills, and experience of unqualified directors can complicate this matter. While the presence of nonexecutive directors is necessary to improve board independence, chief executive officers' terms were often longer than those of nonexecutive directors. The relatively high turnover of this group of directors may serve to reinforce the power of chief executive officers with the ensuing high likelihood of adverse consequences of too much power being in the hands of a single person (The World Bank Group, 2010). Shareholder engagement was not active enough to prevent these excesses. Shareholder activism, particularly that of large institutional investors, requires that they exercise their voting rights and monitor managers and board members to reward them for good governance practices (The World Bank Group, 2010).

METHODOLOGY

The main research objective is to determine whether non prudent highly risky lending diminished bank profitability and cash flows during recent years. There are three profitability measures – net interest margin, return on assets, and return on equity. The cash flow measure is change in cash to total assets. Secondary objectives are to explore if typical ownership and executive measures for governance studies, such as insider holdings, chief executive officer's compensation and tenure, on average, have explanatory power over bank profits and cash flows. These measures were obtained on an annual basis.

Empirical Data Sources and Sample Selection

The source for empirical data is the Mergent Online database. The sampling frame consists of the 793 active public companies with Standard Industrial Classification number 6022. This code is used to group state commercial banks. It was decided to select a random sample of 80 banks, about 10% of the total frame. All but one of these 80 banks were from the United States. Since only one bank was from elsewhere, it was dropped from the sample. The final sample totaled 40 banks, for which complete financial information was available for the entire five year, 2005 through 2009 period. Data collection was made on an annual basis. Since there was a total of 40 banks, with yearly data for the five year 2005-2009 period, there were a total of 200 bank observations. Only the latest ownership and executive information is obtained for these 40 banks. Thus, the study has two parts. The first part relates to regression models with variables corresponding to the ownership and executive measures and the latest financial data. The second one tests regression results for all variables but ownership and executive data. For these results, there are 200 total observations, 5 yearly records for each of the 40 sample banks.

Analysis of Covariance Models and Statistical Tests

Regression models are developed including ownership and executive information. Ownership data is the percent of shares held by bank insiders (variable name was "insider"). Executive data include whether bank chief executive officer compensation was higher than the industry average and whether the same occurred for bank chief executive tenure. Dummy variables are used with a value of one for observations with chief executive officer compensation higher than industry average ("compensation" variable), and equal to zero, otherwise. The variable "tenure" is similar to "compensation" except that it referred to

chief executive officer's tenure or time in office. All of these measures are related to the agency problem described earlier. Greater percentage of shares owned by insiders is hypothesized to be associated with financial performance, on the basis of findings obtained by Leung and Horwitz (2010).

It is expected that there be a positive relationship between compensation and tenure and financial performance (Crumley, 2008). If actual results were similar to expected ones, it would suggest that executives having their personal wealth at stake may be motivated to attain a superior firm performance for their own self-interest. The full sample models include five additional dummy or categorical independent variables, one each for every year from 2005 to 2009. Performance independent variables used in different regression models are net interest margin, ROA, ROE, and cash flow to assets.

Net interest margin may be defined as net interest – the difference between total interest income and total interest expense – as a percentage of interest income (Mergent Online, 2010). It is a measure of a bank's efficiency in maintaining interest expenses at a minimum for a given value of interest income. ROA refers to return on assets, calculated as the annualized net income as a percentage of average total assets. ROE corresponds to return on equity. The return on equity formula and the return on assets formula are alike but for the use of average stockholders' equity, instead of average total assets (Mergent Online, 2010). ROA relates to a bank's ability to generate a positive net income from its investment in its assets, while ROE is the return that shareholders receive from their investment in bank capital or equity. The last performance measure, cash flow to total assets, is calculated by obtaining the period's change in cash from the statement of cash flows as a percentage of total assets.

The main independent variable, lesser prudence, is measured as the allowance for loan losses as a percentage of net loans, as reported in the balance sheet. It is assumed that more risky lending practices lead banks to keep a higher provision or allowance for loan losses due to estimated uncollectible loans, relative to their net loans. For this reason, the higher the value of the allowance for loan losses as a percentage of net loans, the lower the prudence or greater likelihood of risk of loan losses. Greater loan losses imply lower cash flows from loan principal and interest collections.

Additional independent variables, used as control variables, are the ratios of loan to deposits and total debt to equity. Loan to deposits is net loans and leases divided by total deposits. It is a measure of bank liquidity. Total debt to equity, a debt management measure, is the ratio of total debt funding to equity funding (Mergent Online, 2010). The higher the loans relative to deposits, the lower the liquidity, due to greater amounts of cash disbursements to bank borrowers in relation to the amount of cash receipts from bank depositors. Lower liquidity diminishes the flexibility of banks to fulfill their cash obligations when due but yields opportunities of higher profitability due to interest revenues.

Higher debt funding holds the potential for increasing returns to shareholders (ROE) through lower requirements of equity investments. This occurs as long as company returns from investment on assets exceed interest costs. Both, the loan to deposits and the total debt to equity ratios were expected to, on average, have a positive relationship with bank profitability. The STATA data analysis statistical package is used to run the analysis of covariance models using ordinary least squares, including fixed effects for categorical variables or covariates. Several diagnostic tests are conducted to detect multicollinearity and heteroscedasticity. The equation for the general analysis of covariance model for the partial sample (40 observations) may be expressed as

$$PV_i = \lambda_0 + \lambda_1 LP_i + \lambda_2 IN_i + \lambda_3 CO_i + \lambda_4 TE_i + \lambda_5 LTD_i + \lambda_6 DTE_i + \varepsilon_i \quad (1)$$

where PV_i is the value for a performance variable (net interest margin, return on assets, return on equity, or cash flow to assets) for bank i , LP_i is the value for the lesser prudence variable for bank i , IN_i is the value for the insider variable for bank i , CO_i is the value for the compensation variable for bank i , TE_i is

the value for the tenure variable for bank i , LTD_i is the value for the loan to deposits variable for bank i , and DTE_i is the value for the debt to equity variable for bank i . The formulation for the full sample (200 observations) general model is

$$PV = X\lambda + Y\mu + \epsilon \tag{2}$$

where PV is the vector of bank observations for a performance variable (net interest margin, return on assets, return on equity, or cash flow to assets), X is the matrix of observations for the lesser prudence, loan to deposits, and debt to equity variables for all banks during the years 2005 to 2009, and Y is the matrix of dummy variables for the observations for years 2005, 2006, 2007, 2008, and 2009.

The command “estat vif” is used to obtain variance inflation factors for independent variables. Since all variance inflation factors were much lower than 10 (Acock, 2008: 238-239), multicollinearity seemed to not be a problem. The test for homoscedasticity is the Breush-Pagan/Cook-Weisberg test. The test statistic is “BP”. SSE_1 stands for the model sum of squares from regressing the squared ordinary least squares (OLS) residuals against each independent variable; SSR, represents the residual sum of squares from the OLS regression; and n , the total number of observations. The formula for BP is as follows.

$$BP = \frac{(SSE_1)/2}{(SSR/n)^2} \tag{3}$$

The BP statistic follows a chi-squared distribution, where the null hypothesis is that the residuals have equal variance (A Note on Heteroskedasticity Tests in Stata, 2010). To correct for heteroscedasticity, a robust estimator for the OLS variance-covariance matrix is obtained. This estimator is the following:

$$\Omega = (Z'Z)^{-1}Z' \left\{ \text{diagonal} \left[\frac{e_i^2}{(1-h_{i,i})^2} \right] \right\} Z(Z'Z)^{-1} \tag{4}$$

where Z is the matrix of independent variable values, e_i^2 is the square of the estimated residual for a particular observation, $h_{i,i} = z_i(Z'Z)^{-1}z_i'$ and z_i is the i th row of the Z matrix (Long & Ervin, 2000: 218). An additional robustness test is the use of residuals-versus-fitted plots to verify the OLS assumption of a normal distribution for the regression residuals. This assumption may be relaxed through the use of STATA’s robust regression option, “vce(robust)” for the estimation of robust standard errors (Acock, 2008: 230-232).

RESULTS

Table 1 presents descriptive statistics for variables in the analysis of covariance models. The percent of shares held by company insiders, which may include executives and members of the board of directors, ranged from as low as 0 to a high of about 30 percent, with an average value of 8.77 percent. It can also be observed that there was a high variability in the lesser prudence variable, as evidenced by the value of its standard deviation. Tables 2 to 5 present results for ordinary least squares (OLS), OLS with heteroscedasticity consistent standard errors, and robust regressions, separately, modeling the relationships between the four dependent variables and the independent variables. For each of these tables, Panel A shows the statistics for the partial sample of 40 observations, controlling for ownership and executive compensation and tenure; while Panel B statistics are for the full sample of 200 bank observations, for the complete five year 2005-2009 period.

Panel A of Table 2 presents analysis of covariance results for the net interest margin dependent variable, controlling for insider holdings, chief executive compensation, and chief executive tenure. The negative

relationship (coefficient equal to -0.01) between lesser prudence (which may be interpreted as a *positive* effect of *higher* prudence) and net interest margin was only statistically significant (for a maximum p-value equal to 0.10) when the normality assumption was relaxed through the robust regression method.

A negative relationship between lesser prudence and net interest margin is shown in Panel B of Table 2 (coefficient equal to -0.01). The same occurred for the total debt to equity ratio, and the opposite, for the loans to deposit ratio. There is also evidence that suggests that net interest margins, on average, decreased during the years 2005, 2007, 2008, and increased in year 2009. The lesser prudence and years 2007, 2008, and 2009 results also held when correcting for heteroscedasticity and relaxing the normality assumption.

Table 1: Descriptive Statistics for Variables in Analysis of Covariance Models

Variable	Mean	Standard Deviation	Minimum	Maximum
Insider	8.77	7.37	0.00	29.61
Net interest margin	58.18	9.96	25.67	81.72
ROA	0.43	1.37	-5.80	2.06
ROE	4.14	18.78	-107.13	24.41
Cash flow to assets	0.61	2.79	-13.24	13.46
Lesser Prudence	34.24	211.06	0.11	1859.11
Loans to deposits	0.95	0.18	0.08	1.35
Total debt to equity	1.22	1.20	0.07	12.66

Net interest margin, ROA, ROE, and Cash flow to assets are, separately, regressed using the remaining governance and performance variables as independent or predictor variables in the linear models. All values, except those for the "insider" variable are for the full 200 bank observations; "insider" values are for the partial sample with 40 bank observations.

When ROA was the dependent variable (see Panel A of Table 3), there was greater statistical significance for the coefficient estimates under robust regression. These results represent evidence that suggests a positive relationship between ROA and lesser prudence (coefficient equal to 0.01) and loans to deposits and a negative one regarding the insider and tenure variables (coefficients equal to -0.09 and -0.42 for insider and tenure variable, respectively). Higher total debt to equity ratios (coefficient equal to -0.30 in Panel B of Table 3) were, on average, associated with lower ROA. ROA tended to be higher during years 2005 through 2007 (see Panel B of Table 3). Similar results were obtained for ROE, as a dependent variable, as may be observed from the negative coefficient (-7.17) in Panel B of Table 4. The negative relationship between total debt to equity and profitability, as measured by ROE, is consistent with the theoretical explanation and findings in the research performed by Paolo (2011) as it relates to very high debt levels.

The sign of the coefficient of the lesser prudence measure was positive in the ROE models, though not significant at the 0.10 level, when dealing with heteroscedasticity. Similar results also were obtained for the sign of the coefficients of the lesser prudence, loans to deposits, and insider variables for the ROE independent variable in Table 4 under ordinary least squares and robust regression. However, when correcting for heteroscedasticity, most of the coefficient estimates were not statistically significant.

Lesser prudence was, on average, related to higher cash flow to assets while there was a significantly negative sign for the loans to deposits ratio (as can be seen from the -2.06 coefficient in Panel B of Table 5). The negative sign for loans to deposits was as expected as a measure of decreased liquidity. Additional results were lower cash flow to assets for years 2007 and 2008, critical periods for the global financial crisis; however, a cash flow recovery was apparent in 2009. In turn, during the 2005-2007 period, there was evidence of an increase in both ROA and ROE (see Tables 3 and 4). There was an apparent reversal of the decreasing trend in ROE and a continuing increasing trend in ROE for United States' banks when comparing these results to those of Heiney (2010). The negative sign for insider and tenure, in Tables 3 and 4, contradicts the findings of Crumley (2008) and Leung and Horwitz (2010). A possible explanation is that bank executives are, indeed, greedy and search for highly risky alternatives to

boost short-term profits to gain more bonuses, at the expense of long term earning stability. However, there is not enough evidence to support this conclusion since only information for the latest period was available for the values of the governance variables.

Table 2: Relationship of Lesser Prudence in Lending Practices to Net Interest Margin

Panel A: Insider Holdings, Chief Executive Officer Compensation, and Chief Executive Officer Tenure, as Control Variables for Partial Sample of 40 Observations			
Variables	OLS	OLS with HCSE	RobustRegression
Lesser prudence	-0.01 (0.01)	-0.01 (0.45)	-0.01** (0.01)
Insider	-0.34 (0.24)	-0.34 (0.30)	-0.34 (0.25)
Compensation	0.54 (5.36)	0.54 (6.81)	0.54 (5.27)
Tenure	0.85 (3.39)	0.85 (4.18)	0.85 (3.51)
Loans to deposits	-1.40 (10.22)	-1.40 (18.85)	-1.40 (10.23)
Total debt to equity	-1.36* (0.81)	-1.36 (3.54)	-1.36 (1.00)

Panel B: Dummy Variables for Years 2005 to 2009 for Full Sample of 200 Observations			
Year 2009	57.31*** (3.30)	57.31*** (6.43)	57.31*** (5.80)
Year 2008	-8.44*** (1.90)	-8.44*** (2.10)	-8.44*** (2.02)
Year 2007	-14.52*** (1.92)	-14.52*** (2.03)	-14.52*** (1.96)
Year 2006	-11.04 (1.91)	-11.04*** (2.15)	-11.04*** (2.07)
Year 2005	-2.22** (1.90)	-2.22 (2.14)	-2.22 (2.05)
Lesser prudence	-0.01*** (0.01)	-0.01*** (0.01)	-0.01*** (0.01)
Loans to deposits	10.67*** (3.48)	10.67 (6.95)	10.67* (6.17)
Total debt to equity	-1.44*** (0.51)	-1.44 (1.16)	-1.44*** (0.68)

Panel A: The model parameter estimates were obtained from applying the ordinary least squares regression method, with lesser prudence equal to (Allowance for loan losses / Net loans) x 100. There were 40 bank observations. The F statistic (6, 33) was 1.00, significant at the 0.44 level, under ordinary least squares; F statistic (6,33) was 0.37, significant at the 0.89 level, under ordinary least squares with heteroscedasticity corrected standard errors (OLS with HCSE); F statistic (6,33) was 4.64, significant at the 0.01 level, under robust regression. Standard errors for parameter estimates are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01 Panel B: The model parameter estimates were obtained from applying the ordinary least squares regression method, with lesser prudence equal to (Allowance for loan losses / Net loans) x 100. There were 200 bank observations. The F statistic (7, 192) was 12.73, significant at the 0.01 level, under ordinary least squares; F statistic (7,192) was 13.82, significant at the 0.01 level, under ordinary least squares with heteroscedasticity corrected standard errors (OLS with HCSE); F statistic (7,192) was 16.15, significant at the 0.01 level, under robust regression. Standard errors for parameter estimates are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

The positive sign for the loans to deposits ratio coefficient, in the ROA and ROE models, is as expected (see Tables 3 and 4). The positive sign of the lower prudence variable coefficient may be due to greater conservatism in the uncollectible loans' estimate, and consequently, increasing the balance of the allowance account.

Table 3: Relationship of Lesser Prudence in Lending Practices to ROA

Panel A: Insider Holdings, Chief Executive Officer Compensation, and Chief Executive Officer Tenure, as Control Variables for Partial Sample of 40 Observations			
Variables	OLS	OLS with HCSE	Robust Regression
Lesser prudence	0.01 (0.01)	0.01 (0.80)	0.01*** (0.01)
Insider	-0.09 (0.04)	-0.09* (0.05)	-0.09** (0.04)
Compensation	-0.48 (0.84)	-0.48 (1.19)	-0.48 (0.61)
Tenure	-0.42 (0.53)	-0.42 (0.58)	-0.42** (0.54)
Loans to deposits	2.44 (1.60)	2.44 (2.47)	2.44*** (1.22)
Total debt to equity	-0.30** (0.13)	-0.30 (0.27)	-0.30 (0.05)

Panel B: Dummy Variables for Years 2005 to 2009 for Full Sample of 200 Observations			
Variables	OLS	OLS with HCSE	Robust Regression
Year 2009	-0.50 (0.45)	-0.50 (0.49)	-0.50 (0.46)
Year 2008	0.20 (0.26)	0.20 (0.39)	0.20 (0.38)
Year 2007	1.28*** (0.26)	1.28*** (0.27)	1.28*** (0.27)
Year 2006	1.40*** (0.26)	1.40*** (0.27)	1.40*** (0.26)
Year 2005	1.46*** (0.26)	1.46*** (0.27)	1.46*** (0.27)
Lesser prudence	0.01 (0.01)	0.01 (0.01)	0.01* (0.01)
Loans to deposits	0.43 (0.47)	0.43 (0.43)	0.43 (0.40)
Total debt to equity	-0.30*** (0.07)	-0.30*** (0.05)	-0.30*** (0.05)

Panel A: The model parameter estimates were obtained from applying the ordinary least squares regression method, with lesser prudence equal to (Allowance for loan losses / Net loans) x 100. There were 40 bank observations. The F statistic (6,33) was 3.00, significant at the 0.02 level, under ordinary least squares; F statistic (6,33) was 10.21, significant at the 0.01 level, under ordinary least squares with heteroscedasticity corrected standard errors (OLS with HCSE); F statistic (6,33) was 44.98, significant at the 0.01 level, under robust regression.. Standard errors for parameter estimates are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.0 Panel B: The model parameter estimates were obtained from applying the ordinary least squares regression method, with lesser prudence equal to (Allowance for loan losses / Net loans) x 100. There were 200 bank observations. The F statistic (7, 192) was 13.55, significant at the 0.01 level, under ordinary least squares; F statistic (7,192) was 10.34, significant at the 0.01 level, under ordinary least squares with heteroscedasticity corrected standard errors (OLS with HCSE); F statistic (7,192) was 11.22, significant at the 0.01 level, under robust regression.. Standard errors for parameter estimates are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

The lesser prudence variable also had a positive coefficient (0.01) for the cash flow to assets variable, in Table 5. The result is significant for other than heteroscedasticity consistent standard errors. Under robust regression, chief executive officer compensation being higher than the industry average (compensation variable), on average, was associated with a decrease in the ratio of cash flow to assets (-1.97 coefficient for compensation variable in Panel A of Table 5).

Table 4: Relationship of Lesser Prudence in Lending Practices to ROE

Panel A: Insider Holdings, Chief Executive Officer Compensation, and Chief Executive Officer Tenure, as Control Variables for Partial Sample of 40 Observations			
Variables	OLS	OLS with HCSE	Robust Regression
Lesser prudence	0.02* (0.01)	0.02 (10.53)	0.02*** (0.01)
Insider	-1.24** (0.50)	-1.24 (0.78)	-1.24** (0.59)
Compensation	-4.41 (11.25)	-4.41 (15.57)	-4.41 (7.41)
Tenure	-5.75 (7.13)	-5.75 (7.93)	-5.75 (7.27)
Loans to deposits	38.04* (21.48)	38.04 (38.06)	38.04** (17.80)
Total debt to equity	-9.13*** (1.71)	-9.13*** (3.51)	-9.13*** (0.54)

Panel B: Dummy Variables for Years 2005 to 2009 for Full Sample of 200 Observations			
Variables	OLS	OLS with HCSE	Robust Regression
Year 2009	-8.13 (5.63)	-8.13 (6.59)	-8.13 (6.29)
Year 2008	6.07* (3.24)	6.07 (4.79)	6.07 (4.67)
Year 2007	17.19*** (3.27)	17.19*** (3.63)	17.19*** (3.56)
Year 2006	17.99*** (3.26)	17.99*** (3.62)	17.99*** (3.55)
Year 2005	19.38*** (3.24)	19.38*** (3.71)	19.38*** (3.63)
Lesser prudence	0.01* (0.01)	0.01 (0.01)	0.01** (0.01)
Loans to deposits	9.09 (5.94)	9.09 (5.96)	9.09* (5.44)
Total debt to equity	-7.17*** (0.87)	-7.17*** (1.53)	-7.17*** (1.00)

Panel A: The model parameter estimates were obtained from applying the ordinary least squares regression method, with lesser prudence equal to (Allowance for loan losses / Net loans) x 100. There were 40 bank observations. The F statistic (6, 33) was 7.42, significant at the 0.01 level, under ordinary least squares; F statistic (6,33) was 57.40, significant at the 0.01 level, under ordinary least squares with heteroscedasticity corrected standard errors (OLS with HCSE); F statistic (6,33) was 176.21, significant at the 0.01 level, under robust regression. Standard errors for parameter estimates are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.0 Panel B: The model parameter estimates were obtained from applying the ordinary least squares regression method, with lesser prudence equal to (Allowance for loan losses / Net loans) x 100. There were 200 bank observations. The F statistic (7, 192) was 21.62, significant at the 0.01 level, under ordinary least squares; F statistic (7,192) was 8.93, significant at the 0.01 level, under ordinary least squares with heteroscedasticity corrected standard errors (OLS with HCSE); F statistic (7,192) was 12.24, significant at the 0.01 level, under robust regression. Standard errors for parameter estimates are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01

CONCLUSIONS

This research was done to explore the relationship between increases in bank risk and the global financial crisis. The analysis was made in two phases. The first one considered the latest data available, including insider holdings and chief executive officer compensation and tenure. The second one extended the financial data set to the years 2005 to 2009, for a total of 200 bank observations. The findings suggest that insider holdings and chief executive officer having a higher tenure may be negatively related to bank performance. This may be an adverse effect of the agency problem. However, more evidence should be obtained before this finding may be generalized. Expected results were the negative relationship between loans to deposits and cash flows. Higher loans to deposits ratio may be seen as a signal of lower liquidity due to greater amounts of cash given to borrowers relative to those received from depositors. When considering the results for the complete 200 observation data set, in general, there appears to be a positive relationship between the measure that represents lesser prudence in lending and financial performance.

This suggests that higher prudence, on average, led to lower bank performance. However, it may very well be that the allowance for loan losses to net loans measure used as a proxy for lesser prudence, instead was influenced by greater conservatism and, consequently, higher than expected balances for the allowance for loan losses account.

Table 5: Relationship of Lesser Prudence in Lending Practices to Cash Flow to Assets

Panel A: Insider Holdings, Chief Executive Officer Compensation, and Chief Executive Officer Tenure, as Control Variables for Partial Sample of 40 Observations			
Variables	OLS	OLS with HCSE	Robust Regression
Lesser prudence	0.01 [*] (0.01)	0.01 (0.28)	0.01 ^{***} (0.01)
Insider	-0.04 (0.07)	-0.04 (0.07)	-0.04 (0.06)
Compensation	-1.97 (1.48)	-1.97 (1.67)	-1.97 (1.10)
Tenure	1.28 (0.94)	1.28 (1.12)	1.28 (0.94)
Loans to deposits	-2.68 (2.82)	-2.68 (6.68)	-2.68 (2.99)
Total debt to equity	0.29 (0.23)	0.29 (0.91)	0.29 (0.26)
Panel B: Dummy Variables for Years 2005 to 2009 for Full Sample of 200 Observations			
Variables	OLS	OLS with HCSE	Robust Regression
Year 2009	2.95 ^{***} (1.05)	2.95 ^{***} (1.09)	2.95 ^{***} (1.02)
Year 2008	-1.24 ^{**} (0.61)	-1.24 [*] (0.67)	-1.24 [*] (0.65)
Year 2007	-1.74 ^{***} (0.61)	-1.74 ^{***} (0.63)	-1.74 ^{***} (0.61)
Year 2006	-1.00 (0.61)	-1.00 [*] (0.55)	-1.00 [*] (0.53)
Year 2005	-0.29 (0.61)	-0.29 (0.61)	-0.29 (0.59)
Lesser prudence	0.01 [*] (0.01)	0.01 (0.01)	0.01 (0.01)
Loans to deposits	-2.06 [*] (1.11)	-2.06 [*] (1.12)	-2.06 ^{**} (1.03)
Total debt to equity	0.33 ^{**} (0.16)	0.33 (0.24)	0.33 [*] (0.17)

*Panel A: The model parameter estimates were obtained from applying the ordinary least squares regression method, with lesser prudence equal to (Allowance for loan losses / Net loans) x 100. There were 40 bank observations. The F statistic (6, 33) was 2.16, significant at the 0.07 level, under ordinary least squares; F statistic (6,33) was 0.85, significant at the 0.54 level, under ordinary least squares with heteroscedasticity corrected standard errors (OLS with HCSE); F statistic (6,33) was 63.23, significant at the 0.01 level, under robust regression. Standard errors for parameter estimates are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.0 Panel B: The model parameter estimates were obtained from applying the ordinary least squares regression method, with lesser prudence equal to (Allowance for loan losses / Net loans) x 100. There were 200 bank observations. The F statistic (7, 192) was 3.47, significant at the 0.01 level, under ordinary least squares; F statistic (7,192) was 2.36, significant at the 0.02 level, under ordinary least squares with heteroscedasticity corrected standard errors (OLS with HCSE); F statistic (7,192) was 63.23, significant at the 0.01 level, under robust regression. Standard errors for parameter estimates are in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01*

A limitation of this research is that governance variables – insider, compensation, and tenure – were only considered for the most recent time period. However, the value for these measures may change over time for any particular bank, included in the sample. Another scope limitation was the fact that for the full sample of 200 observations, the time-series data analysis did not account for the possibility of having values for particular years' observations influencing the value of a future year's observation. If such influences were to exist, they could affect the results for the coefficients of different variables, including the dummy variables. These variables had the same sign (negative or positive) under every model related to each particular performance variable, except for the year 2009, where a sign reversal occurred. For example, as can be seen from Panel B of Table 2 the coefficients for the years 2005, 2006, 2007, and 2008, were equal to -2.22, -11.04, -14.42, and -8.44, respectively, while the one for the year 2009 was 57.31. Furthermore, the sample was limited to United States' actively public state commercial banks. Consequently, results may not be generalized to other types of banks or other countries. Other limitations

were the use of as single credit risk measure and the exclusive use of financial statement data. Bank profitability data is useful to help assess future cash flow prospects. However, the risk inherent in such cash flows may lead to decreasing shareholder values even under periods of higher profitability, since profitability, in and of itself, does not ensure value creation.

These limitations suggest several possibilities for future research. Future studies should measure insider, compensation, and tenure variables over time. Further analysis should be performed to obtain a better understanding of the differences that may arise due to time series effects, as opposed to changes occurring within cross-sectional data. Additional credit risk measures should be employed as a test for the robustness of results. Future research should also broaden the sample to include a more diverse sample of bank observations, as well as banks from different countries. There should also be studies exploring the relationship between bank credit risk and shareholder value, using market value data of shares of publicly held companies in the banking industry. Future research should also be conducted to obtain a deeper understanding of the underlying causes of the most recent financial crisis, from the viewpoint of different market participants.

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