Risk Management, Corporate Governance, and Bank Performance During the Financial Crisis*

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Abstract

The recent financial crisis has raised several questions with respect to the corporate governance of financial institutions. This paper investigates whether risk management-related corporate governance mechanisms, such as for example the presence of a chief risk officer (CRO) in a bank's executive board and whether the CRO reports to the CEO or directly to the board of directors, is associated with a better bank performance during the financial crisis of 2007/2008. We measure bank performance by buy-and-hold returns, ROA, and ROE and we control for standard corporate governance variables such as CEO ownership, board size, and board independence. Most importantly, our results indicate that banks, in which the CRO directly reports to the board of directors and not to the CEO (or other corporate entities), exhibit significantly higher (i.e., less negative) stock returns, ROA, and ROE during the crisis. In contrast, standard corporate governance variables are mostly insignificantly or even negatively related to the banks' performance during the crisis.

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1. Introduction

This paper investigates whether the presence of a chief risk officer (CRO) in the executive board of a bank and other risk management-related corporate governance mechanisms (which are also termed "risk governance") positively affect bank performance during the recent financial crisis. The paper combines and further develops relevant previous findings from three major areas of research: corporate governance, enterprise risk management (ERM), and bank performance.

Whereas scandals such as Enron and Worldcom gave primarily rise to new developments in accounting practices, the financial crisis following the subprime meltdown in the U.S. has led to a further growing awareness and need for appropriate risk management techniques and structures within financial organizations.[1] In quantitative risk management, the focus lies on how to improve the measurement and management of specific risks such as liquidity risk, credit risk, and market risk. On a structural level, the issue of how to integrate these risks into one single message to senior executives is being addressed. Earlier literature on risk management focused on single types of risk while missing out on the interdependence to other risks (Miller, 1992). Consequently, only in the 1990's, the academic literature started to focus on an integrated view of risk management (e.g., Cumming and Mirtle, 2001; Miccolis and Shaw, 2000; Miller, 1992; Nocco and Stulz, 2006; Sabato, 2010).

In addition, public policy makers around the world have started to question the appropriateness of the current corporate governance applied to financial institutions. In particular the role and the profile of risk management in financial institutions has been put under scrutiny. In many recent policy documents, comprehensive risk management frameworks are outlined in combination with recommended governance structures (e.g., BIS, 2008; FSA, 2008; IIF, 2007; Walker, 2009). One common recommendation is to "put risk high on the agenda" by creating respective structures. This can involve many different actions. As already claimed by the Sarbanes-Oxley Act (SOX) in 2002, financial expertise is considered to play an important role. Other, more specific measures involve either the creation of a dedicated risk committee or designating a CRO who over-

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[1] There are also recent academic studies which emphasize that flaws in bank governance played an important role in the poor performance of banks during the financial crisis of 2007/2008 (e.g., Diamond and Rajan, 2009). Also a recent OECD report concludes that the financial crisis can be to an important extent attributed to failures and weaknesses in corporate governance arrangements (Kirkpatrick, 2009).

sees all relevant risks within the institution (e.g., Brancato, Tonello, Hexter, and Newman, 2006; Sabato, 2010).

Mongiardino and Plath (2010) show that the risk governance in large banks seems to have improved only to a limited extent despite increased regulatory pressure induced by the credit crisis. They outline best practices in banking risk governance and highlight the need to have at least (1) a dedicated board-level risk committee, of which (2) a majority should be independent, and (3) that the CRO should be part of the bank's executive board. By surveying 20 large banks, however, they find only a small number of banks to follow best practices in 2007. Even though most large banks had a dedicated risk committee, most of them met very infrequently. Also, most risk committees were not comprised of enough independent and financially knowledgeable members (see also Hau and Thum, 2010). And most of those large banks had a CRO but its position and reporting line did not ensure an appropriate level of accessibility and thus influence on the CEO and the board of directors. The results of Hashagen, Harman, Conover, and Sharma (2009), which are based on a large survey among 500 senior managers involved in the risk management at leading banks around the world, confirm the finding of suboptimal risk governance structures in the majority of banks: 76% of the interviewed risk managers feel that the risk function is still being stigmatized as a support function and 45% believe that their organization lacks experience in risk management at the board level.[2]

Whereas the role and importance of the CRO, and risk governance more generally, in the banking industry has been highlighted in the newspapers (see Figure 1), in various reports (Brancato, Tonello, Hexter, and Newman, 2006), as well as in practitioner-oriented studies (e.g., Banham, 2000), it has not been analyzed in the academic literature so far. Some other aspects of corporate governance in banks, such as board characteristics and CEO pay structure, have been addressed in recent academic studies (e.g., Beltratti and Stulz, 2010; Erkens, Hung, and Matos, 2010; Fahlenbrach and Stulz, 2011). However, the literature on corporate governance and the valuation effect of corporate governance in financial firms is still very limited. Financial institutions do have their particularities, such as higher opaqueness, heavy regulation and intervention by the government (Levine, 2004), which require a distinct analysis of corporate governance issues. Consist-

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[2] Previous to the financial crisis of 2007/2008, the vast majority of banks did not have a CRO, but only a Head of Risk usually reporting to the CFO with no access to or influence on the short- or long-term strategy (and the associated risks) of the bank.

ently, Adams and Mehran (2003) and Macey and O'Hara (2003) highlight the importance of taking differences in governance between banking and non-banking firms into consideration.

In this paper, we argue that one important difference between financial and non-financial firms, that has to be taken into account, is the role of risk management in the governance structure of financial firms. While the importance of risk management has been recognized, the actual role of risk management in a corporate governance context still lacks common interpretation. Most banks still seem to consider asset growth and a reduction of operational costs as the main drivers of profitability. Risk management has often the role of a support/control function. However, the last financial crisis has clearly demonstrated that the business of banks *is* risk, therefore the legitimate question arises whether the CRO should not hold a more important and powerful role within banks. As Warren Buffet stated in his 2008 letter to the shareholders of Berkshire Hathaway Inc., his belief is "that the CEO of any large financial organization *must* be the Chief Risk Officer as well". The consequence in the end would be a governance system contrary to the one prevailing today, with the executive officers reporting to the CRO and not the other way round.

The two recent studies by Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011) analyze the influence of corporate governance on bank performance during the credit crisis. However, both studies rely on variables that have been used in the literature to analyze the relation between corporate governance and firm value of non-financial institutions. Specifically, Fahlenbrach and Stulz (2011) analyze the influence of CEO incentives and share ownership on bank performance and find no evidence for a better performance of banks in which the incentives provided by the CEO's pay package are stronger (i.e., the fraction of equity-based compensation is higher). In fact, their evidence rather points to banks providing stronger incentives to CEOs performing worse in the crisis. A possible explanation for this finding is that CEOs may have focused on the interests of shareholders in the build-up to the crisis and took actions that they believed the market would welcome. Ex post, however, these actions were costly to their banks and their shareholders when the results turned out to be poor. Moreover, their results indicate that option-based compensation had no negative influence on bank performance, that bank CEOs did not reduce their stock holdings in anticipation of the crisis, and that

CEOs did not hedge their holdings. Hence, their results suggest that bank CEOs did not anticipate the crisis and the resulting poor performance of the banks as they suffered huge losses themselves.[3]

Beltratti and Stulz (2010) investigate the relation between corporate governance and bank performance during the credit crisis in an international sample of 98 banks. Most importantly, they find that banks with more shareholder-friendly boards as measured by the "Corporate Governance Quotient" (CGQ) obtained from RiskMetrics performed worse during the crisis, which indicates that the generally shared understanding of "good governance" does not necessarily have to be in the best interest of shareholders. Beltratti and Stulz (2010) argue that "banks that were pushed by their boards to maximize shareholder wealth before the crisis took risks that were understood to create shareholder wealth, but were costly ex post because of outcomes that were not expected when the risks were taken" (p. 3). In addition, they find that financial variables such as the tier 1 capital ratio, deposits as a percentage of total assets, and bank profitability are more important determinants of bank performance during the crisis than are governance and regulation.

Similar to Beltratti and Stulz (2010), Erkens, Hung, and Matos (2010) investigate the relation between corporate governance and the performance of financial firms during credit crisis of 2007/2008. Erkens, Hung, and Matos (2010) use an international sample of 296 financial firms from 30 countries. Consistent with Beltratti and Stulz (2010), they find that firms with more independent boards and higher institutional ownership experienced worse stock returns during the crisis. They argue that firms with higher institutional ownership took more risk prior to the crisis which resulted in larger shareholder losses during the crisis period. Moreover, firms with more independent boards raised more equity capital during the crisis, which led to a wealth transfer from existing shareholders to debtholders.

In this paper, we aim at extending the literature by analyzing the influence of bank-specific corporate governance, and in particular "risk governance" characteristics on the

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[3] In another recent study, however, Bebchuk, Cohen, and Spamann (2010) provide evidence that the top-five executive teams of Bear Stearns and Lehman Brothers cashed out large amounts of performance-based compensation during the 2000-2008 period. Moreover, they were able to cash out large amounts of bonus compensation that was not clawed back when the firms collapsed, as well as to pocket large amounts from selling shares.

performance of banks during the financial crisis. The measures of risk governance that we use are the following: a dummy variable whether the CRO is a member of the executive board, whether the CRO directly reports to the board of directors, whether the CRO reports to the CEO, the percentage of directors on the board with a finance background, whether there is a dedicated risk committee, the number of meetings of such a risk committee, and the percentage of independent directors in the risk committee. All these variables are hand-collected from 10k (annual report) and Def 14A (Proxy Statement) forms in the SEC's EDGAR Database for a sample of 372 U.S. banks in 2006. In addition, we control for standard corporate governance variables used in previous studies on corporate governance in non-banks (e.g., Gompers, Ishii, and Metrick, 2003; Hoechle, Schmid, Walter, and Yermack, 2010) and in Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011) for banks. Examples are board size, board independence, whether the CEO is also chairman of the board, board busyness, institutional ownership, CEO ownership, and the corporate governance index based on takeover provisions as proposed by Gompers, Ishii, and Metrick (2003). This additional corporate governance data is obtained from the RiskMetrics (formerly IRRC) Directors and Governance databases, from Standard and Poor's ExecuComp database, and from Thomson Financial's CDA/Spectrum database. Hence, this paper extends current research on corporate governance in banks by both broadening the perspective on corporate governance and bank performance, as well as deepening the understanding of the role of risk management in a banking context.

As in Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011), we collect our measures of corporate governance for 2006, the last complete year before the financial crisis. We then investigate whether corporate governance at the end of the year 2006 is significantly related to the banks' stock returns, ROA, and ROE during the crisis period. Following Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011), we define the crisis period to last from July 1, 2007, to December 31, 2008. Depending on the regression setup and, in particular, the corporate governance mechanisms included, our regressions include between 54 and 372 observations. Our results provide robust evidence that banks in which the CRO reports directly to the board of directors perform significantly better in the credit crisis while banks in which the CRO reports to the CEO perform significantly worse than other banks in our sample. This result confirms our hypothesis that the typical corporate governance structure with all executive board members reporting to the CEO is not the most appropriate for banking organizations. A possible explanation

for this finding may be that CEOs' main interest is to maximize growth in sales, assets, and profits – possibly both in the shareholders' as well as his own interest as growth helps to maximize the value of the personal remuneration package as well as prestige and power (e.g., managerial empire building).[4] Hence, the CEO's assessment and treatment of risk might be substantially different from that of the CRO. In other words, the CEO and CRO may have conflicting interests and while a stronger role of the CEO may increase growth and profitability in a good market environment, it may result in large losses in crises periods such as the recent credit crisis of 2007/2008 and vice versa.

In contrast, the relation between most of our other measures of risk governance and bank performance in the crisis is insignificant. Moreover, our results with respect to the standard corporate governance mechanisms indicate that a bank's stock returns (and ROA and ROE) during the crisis are either unaffected by standard corporate governance variables, such as CEO ownership or the corporate governance index of Gomper, Ishii, and Metrick (2003), or are even negatively related to certain governance mechanisms such as board size (i.e., positively related with board size which is usually considered to indicate poor governance; e.g., see Yermack, 1996) or board independence. Hence, our results on the "standard" corporate governance mechanisms are largely consistent with Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011). There results are consistent with the view that banks were pushed by their boards to maximize shareholder wealth before the crisis and thereby took risks that were understood to create wealth but later turned out poorly in the credit crisis.

The remainder of this paper is organized as follows. Section 2 describes the sample and the variables. Section 3 reports the empirical results. Section 4 concludes.

2.   Data and Variables

2.1   Sample selection

As in Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011), we collect data on various corporate governance variables for the year 2006, the last complete year before the financial crisis. As a starting point for our sample, we use all banks available in the COMPUSTAT Bank North America database in 2006. The initial count of 770 bank-

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[4] Moreover, stock option holdings increase the CEO's incentives to take risks as long as these options are not too much in the money.

years is reduced by all observations for which either a key variable (total assets, common shares outstanding, total common/ordinary equity, income before extraordinary items) is missing or total assets are less than USD 100 Mio. Additionally, we drop all bank-years which are not covered by the Center for Research in Security Prices (CRSP) database. This leaves us with a sample of 573 banks.

In a next step, we hand-collect corporate governance data from the banks' 10k (annual report) and Def 14A (proxy statement) forms in the SEC's EDGAR Database. We collect data on whether the CRO is a member of the executive board, the existence of a board risk committee, board size, board independence, and the (finance) background of board members. The availability (i.e., reporting) of these variables further reduces our sample size to 372 banks which constitute the larger set of banks we use in our empirical analyses of Section 3. As we restrict our sample to banks included in the COMPUSTAT Bank North America database, all banks in our sample are either primarily commercial banks (SIC code 6020) or savings institutions (SIC codes 6035 and 6036).[5]

We augment the set of five hand-collected corporate governance variables by nine additional governance variables from four commercial databases: IRRC Governance Legacy database, IRRC Directors Legacy database, Standard & Poor's ExecuComp database, and Thomson Financial's CDA/Spectrum database. The availability of these variables reduces sample size to between 55 and 86 observations.

Finally, we hand-collect another five corporate/risk governance variables, which provide more detailed information on the risk committee and on the line of reporting of the CRO, from the companies' annual filings. As all these variables have to be hand-collected from the banks' annual reports in a time-consuming way, we restrict the sample to the 86 banks with data available on the corporate governance index of Gompers, Ishii, and Metrick (2003), as obtained from the IRRC Governance Legacy database. The resulting sample size then ranges from 54 to 85 observations as one bank does not provide

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[5] Specifically, 283 of the 372 sample banks have a primary SIC code of 6020 assigned which indicates commercial banks, 61 banks have a primary SIC code of 6035 assigned which indicates federally chartered savings institutions, and 28 banks have a primary SIC code of 6036 assigned which indicates not federally chartered savings institutions. The respective NAICS codes are 522110 for the 283 commercial banks and 522120 for the 89 savings institutions.

sufficient information regarding its risk committee and the line of reporting of the CRO in its annual report to be included in our sample.[6]

2.2 Measures of bank performance

We use three alternative measures of bank performance. Following Fahlenbrach and Stulz (2011) and Beltratti and Stulz (2010), our first measure of bank performance are the banks' buy-and-hold returns over the time period July 1, 2007, to December 31, 2008 (*Buy-and-hold returns*). We use monthly holding period returns from CRSP to compute cumulative buy-and-hold returns.

Alternatively, in unreported robustness tests, we use alphas from a Carhart (1997) 4-factor model instead of raw returns. The alphas are estimated as the intercept of the following time-series regression which is estimated at the bank level:

$$R_t = \alpha + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \varepsilon_t \tag{1}$$

where R_t is the excess return to the respective bank's stock in month t, $RMRF_t$ is the month t value-weighted market return minus the risk-free rate, and SMB_t (small minus big), HML_t (high minus low), and MOM_t are the month t returns on zero-investment factor-mimicking portfolios designed to capture size, book-to-market, and momentum effects, respectively.[7]

In further unreported robustness tests, we also extend the crisis period to include the 21 months from July 1, 2007, to March 31, 2009. For the alpha estimation, we exclude all banks with less than 12 observations for the 18-month-period and in case of the 21-month-period all banks with less than 12 observations for the first 18 months or no observation for the three months of the year 2009.[8]

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[6] It is important to note that collecting data on all 372 banks with data available on the first five corporate governance mechanisms (i.e., whether the CRO is a member of the executive board, the existence of a board risk committee, board size, board independence, and the (finance) background of board members) would not substantially increase sample size as the vast majority of the smaller banks do not report the necessary information in their annual report (e.g., on the line of reporting of the CRO).

[7] For details on the construction of the factors, see Fama and French (1993) and Carhart (1997). We obtained the data on all four risk factors from Kenneth French's website at:
http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[8] The results based on all these alternative return-based measures of bank performance are similar and therefore we only report results based on the 18-month buy-and-hold returns, as used in both Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011), for space reasons.

As alternative measures of bank performance, we use two measures of bank profitability during the crisis. The first profitability measure we use is return on assets (*ROA*), defined as the banks' cumulative net income over the years 2007 and 2008, divided by total assets as of year end 2006. The second profitability measure we use is return on equity (*ROE*), defined as the banks' cumulative net income over the years 2007 and 2008, divided by the book value of equity as of year end 2006.[9]

2.3   Corporate governance variables

Due to limited availability of governance data on banks as well as the neglect of risk management-specific governance data on commercial governance databases, such as for example IRRC / RiskMetrics, we hand-collect most of our corporate governance variables from the companies' 10k filings, proxy statements, and from company websites. For the first group of five hand-collected corporate governance variables, we target all 372 banks for which the 2006 annual report and 2007 proxy statement are available.

The first variable we collect data on is a dummy variable whether the CRO is a member of the executive board (*CRO in executive board*). If the CRO is a member of the executive board, his influence and power are expected to be larger as compared to a CRO who is situated on the third management level. 49 of the 372 banks report that the CRO is a member of the executive board.[10] It is important to note that a strong CRO is not necessarily increasing bank value, in particular not in all market states. Even though the market in the short-run should perceive the appointment of a CRO to the executive board positively, the attitude might change over time if the CRO is powerful enough to be rigid during economic upturns. Before the 2007/2008 credit crisis banks had extremely high returns on equity of around 30%. In order to further increase profits and to satisfy shareholders, more risks had to be taken. In addition liquidity seemed endless.[11] At this point in time, a CRO should both recognize the tremendous risks and be able to induce the necessary reduction in risk exposure and concentrations. However, doing so may result in shareholders getting relatively lower returns compared to their peers in the industry with

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[9] Alternatively, we define *ROA* (*ROE*) as the banks' cumulative net income over the years 2007 to 2009, divided by total assets (the book value of equity) as of year end 2006. The results remain similar and therefore are not reported in a table for space reasons.

[10] The 49 banks use the following titles: Chief Risk Officer, Chief Strategy and Risk Officer, Chief Credit and Risk Officer, Global Risk Executive, Director of Risk Management, Chief Risk Manager, Executive Vice President – Risk Management, Executive VP – Finance & Risk, and Risk Management Officer.

[11] A detailed analysis of the financial crisis of 2007/2008 is provided by Brunnermeier (2009).

a weaker risk management structure, which might be difficult to explain to investors and even lead to decreasing stock prices. Therefore, the financial crisis of 2007/2008 provides an interesting setup to test the value of risk governance (and corporate governance more generally) which should then be recognized by the market and reflected in stock prices.

The second governance variable is a dummy variable, which is equal to one if the bank has a dedicated committee solely charged with monitoring and managing the risk management efforts within the bank (*Risk committee*). Banks, for which the variable *Risk committee* has a value of zero, have either no committee in charge of risk management at all or the audit committee assumes responsibility. We would expect that having a risk committee in general indicates a stronger risk management and therefore better corporate governance. However, as for other board committees, the structure of the committee, the independence of the directors in the committee may matter as well – or even more. Therefore, we collect additional information on the risk committee for a reduced sample as explained below.

The third governance variable is board size, measured as the natural logarithm of the number of directors on a bank's board (*Ln(Board size)*). Yermack (1996) finds a negative relation between board size and firm value as measured by Tobin's Q. Adams and Mehran (2003) find that bank holding companies have on average larger boards of directors than manufacturing firms. They notice that these differences could be explained by regulatory differences as the regulatory requirements imposed on banks may act as substitutes for a sound corporate governance structure. Consequently, board size may be a less important corporate governance characteristic for banks as compared to non-banks. In fact, Beltratti and Stulz (2010), using conventional indicators of good governance, even find that banks with more shareholder-friendly boards performed worse during the crisis. The fourth variable we collect data on is board independence as measured by the percentage of independent outside directors on the board of directors (*Board independence*). We define independent directors as directors without any relation with the company except for their board seat. Hence, we classify directors with prior executive function, with a family relationship with an executive officer of the bank, or with any other business ties, such as for example lawyers or consultants doing other work for the bank as non-independent (or "gray") directors. For non-banks, Hermalin and Weisbach (1991)

and Bhagat and Black (2002) find no significant relation between the percentage of out-side directors and firm value (for a review of the literature, see Hermalin and Weisbach, 2003). Adams (2009) shows that banks with more independent board members even received relatively more money from the Troubled Assets Relief Program (TARP), which indicates that banks with a higher share of independent board members performed worse during the crisis. This finding is consistent with Beltratti and Stulz (2010).

The fifth variable is the percentage of directors with experience (present or past) as an executive officer in a bank or insurance company (*% directors w. finance background*).[12] Recent corporate accounting scandals have led regulators to stress the importance of having financial experts on the board of directors. As stated in the Sarbanes-Oxley Act of 2002, a financial expert has among other things "an understanding of generally accepted accounting principles and financial statements".[13] Implicitly the assumption is that this understanding will lead to a better board oversight and ultimately serve the shareholders. In fact, Güner, Malmendier, and Tate (2008) find that financial experts significantly affect the finance and investment policies of (non-bank) firms on whose board they serve. They categorize outside directors into eight categories and find that the appointment of a commercial banker reduces the sensitivity of investment to cash flow as they extend large loans, particularly through their own bank. However, financially restricted firms do not benefit from such practices and financing is only increased for firms with a good credit and financial standing, but poor investment opportunities. Hence, banker directors seem to act in the interest of creditors. Moreover, the appointment of investment bankers to a board of directors is associated with larger debt issues and worse acquisitions.

We augment this set of five hand-collected corporate governance variables by nine additional governance variables from commercial databases. The first variable, which we obtain from the IRRC Governance Legacy database, is the widely-used corporate governance index, or *G-Index*, of Gompers, Ishii, and Metrick (2003). The G-Index comprises 24 corporate governance provisions related to the companies' anti-takeover protection. The 24 governance attributes are coded in a way that a value of one indicates a stronger

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[12] In unreported robustness tests, we use a broader definition of finance background. Specifically, we also classify CPAs, CFAs, mutual fund, hedge fund, or private equity fund managers, REIT managers or professors in finance, economics, or accounting as directors with finance background. However, the results remain virtually unchanged and therefore are not reported in any tables.

[13] See Section 407 "Disclosure of Audit Committee Financial Expert" of the Sarbanes-Oxley Act.

anti-takeover protection (and therefore lower shareholder rights) and a value of zero indicates more exposure to the market for corporate control (and therefore better shareholder rights). As the index is simply the sum of the 24 attributes, lower index values indicate stronger shareholder rights and vice versa. In unreported robustness tests, we use a reduced version of the G-Index as proposed by Bebchuk, Cohen, and Ferrell (2009). This index, usually termed 'E-Index', includes only those six provisions which have been shown to be mainly responsible for the negative relation between the G-Index and firm value.[14]

We collect six variables related to the board of directors from the IRRC Directors Legacy database. The first variable is a dummy variable whether CEO is also the chairman of the board of directors. Fama and Jensen (1983) and Jensen (1993) argue that agency costs in large organizations can be reduced by separating decision management from decision control, and that the board of directors is only an effective device for decision control if it limits the decision discretion of top managers. However, the majority of empirical studies find no significant difference in valuation between firms with separated and firms with combined CEO/chairman positions (e.g., Brickley, Coles, and Jarrell, 1997; Dahya and Travlos, 2000; Schmid and Zimmermann, 2008). Brickley, Coles, and Jarrell (1997) conclude that the costs associated with a breakup of a combined position are larger than the benefits for the majority of firms. The second variable is defined as the fraction of the board which predates the appointment of the CEO (*% of directors joining board before CEO*). These directors are presumably more independent from the CEO and more likely (and willing) to provide monitoring tasks and enforce unpopular decisions such as for example a CEO turnover. The next variable is the fraction of directors on the board that is older than 72 (*% of directors older than 72*). Often it is argued that in weakly governed firms with no effective process for evaluating individual directors, old incumbent directors may be allowed to stay on a board as long as they wish. Hence, a high fraction of old directors (aged 72 or older) may indicate poor governance and in particular a lack of a sound evaluation process of directors.[15] The fourth variable aims at measuring attendance problems of the board of directors (*Director non-attendance*). The variable is defined as the percentage of directors who attend less than

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[14] The six provisions are: 1) Staggered board, 2) Limitation on amending bylaws, 3) Limitation on amending the charter, 4) Supermajority to approve a merger, 5) Golden parachute, and 6) Poison pill.
[15] It is important to note that in certain cases such „old" directors may in fact be the most effective and productive directors as they presumably are also the most experienced directors.

75% of board meetings. Following Fich and Shivdasani (2006), we also use a dummy variable for whether a board is busy (*Busy board*). Specifically, we classify a board as busy if a majority of outside directors holds three or more directorships. The sixth and final variable is a dummy variable which equals one if the bank's nominating committee is exclusively comprised of independent directors (*Independent nominating committee*).

As equity ownership may provide important incentives to bank CEOs to maximize bank value and limit the bank's risk exposure, we include the CEO's equity ownership as an additional corporate governance variable (*Ln(USD ownership of CEO)*). Specifically, our measure of CEO ownership is defined as the natural logarithm of the U.S. dollar value of all shares owned by the CEO as obtained from Standard and Poor's ExecuComp database. While there is a large literature on CEO ownership in non-banking firms, the literature on banks is limited. Adams and Mehran (2003) show that bank CEOs receive less stock and option-based compensation compared to other industries. However, the use of such performance-based compensation packages is increasing. Fahlenbrach and Stulz (2011) analyze whether a bank's performance during the credit crisis of 2007/2008 is related to the CEO's incentives. Their results suggest that, if anything, banks with stronger CEO-incentives performed worse during the crisis. They argue that CEOs may have focused on the interests of their shareholders in the build-up to the crisis and took actions that they believed the market would welcome. Ex post, these actions turned out to be costly to their banks and shareholders. Consistent with this, they show that CEOs did not adjust their holdings in anticipation of the crisis and suffered very large losses.

Finally, we use the percentage of institutional shareholdings, i.e., shareholders owning more than 5% of a firm's equity, as a further corporate governance variable (*Institutional shareholdings*). We obtain the data on this variable from Thomson Financial's CDA/Spectrum database. As owners of such large blocks of shares may have the necessary knowledge, power, and incentives to provide monitoring and exert control, the variable *Institutional shareholdings* may either enhance the effectiveness of other corporate governance mechanisms or work as a substitute for them.

We extend this set of 14 corporate governance variables by five additional hand-collected corporate governance variables which provide more detailed information on the risk committee and on the line of reporting of the CRO. As all these variables have to be hand-collected from the banks' annual reports in a time-consuming way, we restrict the

sample to the 86 banks with data on the *G-Index* available. For banks with a risk commit-tee, we additionally collect data on the number of times the risk committee of the respective banks met in 2006 (*Nr. of meetings of risk committee*), the number of directors in the risk committee (*Nr. of directors in risk committee*), and the percentage of independent directors in the risk committee (*% of indep. directors in risk committee*). All three of these variables are assigned a value of zero for banks with no risk committee. In addition, we collect data on two variables related to the line of reporting and therefore power of the CRO within the banks: A dummy variable whether the CRO reports directly to the board of directors (*CRO reports to board*) and a dummy variable whether the CRO reports to the CEO (*CRO reports to CEO*). We expect that a CRO has more power if he reports directly to the board of directors as the CEO (or CFO) might be mainly interested in maximizing the growth of sales, assets, and profits as this helps to maximize the value of the personal remuneration package as well as his prestige and power (e.g., managerial empire building). Moreover, if the CEO gets a significant part of his compensation in restricted stock options, the value of his option holdings increases with increasing volatility. Hence, the CEO may actually profit from more bank risk.[16]

2.4 Financial control variables

In our regressions, we control for various bank characteristics as of end of the year 2006 which may help to explain bank performance during the financial crisis. The data to construct all these variables are obtained from the COMPUSTAT Bank North America database. The choice of control variables is based on Laeven and Levine (2007), Beltratti and Stulz (2010), and Fahlenbrach and Stulz (2011), and partly dictated by data availability. We start with the four variables used in Fahlenbrach and Stulz (2011) and augment our set of control variables by another three variables.

The first variable is the 18-month buy-and-hold returns over the time period July 1, 2005, to December 31, 2006 (*Buy-and-hold returns (lagged)*) to investigate whether banks performing well before the crisis are taking on larger risks which are then reflected

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[16] In addition, we collected data on specific risk committees (such as for example a market risk committee). However, the dummy variable measuring the existence of specific risk committees is never estimated significantly in our empirical analyses in Section 3. Therefore, we only report results on the *Risk committee* variable but not any dummy variables indicating specific risk committees.

in poor performance during the crisis.[17] In the regressions with *ROA* (or *ROE*) as dependent variables we additionally control for lagged *ROA* (or *ROE*) defined as the banks' net income divided by total assets (the book value of equity), both variables as of year end 2006. To investigate whether the market valuation of the firm, and therefore the market's growth expectations, are associated with the performance during the crisis, we use the market-to-book ratio (*Market-to-book ratio*). The third variable is bank size (*Ln(assets)*), measured as the log of total assets. The fourth variable is the ratio of tier 1 capital to total risk-weighted assets (*Tier1 capital ratio*) which, from a regulator's point of view, is a core measure of a bank's financial strength. Everything else equal, we would expect banks' performance during the crisis to be positively related to *Tier1 capital ratio* before the crisis since a bank with more capital would suffer less from the debt overhang problem (Myers, 1977) and would have more flexibility to respond to adverse shocks.

The next variable we include is the ratio of deposits to total assets (*Deposits/assets*). As deposit financing is not subject to runs with deposit insurance, but money market funding is subject to runs (e.g., Gorton, 2010), we would expect that banks with more deposit financing perform better during the crisis. We use the ratio of loans to total assets (*Loans/assets*) to characterize the asset side of banks. Specifically, banks with higher values of *Loans/assets* are banks with a smaller portfolio of securities. If banks that held fewer loans had more credit-risky securities, we would expect these banks to have performed worse because of the increase in credit spreads that took place during the crisis. In contrast, banks that held government securities instead of loans would presumably have performed better (e.g., Beltratti and Stulz, 2010). Hence, the expected relation between *Loans/assets* and bank performance is unclear.

Finally, Laeven and Levine (2007) and Schmid and Walter (2009) show that a functional diversification of financial institutions is negatively associated with firm value. As diversification may be related to both firm value and corporate governance (see Hoechle, Schmid, Walter, and Yermack, 2010), we additionally control for the banks' diversification activities. Our measure of the diversity of a bank's business is based on Laeven and Levine (2007) and attempts to measure where a bank lies along the spectrum

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[17] Alternatively, depending on the return variable used as dependent variable, we use the 21-month buy-and-hold returns over the time period April 1, 2005, to December 31, 2006, or the Carhart (1997) alpha of the monthly returns over the lagged 18- or 21-month time period.

from pure commercial banking (i.e., lending) to specialized investment banking (i.e., fee/trading-based activities). The variable *Income diversity* is defined as follows:

$$Income\ diversity = 1 - \left| \frac{\text{Net interest income - Other operating income}}{\text{Total operating income}} \right| \qquad (2)$$

Net interest income is interest income minus interest expense. Other operating income includes net fee income, net commission income, and net trading income. Total operating income includes net interest income, net fee income, net trading income, and net commission income. A specialized loan-making bank will have a larger ratio of net interest income to total operating income, while a specialized investment bank is expected to have a larger share of other operating income (fees, commissions, and trading income). *Income diversity* takes on values between zero and one with higher values indicating greater diversification.[18]

We winsorize the variables *Buy-and-hold returns*, *Buy-and-hold returns (lagged)*, *ROA*, *ROA (lagged)*, *ROE*, *ROE (lagged)*, *Market-to-book ratio*, *Tier 1 capital ratio*, *Deposits/assets*, and *Loans/assets* at the 1st and 99th percentile. In unreported robustness tests, however, we find our results to remain qualitatively unchanged if we omit this winsorizing.

3.   Empirical Analysis

3.1   *Descriptive statistics*

Table 1 reports descriptive statistics for our measures of bank crisis performance, the corporate and risk governance variables, and the financial control variables. Panel A reports descriptive statistics for the large sample including 372 bank observations. Panel B reports descriptive statistics for the reduced sample which is restricted to banks for which data on additional corporate governance variables is available from RiskMetrics and Execucomp.

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[18] In unreported robustness tests, we additionally use a number of additional control variables such as for example the natural logarithm of bank age and leverage defined as total debt (calculated as total assets minus the book value of equity) divided by total assets. While the former is never estimated to be significant in the multivariate analyses, the coefficient on leverage is always negative and sometimes significant indicating a negative relation between leverage in 2006 and stock returns during the credit crisis.

The results in Panel A show that, as expected, our sample banks performed very poorly during the credit crisis. The average (median) bank had a stock price performance of -38.01% (-42.85%) over the 18-month crisis period. This is comparable to, but even somewhat higher than the mean (median) bank crisis return of -51.49% (-52.34%) reported by Beltratti and Stulz (2010) for their sample of 164 international banks. In contrast, our sample banks did quite well during the 18-month period ending in December 2006 with mean (median) returns of 16.00% (13.17%). Mean ROA and ROE also decreased in the crisis as compared to their values in 2006. However, the median, 75-percentile, and maximum values increased in the crisis as compared to their 2006 values. In contrast, the minimum and 25-percentile values substantially decreased as expected. Regarding the size of our sample banks, Panel A reports a mean (median) asset value of USD 17.81 (1.27) billion for the 372 U.S. banks. Hence, our sample includes more and smaller banks than the samples in both Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011). Beltratti and Stulz (2010) report a mean (median) asset value of USD 348.96 (130.18) billion for their sample of 164 international banks and Fahlenbrach and Stulz (2011) of USD 129.31 (15.50) billion for their sample of 95 U.S. banks. Both of these samples are more comparable to our smaller sample including 85 U.S. banks and summarized in Panel B of Table 1. The mean (and median) asset value in Panel B is USD 63.06 (10.06) billion. The average (median) *Tier 1 capital ratio* is 11.4% (10.76%), indicating that most banks in our sample are well capitalized in 2006. Even the minimum *Tier 1 capital ratio* of 5.51% is considerably higher than the prevailing regulatory requirement of 4% in 2006 (BIS, 2006). For space reasons, we do not comment on the descriptive statistics of the other financial control variables.

Regarding our corporate and risk governance variables, we find that 12.63% of the banks in our sample have a CRO in their executive board in 2006. This figure is lower as compared to previously reported figures (e.g., Brancato, Tonello, Hexter, and Newman, 2006; Ross, 2005). However, our sample is substantially larger and includes also smaller banks than these studies. In fact, in unreported tests, we find that the mean (median) asset value of banks with a CRO in the executive board is USD 86.30 (7.25) billion as compared to USD 7.90 (1.05) billion for banks which do not. 8.06% of our sample banks have a dedicated risk committee. Mean (median) board size is 10.77 (10) directors for 2006. This figure is smaller than those reported in Adams and Mehran (2003) and Andres and Vallelado (2008) for example. There might be two reasons for the finding of smaller

boards of directors. First, our sample is substantially larger than the one in Adams and Mehran (2003) and includes smaller banks. In fact, the correlation between bank size and board size is 0.43 and statistically significant at the 1% level.[19] Second, Adams and Mehran (2003) show that there is a trend towards smaller boards in the time period from 1986 to 1999. As our descriptive statistics are based on 2006, the lower figures may partly result from this trend. The mean and median values of *Board independence* are 77.52% and 78.57%, respectively. Only three banks in our sample do not have a majority of independent directors on the board (and therefore do not fulfill the independence requirements as set forth by the NYSE). Compared to earlier studies the percentage of independent directors seems to have increased (e.g., Adams and Mehran, 2003) confirming the trend of increasing board independence induced by regulatory efforts. About one fifth (22.47%) of the directors in our sample banks have a finance background, defined as having executive experience in either a bank or an insurance company. Finally, 29.91% (25.00%) of the mean (median) bank in our sample is owned by large blockholders with an ownership stake of 5% or more.

The descriptive statistics on the smaller sample of 85 banks in Panel B reveal that the performance of these relatively larger banks was better during the crisis as compared to the return figures in Panel A, with a mean (median) return of -26.03% (-27.19%). Similarly, mean and median crisis ROA and ROE are also somewhat higher for the sample in Panel B. Consistent with the previous discussion, the percentage of banks with a CRO in the executive board is substantially higher in this sample of larger banks (36.47% − or 31 banks). Moreover, the percentage of banks with a dedicated risk committee is substantially higher, 23.53% as compared to 8.06%, and board size is substantially larger with a mean (median) number of directors on the board of 12.89 (13.00). In contrast, the percentage of independent outside directors and directors with finance background on the board is similar between the two samples. For the firms with a risk committee, the average number of meetings of the risk committee is 4.14 times a year, the mean percentage of independent outside directors in the risk committee is 56.44%, and the average number of directors in the risk committee is 2.82. Of the 85 banks, seven banks (8.24%) have a CRO who reports directly to the board of directors. Six banks (7.06%) have a CRO who reports to the CEO. The mean (median) value of the G-Index is 9.67 (10.00). Crem-

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[19] Consequently, board size is larger in the smaller sample reported in Panel B, containing larger banks. Mean (median) board size is 12.89 (13.00) for the sample of 85 large U.S. banks.

ers and Ferrell (2010) report a median value of 10 for their sample of approximately 1,800 financial and non-financial firms in 2006. Hence, the anti-takeover protection in our sample of large U.S. banks seems to be very similar to that of non-financial firms. 76.36% of the banks in our sample have a nominating committee that is exclusively comprised of independent directors. 76.36% of sample banks have a combined CEO/chairman position. 43.79% of directors joined the board before the current CEO took office, 8.56% of directors are older than 72 years, and only 1.23% of directors attended less than 75% of board meetings in 2006. 7.27% of boards are classified as busy, indicating that a majority of outside directors holds three or more directorships.

3.2 Multivariate analysis

Table 2 reports the results from regressions of *Buy-and-hold returns* on alternative sets of corporate / risk governance variables, and control variables. The regression specification reported in Column 1 only includes the set of five hand-collected corporate governance variables with availability for all 372 sample banks along with *Institutional shareholdings* and the seven control variables. The regression specification in Column 2 additionally includes the *G-Index*. Column 3 additionally includes the six corporate governance variables related to the board of directors and obtained from the RiskMetrics Directors Legacy database. Column 4 includes both, the G-Index as well as the six board characteristics included in Column 3. Column 5 includes the five hand-collected corporate governance variables with availability for all 372 sample banks, *Institutional shareholdings*, and the measure of CEO ownership, *Ln(USE CEO ownership)*. Finally, Column 6 includes all 14 corporate / risk governance measures included in Columns 1 to 5.

Most importantly, the results show that the coefficients on both *CRO in executive board* and *Risk committee* are never estimated to be significant. Hence, having a CRO in the executive board and having a risk committee both do not seem to positively affect the banks stock returns during the recent credit crisis. The coefficient on *Ln(Board size)* is always positive and significant in five of the six specifications. The variable measuring the percentage of independent outside directors on the board is negative in all six specifications and significant in four of them. This finding is consistent with Adams (2009) who shows that banks that received money from the TARP (Troubled Asset Relief Program) fund have more independent boards. Hence, board characteristics that are usually consid-

ered good corporate governance were negatively related with bank performance during the credit crisis.[20] This finding is consistent with Beltratti and Stulz (2010) and may indicate that banks were pushed by their boards to maximize shareholder wealth before the crisis and took risks that were understood to create wealth but later turned out poorly during the credit crisis. The coefficient on *% directors w. finance background* is negative in all six columns and significant in four of them. This finding contradicts the recently often heard call for having more financial experts on the board of directors. As this finding is in fact somewhat counter-intuitive, we additionally tested a broader definition of the variable *% directors w. finance background* which includes, besides former and present executive officers in a bank or insurance company, CPAs, CFAs, mutual fund, hedge fund, or private equity fund managers, REIT managers or professors in finance, economics, and accounting as directors with finance background. Based on this alternative specification, the coefficient on the *% directors w. finance background* remains negative in all six specifications but is significant only in the first column (at the 5% level). Similarly, the coefficient on *Institutional shareholdings* is negative in all specifications and statistically significant in Columns 1, 2, and 5. Hence, blockholders do not seem to have been able to provide effective monitoring with respect to the risks taken in the banks. The coefficients on all six board characteristics obtained from RiskMetrics as well as on the CEO's USD ownership are insignificant in all specifications.

Consistent with Beltratti and Stulz (2010), we find a negative and significant coefficient on the lagged buy-and-hold returns in Column 1. This finding is also consistent with the notion that banks that suffered the most from the crisis appeared to have policies that the market favored before the crisis. However, this result does not hold in our smaller samples in Columns 2 to 6. Also Fahlenbrach and Stulz (2011) find no significant relation between the banks stock returns in the crisis and pre-crisis returns. The coefficient on the market-to-book ratio is always positive and significant in the first three specifications. This finding is consistent with Fahlenbrach and Stulz (2011), reporting a negative relation between the book-to-market ratio and crisis returns. Possibly banks with low market valuations (and growth potential) in 2006 took larger risks which then turned out poorly. The coefficient on the variable *Loans/assets* is estimated to be negative and significant in all six columns. Hence, our sample banks seem to have held mainly low-risk

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[20] Adams and Mehran (2003) provide an additional (or alternative) explanation for a positive relation between board size and bank performance: The size of bank boards may need to be larger, at least as compared to industrial firms, due to a higher complexity of the business and the related advisory requirements.

securities, such as government bonds, instead of loans. Beltratti and Stulz (2010) also report negative but mostly insignificant coefficients on this variable. It is important to note that in our sample of commercial banks and savings institutions the mean and median values of *Loans/assets* are very high, 69.69% and 71.29%.[21] The coefficients on all other control variables are mostly insignificant.

Table 3 reports the results of the same six regressions as reported in Table 2 but augmented with the five additional variables related to risk governance: *Nr. of meetings of the risk committee*, *Nr. of directors in risk committee*, *% of indep. directors in risk committee*, *CRO reports to board*, and *CRO reports to CEO*. The results show that once we control for additional characteristics of the risk committee (and risk governance more generally), the coefficient on *Risk committee* is negative and significant in Columns 1 and 2 while the coefficient on *Nr. of meetings of the risk committee* is positive and significant. Hence, simply having a risk committee does not seem to be beneficial for the banks' crisis performance. However, having a more dedicated committee that meets more frequently seems to positively affect the banks' performance in the crisis. Most importantly, however, the results in Table 3 show that banks, in which the CRO reports directly to the board of directors, perform significantly better during the credit crisis than other banks. This result supports our initial hypothesis that risk governance in general and the line of reporting of the CRO in particular are important to the banks' crisis performance. Our empirical results support the many qualitative statements about the importance of an effective reporting line from the CRO to the board of directors (e.g., Mongiardino and Plath, 2010; Sabato, 2010). In contrast, banks in which the CRO reports to the CEO perform significantly worse, which is congruent with our hypothesis that the CEO may have a different agenda than the CRO, thus neglecting the importance of risk and emphasizing the growth of assets without a defined risk appetite strategy. The results with respect to all other corporate governance (and financial control) variables remain qualitatively unchanged.

In Table 4, we replace *Buy-and-hold returns* as dependent variable by *ROA* (Columns 1 to 3) and *ROE* (Columns 4 to 6). As the results remain qualitatively similar as in Tables and 2 and 3, we only report the results for the specifications in Columns 1, 2, and 5 of Table 3. These specifications include the original five hand-collected governance

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[21] The respective values in Beltratti and Stulz (2010) are 55.82% and 58.71%.

variables included in Table 2, *Institutional shareholdings*, the five additional hand-collected governance variables related to the banks' risk management as included in Table 3, the *G-Index* (in Columns 2 and 5), and *Ln(USD CEO ownership)* (in Columns 3 and 6). The coefficients on the six board characteristics from RiskMetrics are never estimated to be significant and further reduce sample size while the reported results remain similar. Therefore, we do not report further specifications including these variables for space reasons. Most importantly, the coefficient on *CRO reports to board* remains positive and significant and the coefficient on *CRO reports to CEO* remains negative and significant in all specifications. The coefficient on Risk committee is now negative and significant in all six Columns while both the *Nr. of meetings of the risk committee* and *Nr. of directors in risk committee* are positive and significant in all specifications. Hence, the results in Table 4 confirm the previous finding of Table 3 that just having a risk committee does not necessarily help banks' crisis performance. However, having a more dedicated committee that meets more frequently and is larger seems to positively affect the banks performance in the crisis. An important difference as compared to Tables 2 and 3 is that the coefficients on both *Ln(Board size)* and *Board independence* are now insignificant in all specifications. In contrast, the coefficient on *Institutional shareholdings* remains negative in all and (borderline) significant in four specifications.

There is one important change in the control variables. The coefficient on *Income diversity* is estimated negative and significant in all specifications. This result is consistent with Laeven and Levine (2007) and Schmid and Walter (2009) who both show that a functional diversification of financial institutions is negatively associated with firm value. However, the finding that diversification is negatively associated with the banks' returns in the credit crisis is surprising as we would expect that this exactly when the benefits diversification are most important. Hence, either diversification is associated with so many cost-driving problems reducing the banks' profitability that even in financial crises the costs of diversification outweigh the benefits and/or the commercial banks and savings institutions in our sample diversified into activity areas that were hit even harder by the crisis. In fact, in unreported tests, we find that a higher value of *Income diversity* is associated with a larger share of other operating income (fees, commissions, and trading income) as compared to total operating income indicating investment banking activities (the correlation is 0.57 and significant at the 1% level).

We perform a number of robustness tests. First, and as explained in Section 2.2, we use the alpha from a Carhart (1997) four factor model instead of raw returns as a measure of the banks' crisis performance. Second, we extend the crisis period to include the 21 months from July 2007 to March 2009 for both the buy-and-hold returns as well as the Carhart (1997) alpha. Third, we alternatively define *ROA* (*ROE*) as the banks' cumulative net income over the years 2007 to 2009, divided by total assets (the book value of equity) as of year end 2006. Next, we include leverage and the natural logarithm of bank age as additional control variables in the regressions. Finally, we repeat all analyses and omit the winsorizing of the variables *Buy-and-hold returns*, *Buy-and-hold returns (lagged)*, *ROA*, *ROA (lagged)*, *ROE*, *ROE (lagged)*, *Market-to-book ratio*, *Tier 1 capital ratio*, *Deposits/assets*, and *Loans/assets*. The results of all these robustness tests remain qualitatively similar and therefore are not reported in tables for space reasons.

4. Conclusion

In this paper, we analyze the influence of bank-specific corporate governance, and in particular "risk governance" characteristics on the performance of banks during the financial crisis. We complement the risk governance variables, which are hand-collected from 10k (annual report) and Def 14A (Proxy Statement) forms in the SEC's EDGAR Database, with standard corporate governance mechanisms such as for example CEO ownership from ExecuComp and board size, board independence, and the G-Index proposed by Gompers, Ishii, and Metrick (2003) obtained from RiskMetrics. As in Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011), we collect the different measures of corporate governance for the year 2006, the last complete year before the financial crisis. We then investigate whether the banks' corporate governance structure at the end of the year 2006 is significantly related to the banks' stock returns, ROA, and ROE during the crisis period, defined from July 1, 2007, to December 31, 2008.

Most importantly, our results show that banks, in which the CRO reports directly to the board of directors, perform significantly better in the financial crisis while banks in which the CRO reports to the CEO perform significantly worse than other banks in our sample. A possible explanation for this finding may be that the CEOs' main interest is to maximize growth in sales, assets, and profits – possibly both in the shareholders' as well as his own interest as growth helps to maximize the value of the personal remuneration

package as well as prestige and power (e.g., managerial empire building). Hence, the assessment and treatment of risk might be a lower priority for a CEO. In other words, the CEO and CRO may have conflicting interests and if one reports to the other, the risk agenda may not receive the appropriate attention.

To overcome this issue, many regulators have recently started to force CEOs and executive boards to focus more on risk management issues. However, we believe that this change can only be effective if it is also reflected in the banks' corporate governance structure, assigning a stronger role to the CRO with the objective to decrease the volatility of losses during negative market conditions. Ultimately, it is a choice between having a more stable and sound financial system or continuing to manage banks as speculative companies where the latter may result in a socialization of losses occurring in crisis periods while the gains accruing in a good market environment are privatized.

In contrast, and consistent with Beltratti and Stulz (2010) and Fahlenbrach and Stulz (2011), we find either no significant or even a negative relation between a bank's performance during the crisis and standard corporate governance variables such as CEO ownership, board independence, or shareholder rights as proxied by the G-Index of Gompers, Ishii, and Metrick (2003). This may indicate that banks were pushed by their boards to maximize shareholder wealth before the crisis and took risks that were understood to create wealth but later turned out poorly in the credit crisis.

Our results show that standard governance measures as used in the large body of literature on corporate governance and its valuation effect in non-financial firms may fall short in describing the relevant governance structure of banks, in particular with respect to their crisis performance. Our results highlight the importance of the so-called "risk governance" in banks. Specifically, we conclude that banks, to be better prepared to face the next financial crisis, have to significantly improve the quality and profile of their risk management function, but also embed the appropriate risk governance having CEO and CRO at the same level, ideally both reporting to the board of directors. This, however, may come at the cost of a lower performance in a normal (i.e., non-crisis) market environment.

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Figure 1: Articles referencing CROs in the news for the period January 2000 to October 2010
This figure illustrates the increase of articles related to CROs in the news as approximated by a search conducted in Dow Jones Factiva. Factiva includes more than 8,000 sources. The search has been conducted both for all industry sectors and for the banking sector only.
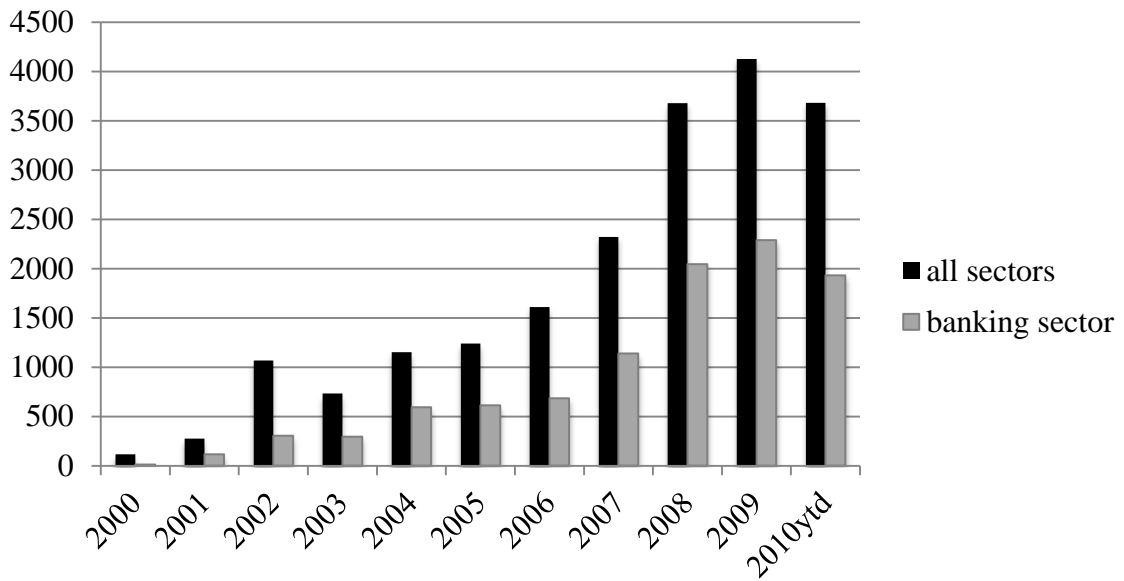
Table 1: Descriptive statistics

The table reports descriptive statistics for all variables used in the paper's main analyses for the large sample of 372 banks (Panel A) and the restricted sample with data available for both the RiskMetrics Governance Legacy database *and* hand-collected corporate and risk governance variables (Panel B). The variables included in both Panel A and B are: *Buy-and-hold returns* are the banks' stock returns over the period from July 2007 to December 2008. *Buy-and-hold returns (lagged)* are the banks' stock returns over the period from July 2005 to December 2006. *ROA* is the banks' cumulative net income over the years 2007 and 2008, divided by total assets as of year end 2006. *ROA (lagged)* is the banks' net income divided by total assets, both variables as of year end 2006. *ROE* is the banks' cumulative net income over the years 2007 and 2008, divided by the book value of equity as of year end 2006. *ROE (lagged)* is the banks' net income divided by the book value of equity, both variables as of year end 2006. *CRO in executive board* is a dummy variable which is equal to one, if the bank's CRO is a member of the executive board. *Risk committee* is a dummy variable whether the bank has a risk committee. *Board size* is the number of directors on the board. *Board independence* is the percentage of independent outside directors on the board. *% directors w. finance background* is the percentage of directors with experience (present or past) as an executive officer in a bank or insurance company. *Institutional shareholdings* is the percentage of a bank's shares owned by large shareholders with ownership stakes of ≥ 5%. *Market-to-book ratio* is the market value of equity divided by book value of equity, *Tier 1 capital ratio* is the ratio of tier 1 capital to total risk-weighted assets, *Deposits/assets* is the ratio of deposits to total assets, and *Loans/assets* is the ratio of loans to total assets. Panel B additionally includes the following variables: *Nr. of meetings of the risk committee* is the number of times the risk committee of the respective banks met in 2006. *% of independent directors in risk committee* is the percentage of independent directors in the risk committee. Note that the three variables related to the risk committee are reported for the 22 banks in the smaller sample which do have a risk committee. The variables in all other banks are set equal to zero. *CRO reports to board* and *CRO reports to CEO,* are dummy variables which are equal to one if the CRO directly reports to the board of directors or to the CEO, respectively. *G-Index* is the governance index of Gompers, Ishii, and Metric (2003) which comprises 24 anti-takeover provisions. *Independent nominating committee* is a dummy variable which equals one if the bank's nominating committee is exclusively comprised of independent directors. *Combined CEO/chair* is a dummy variable whether CEO is also the chairman of the board of directors. *% of directors joining board before CEO* is the fraction of the board which predates the appointment of the current CEO. *% of directors older than 72* is the fraction of directors on the board that is older than 72. *Director non-attendance* is defined as the percentage of directors who attend less than 75% of board meetings. *Busy board* is a dummy variable whether a majority of outside directors holds three or more directorships. *USD CEO ownership* is the dollar value of all equity and option holdings of the CEO.

Panel A: Large sample	Mean	Minimum	Lower Quartile	Median	Upper Quartile	Maximum	Standard Deviation	N
Buy-and-hold returns	0.6199	0.0454	0.3456	0.5715	0.8888	1.6225	0.3553	372
Buy-and-hold returns (lagged)	1.1600	0.7390	1.0075	1.1317	1.2760	1.8801	0.2124	372
ROA	0.0074	-0.0771	0.0025	0.0121	0.0192	0.0348	0.0191	372
ROA (lagged)	0.0099	-0.0040	0.0072	0.0099	0.0126	0.0207	0.0043	372
ROE	0.0843	-0.7658	0.0225	0.1330	0.2138	0.4236	0.2041	372
ROE (lagged)	0.1087	-0.0464	0.0776	0.1117	0.1376	0.2405	0.0479	372
CRO in executive board	0.1263	0.0000	0.0000	0.0000	0.0000	1.0000	0.3327	372
Risk committee	0.0806	0.0000	0.0000	0.0000	0.0000	1.0000	0.2727	372
Board size	10.7661	5.0000	9.0000	10.000	13.0000	23.0000	3.1787	372
Board independence	0.7752	0.3750	0.7000	0.7857	0.8750	1.0000	0.1114	372
% directors w. finance background	0.2247	0.0000	0.1429	0.2000	0.2857	0.7500	0.1158	372
Institutional shareholdings	0.2991	0.0002	0.1170	0.2500	0.4667	0.9397	0.2252	372
Market-to-book ratio	1.8862	0.6464	1.4371	1.7917	2.2317	3.8823	0.6029	372
Total assets	17,805	168	696	1,272	3,441	1,459,737	113'412	372
Tier 1 capital ratio	0.1134	0.0624	0.0934	0.1074	0.1258	0.2304	0.0303	372
Deposits/assets	0.7391	0.4048	0.6879	0.7517	0.8068	0.8937	0.0939	372
Loans/assets	0.6969	0.2477	0.6399	0.7129	0.7788	0.9192	0.1239	372
Income diversity	0.5795	0.3295	0.5101	0.5728	0.6342	0.9934	0.1094	372

Panel B: Small sample	Mean	Minimum	Lower Quartile	Median	Upper Quartile	Maximum	Standard Deviation	N
Buy-and-hold returns	0.7397	0.0600	0.4244	0.7281	1.0102	1.3607	0.3476	85
Buy-and-hold returns (lagged)	1.1221	0.7404	1.0089	1.1100	1.2147	1.5867	0.1686	85
ROA	0.0106	-0.0667	0.0048	0.0169	0.0222	0.0348	0.0198	85
ROA (lagged)	0.0120	0.0024	0.0093	0.0118	0.0145	0.0207	0.0039	85
ROE	0.1066	-0.6054	0.0479	0.1733	0.2494	0.4236	0.2224	85
ROE (lagged)	0.1293	0.0293	0.0929	0.1247	0.1530	0.2405	0.0482	85
CRO in executive board	0.3647	0.0000	0.0000	0.0000	1.0000	1.0000	0.4842	85
Risk committee	0.2353	0.0000	0.0000	0.0000	0.0000	1.0000	0.4267	85
Nr. of meetings of the risk committee	4.1364	0.0000	0.0000	4.0000	7.0000	9.0000	3.2410	85
% of indep. directors in risk committee	0.5644	0.0000	0.0000	0.7917	1.0000	1.0000	0.4542	85
Nr. of directors in risk committee	3.8182	3.0000	3.0000	3.0000	5.0000	6.0000	2.3429	85
CRO reports to board	0.0824	0.0000	0.0000	0.0000	0.0000	1.0000	0.2765	85
CRO reports to CEO	0.0706	0.0000	0.0000	0.0000	0.0000	1.0000	0.2577	85
Board size	12.8909	7.0000	10.0000	13.000	15.0000	20.0000	3.0903	85
Board independence	0.7785	0.3750	0.7059	0.7857	0.8571	0.9333	0.1027	85
% directors w. finance background	0.2249	0.0556	0.1333	0.1818	0.2857	0.7500	0.1334	85
Institutional shareholdings	0.5287	0.0416	0.4009	0.5483	0.6592	0.9397	0.2012	85
G-Index	9.6747	3.0000	8.0000	10.0000	12.0000	15.0000	2.8504	85
Independent nominating committee	0.7636	0.0000	1.0000	1.0000	1.0000	1.0000	0.4288	55
Combined CEO/Chair	0.7636	0.0000	1.0000	1.0000	1.0000	1.0000	0.4288	55
% of directors joining board before CEO	0.4379	0.0000	0.1111	0.4000	0.6667	1.0000	0.3423	55
% of directors older than 72	0.0856	0.0000	0.0000	0.0000	0.1500	0.5300	0.1306	55
Director non-attendance	0.0123	0.0000	0.0000	0.0000	0.0000	0.2000	0.0364	55
Busy board	0.0727	0.0000	0.0000	0.0000	0.0000	1.0000	0.2621	55
USD CEO ownership	41,900,000	347,483	4,861,831	20,000,000	41,300,000	282,000,000	63,000,000	69
Market-to-book ratio	2.1216	1.1249	1.6282	2.0019	2.4160	3.7329	0.6154	85
Total assets	63,058	2,047	6,008	10,058	28,482	1,459,737	218'997	85
Tier 1 capital ratio	0.1013	0.0637	0.0870	0.0980	0.1125	0.1620	0.0197	85
Deposits/assets	0.6945	0.4048	0.6475	0.7044	0.7648	0.8855	0.1019	85
Loans/assets	0.6462	0.2477	0.5898	0.6708	0.7255	0.8579	0.1219	85
Income diversity	0.6311	0.3504	0.5496	0.6191	0.7000	0.9934	0.1235	85

Table 2: Regressions of buy-and-hold returns on corporate governance variables

The table reports the results from OLS regressions of *Buy-and-hold returns* on alternative sets of risk and corporate governance variables and control variables. *Buy-and-hold returns* are the banks' stock returns over the 18-month period from July 2007 to December 2008. *Buy-and-hold returns (lagged)* are the banks' stock returns over the 18-month period from July 2005 to December 2006. Variable definitions are provided in Table 1. *t*-statistics are reported in parentheses. ***, **, * denotes statistical significance at the 1%, 5%, 10% level.

Dependent variable: *Buy-and-hold returns* (from July 1, 2007, to December 31, 2008)

	(1)		(2)		(3)		(4)		(5)		(6)	
Constant	1.190	***	2.504	***	2.417	**	2.514	**	2.896	***	1.886	
	(3.064)		(2.786)		(2.427)		(2.136)		(2.750)		(1.495)	
CRO in executive board	-0.024		-0.071		-0.052		-0.047		-0.095		-0.077	
	(-0.423)		(-1.145)		(-0.576)		(-0.525)		(-1.321)		(-0.819)	
Risk committee	-0.093		0.076		0.100		0.101		-0.010		0.050	
	(-1.190)		(0.968)		(0.912)		(0.866)		(-0.103)		(0.402)	
Ln(Board size)	0.214	***	0.293	**	0.327	*	0.248		0.377	**	0.256	*
	(3.167)		(2.061)		(1.848)		(1.554)		(2.171)		(1.674)	
Board Independence	-0.321	*	-0.536		-1.400	***	-1.275	***	-0.844		-1.108	**
	(-1.792)		(-1.016)		(-3.267)		(-2.873)		(-1.552)		(-2.468)	
% directors w. finance background	-0.378	**	-0.295		-1.027	**	-1.161	**	-0.203		-1.055	*
	(-2.328)		(-0.820)		(-2.245)		(-2.311)		(-0.436)		(-1.987)	
Institutional shareholdings	-0.242	**	-0.466	**	-0.237		-0.166		-0.352	*	-0.195	
	(-2.427)		(-2.252)		(-0.591)		(-0.420)		(-1.662)		(-0.469)	
G-Index			-0.009				0.011				0.016	
			(-0.777)				(0.661)				(0.986)	
Independent nominating committee					0.161		0.091				0.097	
					(1.167)		(0.620)				(0.660)	
Combined CEO/Chair					-0.004		-0.079				-0.046	
					(-0.025)		(-0.497)				(-0.286)	
% of directors joining board before CEO					-0.005		0.033				0.005	
					(-0.035)		(0.186)				(0.026)	
% of directors older than 72					0.415		0.315				0.424	
					(1.341)		(0.711)				(0.847)	
Director non-attendance					-1.860		-1.615				-1.509	
					(-1.430)		(-1.124)				(-0.991)	
Busy board					-0.066		-0.010				-0.034	
					(-0.389)		(-0.059)				(-0.183)	
Ln(USD CEO ownership)									-0.037		0.002	
									(-1.206)		(0.057)	
Buy-and-hold returns (lagged)	-0.275	***	0.312		0.499		0.567		-0.205		0.648	
	(-3.453)		(1.252)		(1.601)		(1.610)		(-0.872)		(1.580)	
Market-to-book ratio	0.154	***	0.127	**	0.139	*	0.144		0.123		0.140	
	(4.863)		(2.109)		(1.693)		(1.555)		(1.570)		(1.453)	
Ln(Total assets)	0.018		-0.103	**	-0.098	*	-0.111	**	-0.048		-0.094	
	(0.827)		(-2.385)		(-1.906)		(-2.050)		(-0.944)		(-1.277)	
Tier 1 capital ratio	0.835		1.773		0.027		-0.154		0.692		-1.288	
	(1.327)		(0.788)		(0.007)		(-0.041)		(0.247)		(-0.332)	
Deposits/assets	-0.118		-0.678		-0.494		-0.500		-0.055		-0.225	
	(-0.513)		(-1.275)		(-0.656)		(-0.540)		(-0.080)		(-0.227)	
Loans/assets	-0.909	***	-0.730	**	-0.858	**	-0.717	*	-1.383	***	-0.712	*
	(-6.188)		(-2.470)		(-2.375)		(-1.858)		(-4.165)		(-1.820)	
Income diversity	-0.232		-0.845	**	-0.656	*	-0.708		-0.511		-0.625	
	(-1.226)		(-2.301)		(-1.702)		(-1.391)		(-1.283)		(-1.149)	
Observations	372		86		61		56		79		55	
R-squared	0.257		0.477		0.545		0.594		0.416		0.584	

Table 3: Regressions of buy-and-hold returns on extended set of corporate and risk governance variables

The table reports the results from OLS regressions of *Buy-and-hold returns* on alternative sets of risk and corporate governance variables and control variables. *Buy-and-hold returns* are the banks' stock returns over the 18-month period from July 2007 to December 2008. *Buy-and-hold returns (lagged)* are the banks' stock returns over the 18-month period from July 2005 to December 2006. Variable definitions are provided in Table 1. *t*-statistics are reported in parentheses. ***, **, * denotes statistical significance at the 1%, 5%, 10% level.

Dependent variable*: Buy-and-hold returns* (from July 1, 2007, to December 31, 2008)

	(1)		(2)		(3)		(4)		(5)		(6)	
Constant	1.314		1.561	*	1.776		1.542		0.888		1.162	
	(1.531)		(1.821)		(1.566)		(1.055)		(0.882)		(0.727)	
CRO in executive board	-0.035		-0.008		0.060		0.053		-0.052		0.049	
	(-0.553)		(-0.129)		(0.532)		(0.450)		(-0.645)		(0.390)	
Risk committee	-0.315	**	-0.354	***	-0.284		-0.249		-0.268		-0.206	
	(-2.603)		(-2.816)		(-1.022)		(-0.858)		(-1.418)		(-0.659)	
Nr. of meetings of the risk committee	0.047	**	0.056	**	0.065		0.060		0.043		0.053	
	(2.350)		(2.588)		(1.630)		(1.438)		(1.593)		(1.190)	
Nr. of directors in risk committee	0.019		0.021		0.029		0.028		0.022		0.032	
	(0.839)		(0.915)		(0.768)		(0.685)		(0.778)		(0.752)	
% of indep. directors in risk committee	-0.079		-0.099		-0.374		-0.370		-0.092		-0.353	
	(-0.794)		(-0.984)		(-1.642)		(-1.544)		(-0.639)		(-1.437)	
CRO reports to board	0.244	***	0.255	***	0.330	**	0.317	**	0.301	***	0.385	**
	(2.826)		(2.911)		(2.350)		(2.181)		(2.681)		(2.331)	
CRO reports to CEO	-0.281	*	-0.318	**	-0.366	**	-0.344	*	-0.326	*	-0.359	*
	(-1.943)		(-2.197)		(-2.185)		(-1.756)		(-1.868)		(-1.796)	
Ln(Board size)	0.236	*	0.268	*	0.375	*	0.391	*	0.283	*	0.434	**
	(1.708)		(1.879)		(1.907)		(1.987)		(1.860)		(2.166)	
Board Independence	-0.042		-0.050		-1.221	***	-1.290	**	0.181		-1.077	**
	(-0.086)		(-0.100)		(-2.808)		(-2.672)		(0.281)		(-2.225)	
% directors w. finance background	-0.128		-0.148		-1.099	**	-1.172	**	-0.184		-1.124	*
	(-0.401)		(-0.445)		(-2.267)		(-2.163)		(-0.462)		(-1.936)	
Institutional shareholdings	-0.706	***	-0.665	***	-0.025		0.013		-0.780	***	-0.031	
	(-4.304)		(-3.636)		(-0.054)		(0.027)		(-2.947)		(-0.064)	
G-Index			-0.005				0.012				0.017	
			(-0.517)				(0.599)				(0.864)	
Independent nominating committee					0.117		0.117				0.052	
					(0.691)		(0.714)				(0.329)	
Combined CEO/Chair					-0.063		-0.073				-0.099	
					(-0.387)		(-0.413)				(-0.534)	
% of directors joining board before CEO					0.107		0.084				0.058	
					(0.566)		(0.415)				(0.271)	
% of directors older than 72					0.398		0.473				0.405	
					(0.852)		(0.961)				(0.711)	
Director non-attendance					-2.881	*	-3.079				-2.785	
					(-1.901)		(-1.446)				(-1.274)	
Busy board					0.258		0.269				0.301	
					(1.694)		(1.616)				(1.419)	
Ln(USD CEO ownership)									0.034		0.034	
									(0.999)		(0.685)	
Buy-and-hold returns (lagged)	0.320		0.201		0.191		0.270		0.394		0.465	
	(1.511)		(0.870)		(0.462)		(0.585)		(1.426)		(1.034)	
Market-to-book ratio	0.118	*	0.132	**	0.077		0.086		0.143	*	0.092	
	(1.932)		(2.131)		(0.882)		(0.916)		(1.766)		(0.931)	
Ln(Total assets)	-0.063		-0.061		-0.076		-0.074		-0.087		-0.111	
	(-1.279)		(-1.202)		(-1.215)		(-1.152)		(-1.446)		(-1.094)	
Tier 1 capital ratio	3.464		3.312		-0.840		-0.894		2.161		-2.747	
	(1.497)		(1.398)		(-0.196)		(-0.205)		(0.700)		(-0.623)	
Deposits/assets	-0.641		-0.756		0.082		0.117		-0.752		0.078	
	(-1.432)		(-1.617)		(0.091)		(0.115)		(-1.318)		(0.070)	

Loans/assets	-0.442	-0.504	-0.678 *	-0.666 *	-0.499	-0.678 *
	(-1.395)	(-1.622)	(-1.999)	(-1.866)	(-1.404)	(-1.737)
Income diversity	-0.531	-0.647 *	-0.401	-0.433	-0.611	-0.562
	(-1.494)	(-1.734)	(-0.734)	(-0.721)	(-1.486)	(-0.904)
Observations	85	85	55	54	69	54
R-squared	0.541	0.547	0.618	0.621	0.510	0.620

Table 4: Regressions of ROA and ROE on extended set of corporate and risk governance variables
The table reports the results from OLS regressions of ROA (Columns 1 to 3) and ROE (Columns 4 to 6) on alternative sets of risk and corporate governance variables and control variables. *ROA* is the banks' cumulative net income over the years 2007 and 2008, divided by total assets as of year end 2006. *ROA (lagged)* is the banks' net income divided by total assets, both variables as of year end 2006. *ROE* is the banks' cumulative net income over the years 2007 and 2008, divided by the book value of equity as of year end 2006. *ROE (lagged)* is the banks' net income divided by the book value of equity, both variables as of year end 2006. Variable definitions are provided in Table 1. *t*-statistics are reported in parentheses. ***, **, * denotes statistical significance at the 1%, 5%, 10% level.

Dependent variable:	*ROA*						*ROE*					
	(1)		(2)		(3)		(4)		(5)		(6)	
Constant	0.020		0.010		0.053		-0.390		-0.480		0.002	
	(0.303)		(0.158)		(0.633)		(-0.617)		(-0.770)		(0.002)	
CRO in executive board	0.001		0.000		-0.001		0.012		0.010		-0.012	
	(0.194)		(0.044)		(-0.194)		(0.292)		(0.225)		(-0.232)	
Risk committee	-0.026	***	-0.025	***	-0.024	*	-0.289	***	-0.288	***	-0.265	*
	(-3.014)		(-2.915)		(-1.825)		(-3.148)		(-3.037)		(-1.909)	
Nr. of meetings of the risk committee	0.004	***	0.004	**	0.003	*	0.043	***	0.042	***	0.039	*
	(2.833)		(2.628)		(1.749)		(3.097)		(2.806)		(1.960)	
Nr. of directors in risk committee	0.004	***	0.004	***	0.004	**	0.042	***	0.041	***	0.043	**
	(3.195)		(2.904)		(2.234)		(3.166)		(2.810)		(2.132)	
% of indep. directors in risk committee	-0.013	**	-0.012		-0.011		-0.126	*	-0.113		-0.108	
	(-2.017)		(-1.602)		(-1.113)		(-1.736)		(-1.410)		(-0.932)	
CRO reports to board	0.008	*	0.008	*	0.007	*	0.105	**	0.102	**	0.082	*
	(1.705)		(1.659)		(1.730)		(2.242)		(2.062)		(1.827)	
CRO reports to CEO	-0.017	**	-0.016	*	-0.017	*	-0.181	**	-0.182	**	-0.169	*
	(-2.044)		(-1.992)		(-1.652)		(-2.182)		(-2.108)		(-1.720)	
Ln(Board size)	0.011		0.011		0.006		0.146		0.141		0.088	
	(0.998)		(0.961)		(0.540)		(1.335)		(1.263)		(0.733)	
Board Independence	-0.011		-0.007		-0.011		0.047		0.089		-0.005	
	(-0.318)		(-0.203)		(-0.275)		(0.129)		(0.250)		(-0.011)	
% directors w. finance background	-0.021		-0.016		-0.026		-0.089		-0.043		-0.132	
	(-0.645)		(-0.494)		(-0.733)		(-0.290)		(-0.142)		(-0.389)	
Institutional shareholdings	-0.019	*	-0.023	*	-0.022		-0.210	*	-0.255	*	-0.230	
	(-1.773)		(-1.960)		(-1.343)		(-1.750)		(-1.859)		(-1.226)	
G-Index			0.000						0.005			
			(0.416)						(0.663)			
Ln(USD CEO ownership)					-0.001						-0.019	
					(-0.398)						(-0.779)	
ROA (lagged)	0.651		0.631		0.574							
	(0.892)		(0.871)		(0.725)							
ROE (lagged)							-0.175		-0.197		-0.520	
							(-0.221)		(-0.249)		(-0.606)	
Buy-and-hold returns (lagged)	0.015		0.012		0.021		0.099		0.062		0.167	
	(0.971)		(0.793)		(1.040)		(0.643)		(0.393)		(0.817)	
Market-to-book ratio	0.009	*	0.009	*	0.012	**	0.172	**	0.178	**	0.227	***
	(1.715)		(1.801)		(2.130)		(2.517)		(2.649)		(3.274)	
Ln(Total assets)	0.002		0.002		0.002		0.039	*	0.048	*	0.054	
	(0.842)		(1.123)		(0.652)		(1.751)		(1.950)		(1.536)	
Tier 1 capital ratio	0.088		0.079		0.052		1.872		1.841		1.654	
	(0.797)		(0.698)		(0.313)		(1.574)		(1.520)		(1.012)	
Deposits/assets	-0.027		-0.022		-0.042		-0.167		-0.135		-0.288	
	(-0.888)		(-0.714)		(-1.213)		(-0.548)		(-0.426)		(-0.903)	
Loans/assets	-0.035		-0.036		-0.039		-0.368	*	-0.392	*	-0.397	*
	(-1.648)		(-1.629)		(-1.595)		(-1.731)		(-1.730)		(-1.748)	
Income diversity	-0.061	***	-0.063	***	-0.066	***	-0.699	***	-0.743	***	-0.756	***
	(-2.813)		(-2.710)		(-3.066)		(-3.130)		(-3.050)		(-3.451)	
Observations	85		85		69		85		85		69	
R-squared	0.488		0.492		0.524		0.549		0.556		0.590	