Corporate Governance in the 2007-2008 Financial Crisis: Evidence from Financial Institutions Worldwide

by

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Abstract

This paper investigates the role of corporate governance in the 2007-2008 credit crisis, using a unique dataset of 306 financial firms from 31 countries that were at the center of the crisis. We find that CEOs were more likely to be replaced following large losses if firms had more independent boards, higher institutional ownership, and lower insider ownership. In addition, consistent with the notion that the crisis is partially attributable to pressure for short-term results from outside board members and investors, we find that firms with more independent boards and institutional ownership experienced larger losses during the crisis, and that firms with more institutional ownership took more risk before the crisis. Moreover, we find that firms that used CEO compensation contracts with a heavier emphasis on annual bonuses (as opposed to equity-based compensation) experienced larger losses during the crisis and took more risk before the crisis. Overall, our findings suggest that while governance is positively associated with the disciplining of executives for losses incurred during the crisis period, it did not prevent these losses, but instead exacerbated them by encouraging executives to focus on short-term performance.

1. Introduction

An unprecedented large number of financial institutions have collapsed or were bailed out by governments worldwide since the onset of the global financial crisis in 2007.[1] Many observers attribute these events to failures in corporate governance, such as lax board oversight and flawed executive compensation practices that encouraged aggressive risk taking. For example, Kashyap, Rajan, and Stein (2008) argue that while the failure to offload subprime risk has resulted in the credit crisis, the root cause of the crisis lies in the breakdown of shareholder monitoring and ill conceived managerial incentives. While governance reforms are being considered to restore the stability of global financial systems, there is little empirical evidence on whether governance mechanisms indeed failed in financial institutions.[2] The purpose of this paper is to empirically examine the role of corporate governance in the disciplining of CEOs for the losses during the crisis, as well as its role on risk taking by financial institutions before the crisis.

We argue that the focus of independent boards and institutional investors on short-term profitability has not only led to the replacement of poorly performing CEOs during the crisis, but has also encouraged risk taking of firms before the crisis, which exacerbated the losses suffered during the crisis. Prior literature suggests that CEO turnover is more sensitive to shareholder losses for firms with greater board independence and larger institutional ownership (as opposed to insider ownership) because these external monitors' fiduciary duty is to focus on the creation of shareholder

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[1] The list of casualties includes Bear Stearns, Citigroup, Lehman Brothers, Merrill Lynch (in the U.S.), HBOS and RBS (in the U.K.), and Dexia, Fortis, Hypo Real Estate and UBS (in continental Europe). See Brunnermeier (2009) for a detailed account of the 2007-2008 crisis.

[2] See "SEC to examine boards' role in financial crisis" (*Washington Post*, February 20, 2009), "Fed chief calls for scrutiny of executive pay policies" (*New York Times*, March 21, 2009)

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value (e.g., Weisbach 1988; Volpin, 2002; Parrino, Sias and Starks, 2003). However, recent studies argue that pressure from boards and investors, in particular institutional investors, for short-term profitability encourages managers to sacrifice long-term investments (such as R&D) to meet short-term earnings targets (e.g., Bushee, 1998). If pressure from boards and investors for short-term performance has induced managers of financial firms to investment in risky assets, such as subprime mortgages, we expect firms with more independent boards and institutional ownership (as opposed to insider ownership) to have suffered larger losses during the crisis, and to have taken more risk in the period leading up to the crisis.

In addition, we argue that compensation contracts with a heavier emphasis on annual bonuses (as opposed to equity-based compensation) encourage executives to focus on short-term results. If annual bonuses have encouraged managers of financial firms to invest in risky assets, we expect firms with CEO compensation contracts that rely more on annual bonuses (as opposed to equity grants) to have suffered larger losses during the crisis and to have taken more risk before the crisis.

Our sample comprises 306 publicly-listed financial firms from 31 countries for which we gather unique data on CEO turnover, board composition, ownership structure, CEO compensation, and accounting writedowns surrounding the 2007-2008 crisis. We focus our analysis on the largest financial firms worldwide because the crisis had a global scale and affected financial firms across many countries with diverse governance arrangements. For example, the majority of publicly-listed financial firms in the U.S. are widely held whereas in continental Europe many companies are closely held. Our sample also offers a unique laboratory setting to test the role of corporate governance

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mechanisms because the size and the source of the enormous shareholder losses are well documented and the actions of the boards and executives are heavily scrutinized.

We find that CEO replacements in financial institutions during the crisis period exceeded the norm. Figure 1 shows that financial firms exhibited higher CEO turnover rates than those of non-financial firms in the 2007-2008 crisis period, while in the 2004-2006 period the pattern was the opposite. Interestingly, there is a wide variation in CEO turnover rates across countries. Examples of CEO turnover include Citigroup, Merrill Lynch, and Wachovia (in the U.S.), UBS (in Switzerland), and IKB Deutsche Industriebank (in Germany). However, CEOs of many other firms suffering substantial losses maintained their positions.[3] For example, despite large losses none of the French firms in our sample replaced their CEO during the sample period.

To test our prediction on CEO turnover, we use a logit model regressing CEO turnover on shareholder losses, corporate governance, and a term interacting shareholder losses with corporate governance (Weisbach, 1988). We use three variables to proxy for shareholder losses (accounting writedowns, new capital raisings, and cumulative stock returns) and focus on three corporate governance mechanisms (board independence, institutional ownership, and ownership by corporate insiders). We measure corporate governance factors as of December 2006 (i.e., pre-crisis) and shareholder losses from the first quarter of 2007 until the earlier of the end of the quarter in which the CEO is replaced, or the end of our sample period (third quarter of 2008). Consistent with our prediction, we find that CEO turnover is more sensitive to shareholder losses for firms with more independent boards, larger institutional ownership, and smaller insider ownership.

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[3] See Hall of shame" (*The Economist*, August 7, 2008).

Next, we test our predictions on the relation between corporate governance and risk taking. Specifically, we regress shareholder losses and risk taking on board independence, institutional ownership, and ownership by corporate insiders. We use firms' equity-to-assets ratios, and expected default frequencies (EDF) as measures of risk taking. Consistent with our predictions, we find that board independence and institutional ownership (but not insider ownership) are associated with larger losses during the crisis. In addition, we find that firms with higher institutional ownership have higher expected default risk. However, contrary to our prediction, we find that firms with more independent boards have higher equity-to-assets ratios.

Finally, we examine our predictions on CEO pay by regressing shareholder losses and risk taking on the structure of CEO pay. We measure bonus pay as a CEO's annual bonus scaled by the sum of salary and other annual compensation, and equity-based compensation as the sum of restricted shares, long-term incentive plans (LTIP), and stock option awards scaled by the sum of salary and other annual compensation. Consistent with our predictions, we find that while bonus pay is associated with larger losses during the crisis, and more risk taking before the crisis, equity-based compensation is associated with smaller losses and less risk taking.

Taken together, these results are consistent with pressure from institutional investors for short-term performance and bonus plans (as opposed to long-term incentives) having induced corporate managers to increase risk taking, thereby resulting in larger losses during the crisis period. In addition, while independent directors appear to have been successful in curbing risk taking observable to market participants, they seem to have been unsuccessful in reducing, and appear to even have encouraged, investments in the

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types of assets that are the underlying source of the financial crisis (e.g., mortgage-backed securities).

Although not the main focus of our paper, we also examine whether losses during the crisis had negative repercussions for independent board members. Consistent with independent directors being held accountable for the losses, we find that independent directors at firms that experienced larger losses are more likely to leave their boards, in particular when they are responsible for overseeing risk management. Moreover, consistent with institutional investors playing a disciplinary role in director turnover, we find that the director turnover-performance sensitivity is higher for firms with greater institutional ownership.

Our paper adds to the current debate on the regulatory reform of financial institutions and contributes to the literature on international corporate governance in two important ways. First, our study provides a timely investigation of a momentous economic event (Gorton, 2008). To our knowledge, ours is the first study that examines the role of corporate governance and CEO pay structures in the 2007-2008 financial crisis using a global sample. We take a comprehensive view on the role of corporate governance by examining both the disciplining of CEOs during the crisis and risk taking of firms prior to the crisis. In a contemporaneous study, Fahlenbrach and Stulz (2009) focus on the relation between CEO incentives and performance of U.S. banks during the crisis. Beltratti and Stulz (2009) use a sample of 98 banks from 20 countries, but examine only how various governance indices and bank regulation relate to bank performance during the crisis.

Second, our results contribute to the literature on the influence of corporate governance on financial institutions (Laeven and Levine, 2008; Mehran and Rosenberg, 2008) and the importance of market discipline as a complement to regulation (Flannery, 1998; Berger, Davies, and Flannery, 2000; Ashcraft, 2008). Prior studies on risk taking by financial institutions generally focus on only a subset of governance mechanisms and compensation structures examined in our study. For example, Laeven and Levine (2008) find that risk taking by banks is higher in those with large and diversified blockholders. Mehran and Rosenberg (2008) find that CEO stock option grants are associated with lower debt and higher capital ratios but riskier investments. In contrast, we also investigate other key governance and compensation attributes such as board independence, institutional ownership, and the use of bonus compensation.

The remainder of the study proceeds as follows. Section 2 presents our hypotheses on CEO turnover and firm risk taking. Section 3 describes the data. Section 4 reports the main results. Section 5 describes the results on turnover of independent directors. Section 6 concludes and discusses policy implications of our study.

2. Hypotheses

This section discusses our predictions on the role of corporate governance mechanisms in the credit crisis. We first posit our hypothesis on the termination of poorly performing CEOs during the crisis period. Based on prior literature, we expect CEO turnover to be more sensitive to shareholder losses for firms with greater board independence (Weisbach, 1988) and larger institutional ownership (Parrino, Sias and Starks, 2003), but less sensitive to shareholder losses for firms with larger insider ownership (Volpin, 2002). This is because independent boards and institutional investors

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should focus on shareholder returns and be more willing to challenge the CEO in light of company losses, and remove the CEO if necessary. Institutional investors can exercise their influence on corporate decisions through direct activism (Gillan and Starks, 2007) or indirect discipline by "voting with their feet" (Parrino, Sias and Starks, 2003). In contrast, insider blockholders likely enjoy large private benefits of control, participate in management, or make top managers more entrenched (LaPorta, Lopez-de-Silanes, and Shleifer, 1999; Denis and McConnell, 2003). For example, Volpin (2002) finds that top management performance turnover sensitivity is the lowest when control is in the hands of one shareholder. Consequently, we test the following hypothesis:

H1 (CEO Turnover): CEO turnover is more sensitive to poor performance for firms with more independent boards of directors and larger institutional ownership. CEO turnover is less sensitive to poor performance for firms with greater insider ownership.

Next, we consider the influence of corporate governance mechanisms on risk taking by financial firms in the period leading up to the crisis. Critics often argue that pressure from boards and investors, in particular institutional investors, induced firms to focus on short-term profitability, and as a result motivated managers to increase their investment in risky assets such as subprime mortgages which subsequently lead to large losses. Bushee (1998) suggest that short-term oriented institutional investors may encourage managers to sacrifice long-term investments (such as R&D) to meet short-term earnings targets. Since shareholders hold a call option on firm assets, companies with more independent boards and higher institutional ownership may be more likely to react to

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investor pressure by taking greater risks to increase profits (Jensen and Meckling, 1976).[4]

Similarly, John, Saunders and Senbet (2000) suggest that risk taking may be optimal for

bank shareholders because of the put option granted to banks by governmental deposit

insurance. In contrast, since corporate insiders, such as controlling families, tend to be

more risk averse (because they are less diversified by holding a large fraction of their

wealth in the firm), firms with larger insider ownership may be less inclined to take large

risks.

*H2a (**Corporate governance and ex-post losses**): Shareholder losses are larger for firms
with more independent boards and greater institutional ownership, and smaller for firms
with higher insider ownership.*

*H2b (**Corporate governance and ex-ante risk taking**): Risk taking is higher for firms
with more independent boards and greater institutional ownership, and lower for firms
with higher insider ownership.*

We note that our H2 hypotheses assume that corporate boards yield to investor

pressure for short-term profits. One countervailing argument to these hypotheses is that

board members, unlike institutional investors, are subject to threats of lawsuits and

reputational penalties if firms engage in excessive risk taking.

Finally, we draw on the literature on compensation of bank CEOs. Previous literature

has studied the effects of CEO pay on risk taking (Houston and James, 1995), bank

leverage (John and Qian, 2003), and bank performance (Hubbard and Palia, 1995). The

structure of compensation of CEOs is likely to also play a role on risk taking in our

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[4] Citigroup CEO Chuck Prince famously said "When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you've got to get up and dance. We're still dancing." (*Financial Times*, July 9, 2007)

context. Pay packages that rely more on bonus compensation may encourage executives to focus on short-term results and overlook potential long-term losses because bonuses are typically based on annual profit targets and paid in cash. In contrast, a greater use of equity compensation may not lead to greater risk taking because stock options or restricted shares can align incentives of executives with the long-term interest of shareholders. Although some studies argue that stock options increase management's willingness to take risk, Ross (2004) shows that this is generally not the case.

__H3a (Pay structure and ex-post losses)__: Shareholder losses are larger for firms with a greater reliance on bonus pay and smaller for firms with a greater reliance on equity compensation.

__H3b (Pay structure and ex-ante risk taking)__: Risk taking is higher for firms with a greater reliance on bonus pay and lower for firms with a greater reliance on equity compensation.

3. Data

3.1 Time line

We conduct our empirical analysis using data from January 2007 to September 2008. We begin our investigation period at the start of 2007 because this is generally regarded as the period when the market first realized the severity of the losses related to subprime mortgages (Ryan, 2008). We end our investigation period in the third quarter of 2008 for three main reasons: (1) The massive government bailouts were initiated from October 2008 onwards, therefore we examine CEO turnover over the prior period in which it is

driven mostly by internal corporate governance mechanisms.[5] (2) In October 2008, changes in the International Financial Reporting Standards (IFRS) allowed financial institutions to avoid recognizing asset writedowns.[6] (3) At the end of the third quarter of 2008, regulators in several countries imposed short-selling bans on the stocks of many financial institutions.

3.2 Sample of financial firms

Our sample consists of 306 publicly-listed financial firms (banks, brokerage firms, and insurance companies) that were publicly listed at the end of December 2006 across 31 countries. We use the following three criteria to compile our sample. First, we require firms to be covered in the *Compustat/CRSP (North America)* or *Compustat Global* databases and have data on total assets, total shareholder's equity, earnings, and stock returns. Second, we limit our sample to firms that are covered by the *BoardEx* database. Third, we restrict our sample to firms from industries that are covered by Bloomberg and with total assets greater than US $10 billion because Bloomberg limits its coverage to firms with cumulative writedowns exceeding US $100 million. Due to its special coverage on the financial crisis, Bloomberg (WDCI menu) collected data on accounting writedowns and new capital raisings during the crisis period.

3.3 Main variables

We now discuss our key variables of interest. Appendix A provides definitions of all variables used in our empirical analysis.

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[5] For example, the Troubled Asset Relief Program (TARP) was signed in October 2008. In some cases, governments insist on changes in top management as a condition for a company to receive a government bailout. See "RBS chiefs to be forced out under bailout deal" (*Telegraph*, October 8, 2008).
[6] The International Accounting Standards Board (IASB) issued amendments to the use of fair value accounting on financial instruments in October 2008 that allow companies to reclassify financial assets from market value based to historical cost based valuation.

Measuring CEO turnover

We use biographic information on individual executives from *BoardEx* to determine the identity of the CEO for each firm. *BoardEx* contains detailed biographic information on individual executives and board members of approximately 12,000 publicly listed firms in nearly 50 countries and its coverage for international firms is unparalleled by any other data provider. Following DeFond and Hung (2004) and Fernandes, Ferreira, Matos, and Murphy (2008), we use the term "CEO" (Chief Executive Officer) to refer to the top executive of financial institutions, even though firms in some countries tend to use other titles (such as "managing director" or "chairman of the management board"). To ensure that we selected the top executive for each firm, we verified the data in *BoardEx* using annual reports and other company reports obtained from *Mergent Online*.

We code a firm as having experienced CEO turnover if the top executive left the firm during the period January 2007 to December 2008.[7,8] We exclude 21 cases in which the CEO remained at the firm until the firm delisted, because it is not clear whether these observations should be coded as turnover or non-turnover cases. Thus our final sample for the CEO turnover tests consists of 285 firms.

Appendix B provides details on CEO information for the top ten financial firms (in terms of assets) from five sample countries (U.S., U.K., Germany, Switzerland, and France). It shows that six CEOs of the top ten financial firms in the U.S. were replaced during the sample period – namely, the CEOs of Citigroup, AIG, Fannie Mae, Merrill

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[7] We extend the period in which we measure CEO replacements to the end of 2008 because there may be a lag between the announcement of accounting writedowns and CEO turnover.
[8] We use executive departures as an indicator of CEO turnover, instead of CEO role changes, because we believe this to be a less ambiguous measure of forced turnover. In fact, 73% of the executives that lost the top positions also left the firm during our measurement period.

Lynch, Freddie Mac, and Wachovia. In contrast, Appendix B shows there is no recorded CEO turnover among the top ten firms in France during this period.

Measuring shareholder losses

A unique feature of our setting is that losses of financial firms are well publicized during the crisis period. We use three variables to capture shareholder losses: (1) cumulative accounting writedowns scaled by total assets, (2) capital raisings, a dummy variable that equals 1 when a firm raised new capital (including both equity and debt securities), and 0 otherwise, and (3) cumulative stock returns. We measure these variables from the first quarter of 2007 until the earlier of the quarter in which the CEO leaves the firm, or the third quarter of 2008. Our data source for accounting writedowns and new capital raisings is the Bloomberg WDCI menu and it covers financial firms, namely banks, brokers, insurance companies, and government sponsored entities (Freddie Mac and Fannie Mae). Bloomberg collects the writedown data from regulatory filings, news articles, and company press releases (such as quarterly earnings announcements). We measure writedowns as negative figures so that the coefficients on this variable in our regressions can be compared to those on stock returns. Data on stock returns are from Compustat Global and CRSP. .

Figure 2 plots the magnitude of accounting writedowns (in US $billions) per quarter for all financial firms covered in Bloomberg. We break down writedowns into three categories: (1) losses related to mortgage-backed securities ("Mortgage-backed securities" – Bloomberg codes CDO, CMBS, MTGE, and SUB), (2) losses related to loan portfolios ("Loan portfolios" - COST), and (3) losses related to investments in other firms

("Investment in other firms" – CORP and OCI).[9] The figure shows a spike in writedowns related to mortgage-backed securities in the fourth quarter of 2007, followed later on by an increase in writedowns related to investment in other firms (such as in Lehman Brothers or in Icelandic banks). It also shows a steady increase in credit losses related to loan portfolios from the second quarter of 2007 to the third quarter of 2008.

Appendix B shows significant shareholder losses for top financial firms from several countries. For example, Citigroup had accounting writedowns totaling -3.6% of its assets (approximately $68 billion) and AIG had writedowns totaling -6.2% of its assets during our sample period.

There are advantages and disadvantages to the use of each of the loss measures. Accounting writedowns are potentially a direct measure of how severe the crisis has impacted the firm, but it is imperfect, because management has discretion over how much it recognizes in a period. Stock returns are a better measure in this respect as it captures the full extent to which the market believes the crisis has impacted shareholders. Unfortunately, stock returns have the disadvantage that these include the expectation of future events (such as government intervention) that may disguise the true cost of the crisis. Capital raisings are a good proxy for the extent of losses, in that the firm had a need to raise distressed capital. However, for these security issues to be successful new

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[9] The total magnitude of losses in all firms covered by Bloomberg is US $ 1,073 billion for the period from the first quarter of 2007 to the third quarter of 2008. Bloomberg classifies writedowns into various groups based on company disclosure. The top thirteen groups (in terms of total magnitude of writedowns) are: *ABS* - Non-mortgage asset-backed securities, *CDO* - Collateralized debt obligations, *CDS* - Credit default swaps, *CMBS* - Commercial mortgage-backed securities, *CORP* - Corporate investment, *COST* - Credit costs/ loan charge offs, *LEV* - leveraged loans, *MTGE* - Mortgage-related securities, *MONO* - Monolines, *OCI* - Revaluation reserve/ other comprehensive income, *RES* - Uncategorized residential mortgage asset writedowns, *SUB* - Subprime residential mortgage backed securities, and *TRA* - Trading losses. In Figure 2, under "Mortgage-backed Securities" we only include the four major groups that are likely to be most directly related to mortgage-backed securities (CDO, CMBS, MTGE, and SUB). However, Figure 2 is a conservative estimate of losses related to mortgage-backed securities because other groups (such as *CDS, RES,* and *TRA*) can also include writedowns related to mortgage-backed securities.

investors need to have confidence in a firm and therefore only firms with good prospects will successfully raise new capital. Consequently, capital raisings could be a sign of limited (but not insurmountable) losses. Given the pros and cons of each measure we conduct our analysis using all three measures.

Measuring ex-ante risk taking

As a measure of ex-ante risk taking, we use a firm's equity-to-assets ratio, measured as book value of equity divided by total assets as of December 2006 (i.e., prior to the crisis period). For banks, the equity-to-assets ratio represents the capital adequacy ratio, which is regulated and has been used by Laeven and Levine (2008) and others to capture banks' risk taking. The equity-to-assets ratio, a measure inversely related to leverage, is a key issue in the current debate on regulatory reform of financial institutions. The ratio is also relatively easy for independent directors and outside investors to monitor, which makes it well suited for testing our hypotheses related to risk taking. In contrast, it is much more difficult for external monitors to assess the actual risk associated with different types of assets the firm invests in (e.g., subprime mortgage versus commercial loans) or off-balance sheet items.[10]

Our second measure of risk taking is the estimate of default probability (Expected Default Frequency or EDF) produced by Moody's KMV CreditMonitor implementation of Merton's (1974) structural model. This measure uses equity market information to estimate the probability that a firm will default within one year, which in Moody's KMV

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[10] The equity-to-assets ratio may not reflect real business risk. Kashyap, Rajan, and Stein (2008) illustrate this argument with the case of traders that have incentives to write insurance on infrequent events, taking on what is termed "tail" risk, and treating the insurance premium as income, but not setting aside reserves for eventual payouts.

scale by construction ranges from 0.01% to 35%.[11] We measure EDF as of December 2006 and, following Covitz and Downing (2007), we use the log of EDF in our analysis. EDF is a forward looking measure but it is subject to the criticism that the market may have underestimated the extent of mortgage and subprime risks taken by financial firms before the crisis as evidenced by the sharp market correction that took place in 2007-2008.

Measuring corporate governance

We use three variables to capture corporate governance: (1) board independence, (2) institutional ownership, and (3) insider ownership. We measure these corporate governance mechanisms as of December 2006 (i.e., prior to the onset of the crisis).

We focus on board independence because this is one of the most extensively studied board characteristics (Denis and McConnell, 2002).[12] We define *Board independence* as the percentage of independent directors. Using *BoardEx* data, we classify directors as "independent" if they are non-executive directors (i.e. not full-time employees).

In addition, we focus on ownership structure because there is significant variation across and within countries (La Porta, Lopez-de-Silanes, and Shleifer, 1999). We measure *Institutional ownership* as the percentage of shares held by institutional money managers (e.g. mutual funds, pension plans, and bank trusts) using *FactSet/Lionshares* (Ferreira and Matos, 2008). We measure *Insider ownership* as the percentage of "closely held" shares in the hands of shareholders who hold over 5% of shares using

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[11] We thank Shisheng Qu at Moody's KMV for providing us the EDF data.
[12] While board size is another commonly studied board characteristic, we do not focus on this measure because board sizes differ considerably for regulatory reasons around the world. For example, board sizes are generally larger in Germany because firms are required to have a two-tiered board structure.

Datastream/Worldscope (Dahlquist, Pinkowitz, Stulz, and Williamson, 2003). Unfortunately, the data do not isolate equity ownership by executives or directors.

Appendix C provides examples of the corporate governance measures for top financial firms for five selected countries. There is significant variation in corporate governance among financial firms around the world. For example, Citigroup has mostly independent directors on its board (88% board independence) and is largely owned by institutional investors (84% institutional ownership). Crédit Agricole has a more independent board (96% board independence) but is largely owned by insiders (55% insider ownership).

Measuring CEO compensation structure

We examine the structure of compensation for the top executive (CEO) in each financial firm in our sample. We gather information on compensation structure for fiscal year 2006 from SEC filings for U.S. firms and *BoardEx* for non-U.S. firms. *BoardEx* provides detailed compensation data – including salaries, bonuses, payouts from long-term incentives plans, and option grants – for top executives in companies where such data are publicly disclosed. We supplement these data by manual collection from the annual reports as used in Fernandes, Ferreira, Matos, and Murphy (2008).

We measure CEO compensation structure as the relative importance of incentives versus fixed pay in a CEO's pay package. We define *Total incentives* as the ratio of the sum of annual bonus and equity grants (options, LTIP, and restricted shares) divided by the sum of salary and other annual compensation (e.g., pension benefits). We scale incentive pay by salary and other annual compensation because total compensation is not disclosed in many countries.

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We then use two variables to capture the type of incentives: (1) *Bonus*, defined as bonus scaled by the sum of salary and other annual compensation,[13] and (2) *Equity compensation*, defined as the sum of options, long-term incentive plans (LTIP), and restricted shares scaled by the sum of salary and other annual compensation.[14]

Appendix D provides examples of CEO compensation structures for the top financial firms in selected countries. It shows that bonus pay constitutes a significant portion of CEO compensation for many large financial firms. For example, the 2006 bonus for Citigroup's CEO (Chuck Prince III) is nine times larger than the sum of his salary and other compensation, and is larger than his equity grants in that year.

3.4 Summary statistics

Table 1 presents summary descriptive statistics by country. Panel A of Table 1 discloses the number of financial firms in our sample by geographic region. It shows that the sample of 306 firms is relatively balanced between U.S. (125) and European (137) firms, and also reports a few firms from other regions. In addition, the panel reports the frequency of CEO and director turnover, as well as average shareholder losses during the crisis period for our full sample. It shows that approximately 24% of our sample firms experienced CEO turnover and 24% of the directors in our sample left their firms. It also reports that both U.S. and European firms were significantly affected by accounting writedowns, although the average losses were substantially higher in the U.S. (at 4% of

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[13] In 2006, executive compensation disclosures changed for U.S. firms. Since the new disclosure rule does not require firms to disclose annual cash bonuses in a separate column of the executive compensation table, bonuses in 2006 data can include deferred compensation such as restricted shares, and long-term incentive plan payouts. To ensure that our bonus variable captures annual cash incentives (as is the case for most international firms), we examine the footnotes to the compensation tables for U.S. firms and classify bonus payouts in the form of deferred compensation (e.g., restricted shares) as equity compensation.

[14] Similar to stock options and restricted shares, LTIP plans are long-term oriented regardless of whether the payout is in cash or stock. Thus, we do not make a distinction between LTIP plans that pay out in cash and stocks, as in Fernandes, Ferreira, Matos, and Murphy (2008).

assets) than in Europe (only 1% of assets, on average). In addition, the panel shows that

firms in both regions had to resort to capital raisings. Finally, it shows a large decrease in

share prices affected financial firms in the U.S. (-32%) and Europe (-33%).

Panel B of Table 1 presents sample averages of the governance and compensation

variables per country. Consistent with Adams and Mehran (2003) and Adams (2009), we

find that the percentage of independent directors in U.S. financial firms is high (85%)

relative to other studies that have typically focused on manufacturing firms. In Europe,

board independence is generally lower. The panel also shows that while U.S. and

Canadian firms tend to have high institutional ownership and low insider ownership,

continental European firms tend to have low institutional ownership and high insider

ownership. In terms of CEO compensation, Panel B shows that CEO compensation in the

U.S. is much more tilted towards incentive pay than in other countries.

Panel A of Table 2 shows summary statistics for variables used in our main analysis.

Panel B of Table 2 reports the correlation matrix. The panel shows that our three proxies

of shareholder losses are all significantly correlated with each other. For example, stock

returns are positively associated with accounting writedowns and negatively associated

with the need to raise capital during the crisis period. Panel C of Table 2 provides

univariate tests of differences in average shareholder losses between financial firms that

experienced CEO turnover and those that did not. Although there is no difference in

average stock returns, firms with CEO turnover have significantly higher magnitudes of

accounting writedowns and more frequent capital raising activities than firms without

CEO turnover. This finding is consistent with prior literature that finds an inverse relation

between performance and CEO turnover (Barro and Barro, 1990; Houston and James, 1995; Hubbard and Palia, 1995).

4. Main analysis

4.1 Corporate governance mechanisms and the termination of poorly performing CEOs during the crisis period

As shown in Figure 1, there was a remarkable increase in CEO turnover for financial firms during the crisis period. To test our hypothesis on CEO turnover (H1), we examine the effect of corporate governance on CEO turnover-performance sensitivities. Following Weisbach (1988) and Lel and Miller (2008), we use a logit model regressing CEO turnover on shareholder losses, corporate governance, and a term interacting shareholder losses and corporate governance. Specifically, we run the following logit regression:

$$CEO\ turnover = \ \alpha_0 + \beta_1(Shareholder\ losses) + \beta_2(Corporate\ governance) +$$
$$\beta_3(Shareholder\ losses\ *\ Corporate\ governance) +$$
$$\beta_4(Age\ dummy) + \beta_5(Firm\ size) + \varepsilon \qquad (1)$$

The dependent variable is a binary variable equal to 1 if the CEO left the firm from January 2007 to December 2008 (i.e. during the crisis period). We use three variables to proxy for shareholder losses: cumulative accounting writedowns, capital raisings, and cumulative stock returns. These are all measured from the first quarter of 2007 until the earlier of the quarter of the CEO's departure or the third quarter of 2008 (the end of the sample period).[15] We measure the corporate governance factors as of December 2006, i.e. just prior to the start of our sample period. We include controls for CEO age (age

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[15] We use a different accumulation window for shareholder losses for each firm with CEO turnover because using the same accumulation window across all firms (from January 2007 to September 2008) would bias our results towards finding support for the prediction that corporate governance helps discipline poorly performing CEOs. This is because incoming CEOs are likely to be more aggressive with recognizing writedowns, right after they assume their new position.

dummy equal to one when the executive is 60 years and older, and zero otherwise) and firm size (natural log of total assets). In addition, we include dummy variables indicating country and industry membership (3-digit SIC) to ensure that our results are not driven by unobservable country and industry fixed effects. Finally, we use robust standard errors clustered by country in all our regression specifications.

Our main variables of interest are the interactions between shareholder losses and corporate governance. Because of the problems with interpreting interaction terms in non-linear models described by Ai and Norton (2003), we compute the corrected marginal effect for every observation and then report the average interactive effect and its significance.

Table 3 presents the results on the CEO turnover-performance analysis. Columns (1)-(3) show the baseline regression without interaction terms between shareholder losses and the governance factor. The results show that out of our three shareholder loss measures only the writedown measure is associated with an increased probability of CEO turnover. This suggests that accounting writedowns were linked to CEO dismissals irrespective of the corporate governance mechanisms in place.

Columns (4)-(6) show the regression models including interaction terms between shareholder losses and board independence. For the sake of clarity, we include the predicted signs of the coefficients on the interaction variables according to the H1 hypothesis. The average interactive effects between shareholder losses and board independence in columns (5) and (6) are significant and in the predicted direction, suggesting that more outsider-dominated boards fulfilled their duty of replacing

management for poor performance as measured by the need to raise external capital and the loss in market value during the crisis.

We next examine the role of ownership. Columns (7)-(9) of Table 3 show the regression models including interaction terms between shareholder losses and institutional ownership, whereas columns (10)-(12) show the models with interaction terms between shareholder losses and insider ownership. The average interactive effect is negative and significant in column (9), suggesting that CEO turnover is more sensitive to negative stock returns for firms with larger institutional ownership. In contrast, the average interactive effect is positive and significant in column (10), suggesting that CEO turnover is less sensitive to poor performance for firms with larger insider ownership.

Overall, our results are consistent with hypothesis H1 that predicts that corporate boards and institutional ownership, but not insider ownership, served as a disciplinary mechanism in terminating poorly performing CEOs during the crisis period. These findings are in line with Weisbach (1988) for the U.S., Dahya, McConnell, and Travlos (2002) for the U.K., and Renneboog (2000) for Belgium. However, they differ from other studies on CEO turnover for the U.K. (Franks, Mayer, and Renneboog, 2001) and Japan (Kang and Shivdasani, 1995).

4.2 Governance factors and the level of ex-post losses and ex-ante risk taking

We test our H2 hypotheses on corporate governance and risk taking by first examining whether shareholder losses during the crisis are related to corporate governance mechanisms. If boards or investors have put pressure on firms to focus on short-term profits and as a result encouraged managers to increase investment in risky

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assets, we expect these factors to be associated with larger shareholder losses during the crisis. Our regression model is as follows:

$$Ex\text{-}post\ shareholder\ losses = \alpha_0 + \beta_1(Corporate\ governance) + \beta_2(Firm\ size) + \varepsilon \qquad (2)$$

We use two proxies for shareholder losses: (1) accounting writedowns, and (2) stock returns.[16] In contrast to our CEO turnover tests, we now measure cumulative shareholder losses from the first quarter of 2007 until the third quarter of 2008 for all firms in our sample. As in our previous analysis, we control for firm size and include industry and country dummies.

Panel A of Table 4 shows the results of regressing ex-post losses on the corporate governance factors. We find that board independence and institutional ownership are associated with larger shareholder losses during the crisis, for both in terms of larger accounting writedowns (column (1)) and for institutional investors also in terms of stock returns (column (5)). This evidence is consistent with hypothesis H2a that pressure from outside directors and investors has encouraged managers to make larger investments in risky assets that have lead to greater losses during the crisis.

Next, we examine the effect of corporate governance on the risk exposure of financial firms before the crisis (ex-ante risk taking). We test whether independent directors and outside investors curbed or increased risk taking by estimating the following model:

$$Ex\text{-}ante\ risk\ taking = \alpha_0 + \beta_1(Corporate\ governance) + \beta_2(Firm\ size) + \varepsilon \qquad (3)$$

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[16] We do not include capital raisings as a measure of shareholder losses in this test because the effect is ambiguous. While the need to raise capital is an indication of significant shareholder losses during the crisis period, a significantly positive coefficient on corporate governance can also be interpreted as boards or investors providing a monitoring role by pushing firms to line up financing to prepare for the credit crunch.

We use two measures to capture ex-ante risk taking: equity-to-assets ratio (which corresponds to capital adequacy ratios for banks) and expected default frequency (probability the firm will default within one year) as measured at the end of 2006. We control for firm size by including the log of total assets. As in our previous analysis on CEO turnover, we include country and industry dummies.

Panel B of Table 4 presents the results of regressing ex-ante risk taking on the corporate governance factors. It shows that firms with greater institutional ownership are associated with higher default risk (column (5)). However, inconsistent with our prediction, column (1) of this panel shows that firms with more independent boards are associated with higher equity-to-assets ratios (i.e., lower leverage). This finding suggests that directors, likely due to the threat of lawsuits and reputational penalties, curbed the type of risk taking that was observable to market participants.

Overall, the results suggest that outside board members and investors failed, at least partially, to curb risk taking before the crisis.

4.3 CEO pay structure and the level of ex-post losses and ex-ante risk taking

Finally, we examine the role of CEO pay, a crucial governance mechanism. We test the H3 hypotheses on whether ex-post shareholder losses and ex-ante risk taking are related to the incentive structure of CEOs' compensation packages by estimating the following models:

Ex-post shareholder losses $= \alpha_0 + \beta_1(Pay\ structure) + \beta_2(Firm\ size) + \varepsilon$ *(4)*

Ex-ante risk taking $= \alpha_0 + \beta_1(Pay\ structure) + \beta_2(Firm\ size) + \varepsilon$ *(5)*

We measure pay structure as total incentive pay, as well as its components: bonus (cash awards based on yearly performance) and equity compensation (restricted shares, LTIP and stock option awards). All variables are measured using 2006 data. We also control for firm size and include country and industry dummies.

Panel A of Table 4 reports the results of ex-post shareholder losses regressions. Column (2) shows that firms with CEO pay packages that rely more on incentive pay experienced smaller accounting writedowns. When we split incentives into bonuses and equity compensation, we find that while equity compensation is associated with smaller writedowns and higher stock returns, bonuses are associated with lower stock returns (columns (3) and (7)).

Panel B of Table 4 reports the results of ex-ante risk taking regressions. Columns (3) and (7) show that CEO compensation structures that focus on bonuses, as opposed to equity incentives, are associated with more risk taking (low equity-to-assets ratios and high expected default risk) before the onset of the crisis.

We note that we draw our main conclusion on the effect of pay structure on risk taking by examining this factor separately (that is, without including corporate boards and ownership). This is because CEO compensation is a key corporate control mechanism set by boards and we are interested in how pay structure is associated with risk taking, not its incremental effect conditional on board composition. For completeness of the analysis, Table 4 also reports a full model including both our corporate governance and pay structure measures as independent variables. The results on pay structure are similar, except that the coefficient on bonus pay becomes insignificant in Panel B of Table 4 (ex-ante risk taking) after including board independence and ownership structure.

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4.4 Additional analyses

One underlying assumption of hypotheses H2 and H3 is that pressure to increase risk taking was driven by efforts to maximize short-term performance. To provide corroborating evidence on this assumption, we investigate whether there is indeed an association between ex-ante performance and the governance mechanisms over the period before the crisis. Specifically, we regress average *ROA* and *Cumulative stock returns,* measured over 2004-2006, on our corporate governance measures and control variables (firm size and country and industry fixed effects).[17] The analysis (results untabulated) finds that board independence and institutional ownership are positively associated with average ROA (two-tailed *p*-value < 5%). The analysis also finds that board independence is positively associated with cumulative stock returns before the crisis (two-tailed *p*-value < 5%).

In addition, we explore the differences between U.S. and non-U.S. firms because the 2007-2008 financial crisis originated in the U.S. and U.S. firms were often accused of excessive risk taking, despite that the U.S. was often perceived as having strong governance standards due to its legal institutions and recent regulatory changes such as the Sarbanes-Oxley Act of 2002. To test how U.S. firms differ from non-U.S. firms, we rerun our analyses after replacing the country-fixed effect with a dummy variable that equals 1 for U.S. firms, and equals 0 otherwise. For the CEO turnover test, our analysis (results untabulated) shows that the average interaction effect is positive and significant for the interaction of the U.S. dummy with capital raising and negative and significant for the interaction of the U.S. dummy with stock returns, suggesting that U.S. CEOs were

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[17] We do not regress ex-ante performance on pay structure because pay structure can be mechanically related to ex-ante performance such as ROA due to the design of compensation contracts.

more likely to be replaced for poor performance than their foreign counterparts. For the tests on risk taking, our analysis finds that U.S. firms have significantly higher ex-post losses in terms of writedowns but significantly lower risk taking before the crisis (both in terms of higher equity-to-assets ratio and lower expected default frequency). This finding suggests that although U.S. firms suffered larger losses during the crisis, they did not seem to take more risk before the crisis. [18]

5. Analysis on turnover of independent directors

This section examines whether losses during the crisis had negative repercussions for outside board members. The large losses at financial firms could have been perceived by investors as being caused by a lack of oversight by directors, and therefore could have repercussions for these directors, especially if they were responsible for overseeing risk management.[19] While some prior studies find that director turnover increases around corporate failure events (Gilson, 1990, Srinivasan, 2005), some do not find such an association (Agrawal, Jaffe, and Karpoff, 1999). If investors attribute the loss to a lack of oversight from outside directors, we expect that outside directors are more likely to leave boards of firms that experienced larger losses during the crisis, especially if they oversaw risk management. However, if investors attribute the losses to bad managerial decisions and view the role of directors as confined to replacing poorly performing CEOs, we do not expect such an association. Thus, it is an empirical question whether director turnover is related to the losses.

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[18] Our further analysis suggests that this finding is partially driven by cross-country variation in legal enforcement. In particular, we find that U.S. firms do not exhibit lower expected default if we include a country-level institutional measure on private enforcement (as captured by the disclosure requirements and liability standard in La Porta, Lopez-de-Silanes, and Shleifer, 2006).

[19] The SEC recently announced plans to investigate the performance of boards of financial firms leading up to the crisis ("SEC to Examine Board's Role in Financial Crisis", *Washington Post* February 20, 2009).

For director turnover, we use the data from *BoardEx* on board composition for the 306 financial firms in our sample. We concentrate on turnover of independent directors (i.e. not full-time employees) because their primary function is to discipline and monitor managers.

We run a logit model of independent board member turnover on shareholder losses, ownership structure and risk committee membership, and focus again on the interaction effect.[20] We estimate the following logit model:

$$\textit{Independent director turnover} = \alpha_0 + \beta_1 \textit{(Shareholder losses)} +$$
$$\beta_2 \textit{(Ownership structure)} + \beta_3 \textit{(Risk committee member)} +$$
$$\beta_4 \textit{(Shareholder losses * Ownership structure/Risk committee member)} +$$
$$\beta_5 \textit{(Age dummy 1)} + \beta_6 \textit{(Age dummy 2)} + \beta_7 \textit{(Firm size)} + \varepsilon \qquad (6)$$

The dependent variable is a dummy variable that equals 1 if an independent board member left the firm from January 2007 to December 2008.[21] Risk committee member is a dummy variable that equals 1 if a board member was a member of a board committee with a name that is suggestive of a responsibility related to the monitoring of risk (e.g., risk committee, investment committee).[22] We control for the age of directors (with a dummy variable that equals 1 if the age of a director is between 65-70 years old, and another dummy variable that equals 1 if the age of a director is greater than 70), firm size, and include country and industry dummies.

Table 5 presents the results on director turnover. Columns (1) to (3) show that independent directors are more likely to leave firms that experienced large shareholder

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[20] Some members of risk committees were among first board members to be replaced during the crisis. For example, Citigroup replaced its audit and risk committee chair following a shareholder campaign ("Citigroup Names New Board Committee Chairs", *RiskMetrics Group*, July 25, 2008).

[21] Similar to our CEO turnover analysis, we drop observations when directors remain on the board until their firm delists.

[22] We include committees with names containing words such as "risk" and "investment," but not "audit," because audit committees' primary responsibility is to oversee financial reporting.

losses. In addition, we find that director turnover is more sensitive to shareholder losses, as captured by stock returns, for firms with higher institutional ownership (column (6)) and less insider ownership (column (9)). These findings are consistent with institutional investors, as opposed to insiders, holding directors accountable for poor performance during the crisis. Finally, column (10) shows that the average interactive effect of *Member of risk committee* and writedowns is significantly negative, consistent with risk committee members being held more accountable for the losses.

6. Conclusions and policy implications

Our paper brings to light the importance of corporate governance in the financial crisis. We use a comprehensive dataset on 306 publicly listed financial firms from 31 countries that were at the center of the crisis. Our results show that while stronger external monitoring by boards and investors is associated with stronger disciplining of executives after the crisis began, it has unintended consequences on risk taking before the crisis. Specifically, we find that while independent boards and institutional shareholders are associated with greater CEO turnover-performance sensitivity, they are also associated with larger losses. Consistent with outside pressure for short-term profitability encouraging managers to take on more risk, which eventually lead to the losses, we find that firms with higher institutional ownership took more risk and experienced higher performance before the crisis. In addition, while we do not find evidence for firms with more independent boards taking more risk of the type that was readily observable to market participants before the crisis, we do find that these firms experienced higher performance before the crisis. Moreover, when we examine the role of CEO compensation we find further evidence for this short-term orientation. In particular, we

find that CEO compensation packages that rely more on annual bonuses, and less on long-term equity-based compensation are associated with greater losses during the crisis and higher risk taking before the crisis. Overall, our findings are consistent with a deficiency in corporate governance mechanisms having played a significant role in the financial crisis.

Our findings have several implications for the current policy debate on reforming the financial services industry. In terms of board composition, our results suggest that external monitoring by independent board members is important for disciplining top management for poor performance during the crisis. Therefore, it is important for regulators to keep this mechanism in place, as these "gate keepers" stepped in before governments intervened. However, our results suggest that the recent focus on board independence may have reduced the level of expertise on corporate boards which has made it difficult for the board to adequately monitor the risks that financial firms have taken. Our evidence suggests that independent directors seem to have pushed for higher performance and curbed risk taking as observable to market participants before the crisis. Ultimately, however, this external pressure has encouraged firms to invest in assets (e.g., mortgage-backed securities) that, though boosting performance in the short-term, produced significant losses during the crisis. Similarly, our findings suggest that pressure from institutional owners induced managers to focus on short-term performance, which resulted in an increase in risk taking that materialized into losses during the crisis. Naturally, our findings have to be interpreted with caution because the optimal level of risk taking is unknown and it may have been difficult for executives, boards, and investors to predict the collapse of the housing market.

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In terms of CEO compensation, our findings highlight that incentive compensation per se is not associated with losses in financial firms. In particular, we find that while annual bonuses are associated with larger losses and increased risk taking, long-term equity-based compensation is associated with smaller losses and less risk taking. This is consistent with some views criticizing the use of bonuses (e.g., Financial Services Authority, 2009), but not consistent with other views suggesting that equity-based incentive compensation plans also lead to higher risk taking (Bebchuk and Spamann, 2009). Our findings suggest that restructuring CEO bonuses such that some performance pay is held back until the full consequences of an investment strategy play out may induce managers to focus more on the long-term performance of their firms.

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Figure 1
CEO turnover rates for financial versus non-financial firms from 2004-2008
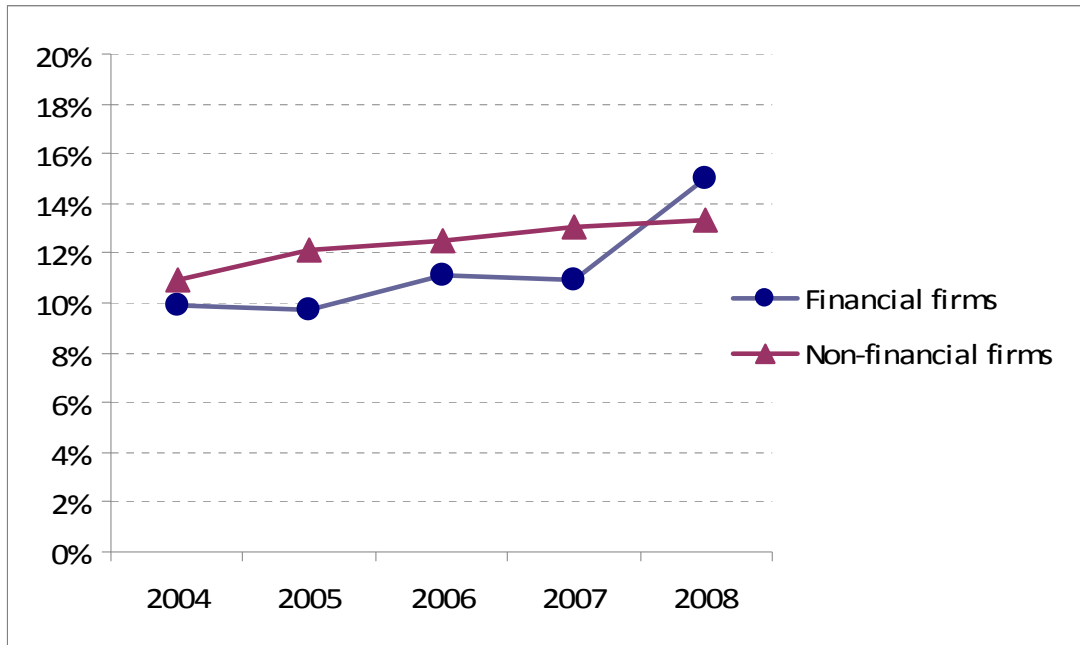
This figure presents CEO turnover rates for financial and non-financial firms worldwide, based on data from all firms in *BoardEx* with market capitalizations greater than US $100 million. Financial firms are defined as in our main sample. We classify a firm as having experienced turnover during a year when its top executive at the end of the year is different from the previous year.

Figure 2
Magnitudes of accounting writedowns per quarter during the 2007-08 crisis period
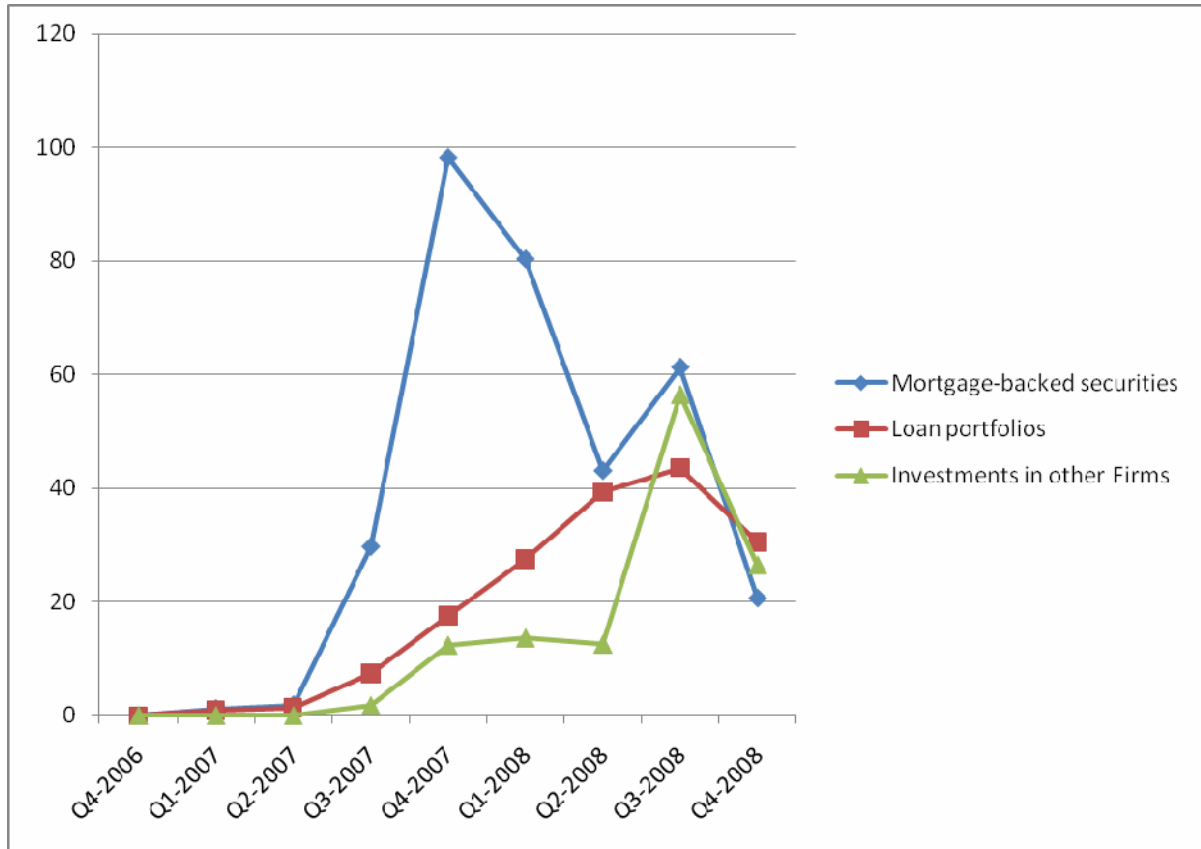
This figure plots the magnitudes of accounting writedowns (in US $billion) per quarter for all financial firms covered in Bloomberg by three categories: (1) losses associated with mortgage-backed securities ("CDO/CMBS/MTGE/SUB"), (2) losses related to loan portfolios ("COST"), and (3) losses related to investments in other firms ("CORP/OCI").

Table 1
Summary descriptive statistics by country
This table provides summary statistics per country on our sample of 306 financial firms. Panel A shows the frequency of CEO and director turnover, as well as average measures of shareholder losses during the crisis period. Panel B presents averages per country for our variables of interest in terms of governance and CEO pay structure. See Appendix A for variable definitions.

Panel A: Frequency of CEO turnover, director turnover and shareholder losses (by country)

Region	Country	N of firms	% CEO turnover [Q1/2007-Q4/2008]	% Director turnover [Q1/2007-Q4/2008]	N of writedowns [Q1/2007-Q3/2008]	Avg writedown [Q1/2007-Q3/2008]	N of capital raising [Q1/2007-Q3/2008]	Avg stock return [Q1/2007-Q3/2008]
America	United States	125	25%	19%	50	-4%	26	-32%
	Canada	13	8%	11%	7	-1%	3	0%
	Other America	9	13%	25%	4	-4%	1	-32%
	Sub-total America	*147*	*23%*	*18%*	*61*	*-4%*	*30*	*-29%*
Europe	United Kingdom	23	39%	33%	12	-1%	6	-45%
	Germany	19	28%	34%	9	-3%	3	-27%
	Italy	19	22%	32%	2	-0%	1	-31%
	Switzerland	15	27%	23%	7	-1%	3	-15%
	France	9	0%	18%	5	-0%	3	-29%
	Spain	9	11%	14%	1	-0%	1	-30%
	Greece	7	14%	20%	0	NA	0	-38%
	Netherlands	6	50%	42%	4	-1%	3	-26%
	Ireland	5	25%	36%	2	-0%	0	-56%
	Sweden	4	0%	28%	1	-0%	0	-36%
	Belgium	3	0%	22%	2	-0%	1	-37%
	Denmark	3	0%	9%	1	-0%	0	-41%
	Portugal	3	33%	34%	0	NA	0	-48%
	Other Europe	12	18%	27%	2	-0%	0	-38%
	Sub-total Europe	*137*	*23%*	*28%*	*48*	*-1%*	*21*	*-33%*
Other	Australia	15	36%	33%	3	-2%	2	-10%
	Other countries	7	29%	26%	1	-0%	0	9%
	Total	***306***	***24%***	***24%***	***113***	***-3%***	***53***	***-29%***

Table 1 (continued)
Panel B: Corporate governance and executive compensation (by country)

Region	Country	Avg board independence [Dec. 2006]	Avg institutional ownership [Dec. 2006]	Avg insider ownership [Dec. 2006[	Avg incentives (% of salary and other pay) [Dec. 2006]	Avg bonus (% of salary and other pay) [Dec. 2006]	Avg equity compensation (% of salary and other pay) [Dec. 2006]
America	United States	85%	73%	13%	800%	213%	587%
	Canada	87%	54%	8%	424%	99%	343%
	Other America	82%	.	18%	224%	98%	126%
Europe	United Kingdom	63%	25%	9%	333%	166%	167%
	Germany	71%	17%	63%	333%	210%	109%
	Italy	82%	11%	29%	994%	144%	870%
	Switzerland	92%	17%	33%	319%	198%	143%
	France	85%	23%	44%	384%	155%	229%
	Spain	75%	10%	36%	251%	130%	87%
	Greece	71%	13%	42%	.	.	.
	Netherlands	68%	28%	20%	205%	122%	82%
	Ireland	68%	25%	4%	295%	111%	184%
	Sweden	90%	37%	24%	.	25%	
	Belgium	78%	13%	48%	179%	107%	72%
	Denmark	83%	24%	18%	85%	13%	72%
	Portugal	71%	9%	44%	.	.	.
	Other Europe	77%	24%	45%	.	51%	.
Other	Australia	85%	11%	22%	841%	260%	346%
	Other countries	84%	28%	58%	.	27%	.
	Total	*81%*	*44%*	*24%*	*640%*	*185%*	*441%*

Table 2
Descriptive statistics
This table provides descriptive statistics for the variables used in our main analysis. Panel A provides descriptive statistics. Panel B provides a Spearman correlation matrix among all the variables, with p-values in parentheses. Panel C provides descriptive statistics on shareholder losses, partitioned on whether the firm experienced a CEO turnover. The last column in Panel C presents univariate tests with p-values for t-tests in mean for the continuous variables and chi-squared test in proportion for the dummy variable. See Appendix A for variable definitions.

Panel A: Summary statistics

Variable		N	Mean	Median	Std. dev.
Discipline	CEO turnover	285	24%	0%	43%
Losses (ex-post)	Writedown	306	-1%	0%	4%
	Capital raising	306	17%	0%	38%
	Stock returns	306	-29%	-28%	35%
Risk (ex-ante)	Equity-to-assets ratio	306	9%	7%	7%
	EDF	278	0.18%	0.04%	0.69%
Governance	Board independence	306	81%	85%	13%
	Institutional ownership	285	44%	33%	35%
	Insider ownership	274	24%	12%	27%
Compensation	Total incentives	199	640%	252%	1,883%
	Bonus	235	185%	86%	410%
	Equity compensation	199	441%	138%	1,766%
Controls	Firm size	306	11.20	10.94	1.44
	Age dummy	306	34%	0%	47%

Table 2 (continued)
Panel B: Correlation matrix

Variable		Discipline (Turnover)	Losses (ex-post)			Risk (ex-ante)		Governance			Compensation			Controls	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Writedown	(2)	-0.23 (0.00)													
Capital raising	(3)	0.20 (0.00)	-0.65 (0.00)												
Returns	(4)	-0.21 (0.00)	0.31 (0.00)	-0.32 (0.00)											
Equity-to-assets ratio	(5)	-0.14 (0.02)	0.08 (0.14)	-0.18 (0.00)	0.27 (0.00)										
EDF	(6)	0.07 (0.25)	0.12 (0.05)	-0.10 (0.11)	-0.10 (0.09)	-0.23 (0.00)									
Board independence	(7)	-0.04 (0.46)	-0.14 (0.01)	(0.07) (0.25)	(0.11) (0.05)	(0.24) (0.00)	-(0.10) (0.08)								
Institutional own.	(8)	0.03 (0.66)	-0.30 (0.00)	0.19 (0.00)	-0.17 (0.00)	0.35 (0.00)	-0.09 (0.14)	(0.20) (0.00)							
Insider own.	(9)	-0.04 (0.54)	0.30 (0.00)	-0.26 (0.00)	0.10 (0.10)	-0.04 (0.50)	0.17 (0.01)	-(0.11) (0.07)	-0.37 (0.00)						
Total incentives	(10)	0.05 (0.50)	-0.18 (0.01)	0.21 (0.00)	-0.05 (0.51)	0.01 (0.92)	-0.05 (0.51)	(0.01) (0.93)	0.18 (0.01)	-0.14 (0.07)					
Bonus	(11)	0.00 (0.96)	-0.15 (0.02)	0.13 (0.04)	-0.05 (0.49)	-0.09 (0.16)	0.05 (0.50)	-(0.18) (0.01)	0.09 (0.21)	-0.02 (0.75)	0.69 (0.00)				
Equity comp.	(12)	0.08 (0.27)	-0.23 (0.00)	0.23 (0.00)	-0.05 (0.51)	0.07 (0.32)	-0.11 (0.12)	(0.10) (0.14)	0.24 (0.00)	-0.26 (0.00)	0.89 (0.00)	0.42 (0.00)			
Firm size	(13)	0.13 (0.02)	-0.49 (0.00)	0.43 (0.00)	-0.17 (0.00)	-0.48 (0.00)	-0.11 (0.06)	-(0.04) (0.47)	-0.02 (0.78)	-0.18 (0.00)	0.34 (0.00)	0.26 (0.00)	0.32 (0.00)		
Age dummy	(14)	0.05 (0.41)	0.09 (0.13)	-0.02 (0.79)	0.07 (0.21)	0.01 (0.88)	-0.06 (0.31)	-(0.04) (0.53)	-0.07 (0.21)	0.05 (0.38)	-0.13 (0.07)	-0.12 (0.06)	-0.11 (0.12)	-0.01 (0.85)	

Table 2 (continued)
Panel C: Test of differences in shareholder losses between firms with and without CEO turnover

Variable	N	Mean	Std. dev.	Median	*p-value*
Writedown$_{-turnover}$					
CEO turnover	68	-2%	6%	0%	*0.00*
No CEO turnover	217	-0%	1%	0%	
Capital raising$_{-turnover}$					
CEO turnover	68	24%	43%	0%	*0.04*
No CEO turnover	217	13%	34%	0%	
Stock returns$_{-turnover}$					
CEO turnover	68	-26%	40%	-17%	*0.85*
No CEO turnover	217	-27%	31%	-26%	

Table 3

Logit regression of CEO turnover in financial firms on shareholder losses and corporate governance

This table presents logit regressions of CEO turnover in financial firms during the crisis period. The main variables of interest are the interaction between measures of shareholder losses and measures of corporate governance. Interaction effects are estimated as in Ai and Norton (2003). See Appendix A for variable definitions. Z-statistics based on robust standard errors clustered by country are reported in brackets. *,**,*** indicate significance at 10%, 5%, and 1% levels (two-tailed).

	Baseline regression			Gov=Board independence			Gov=Institutional ownership			Gov=Insider ownership		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Shareholder losses												
Writedown$_{turnover}$	-19.14***			-117.36			19.12			-60.36***		
	[-4.57]			[-1.27]			[0.57]			[-7.31]		
Capital raising$_{turnover}$		0.45			-7.88**			-1.68			-0.93	
		[0.74]			[-2.09]			[-1.12]			[-1.33]	
Stock returns$_{turnover}$			-0.05			10.87***			3.02***			-0.51
			[-0.05]			[3.44]			[3.24]			[-0.47]
Governance				1.67	0.56	-2.34	0.98	1.13	-0.07	0.10	-0.36	0.30
				[0.97]	[0.39]	[-1.09]	[1.30]	[1.32]	[-0.06]	[0.08]	[-0.37]	[0.23]
Interaction on losses and governance				125.30	9.30**	-13.19***	-30.35	2.58	-4.97***	274.13***	6.19	4.91*
				[1.18]	[2.09]	[-3.34]	[-0.88]	[1.36]	[-4.85]	[6.60]	[1.34]	[1.84]
Age dummy	0.29	0.28	0.26	0.58***	0.57***	0.59***	0.55**	0.51**	0.38*	0.50*	0.44*	0.33
	[1.53]	[1.45]	[1.27]	[3.01]	[2.92]	[2.91]	[2.51]	[2.17]	[1.94]	[1.82]	[1.75]	[1.40]
Firm size	0.17	0.13	0.19*	0.24*	0.34***	0.31**	0.25*	0.26**	0.30**	0.07	0.34**	0.20
	[1.42]	[1.39]	[1.71]	[1.67]	[2.69]	[2.50]	[1.76]	[1.98]	[2.06]	[0.39]	[2.24]	[1.07]
Country fixed effects	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry fixed effects	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
N	285	285	285	223	223	223	207	207	207	197	197	197
Pseudo R-squared	0.05	0.02	0.02	0.12	0.13	0.14	0.14	0.15	0.17	0.17	0.15	0.15
Predicted sign					.			.			.	
Average interactive effect				19.81	1.35*	-2.08**	-4.76	0.32	-0.75***	45.02***	0.94	0.82
				[1.05]	[1.76]	[-2.49]	[-1.09]	[1.24]	[-2.87]	[3.97]	[1.21]	[1.43]

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Table 4
Regression of ex-post losses and ex-ante risk taking on corporate governance and CEO compensation policy
This table presents the results of regressing ex-post losses and ex-ante risk taking on measures of corporate governance and compensation structure. Panel A uses two proxies of ex-post losses (accounting writedowns and stock returns) measured between January 2007 and September 2008. Panel B uses two proxies of ex-ante measures of risk taking (equity-to-assets ratio and expected default frequency) measured in December 2006. See Appendix A for variable definitions. Z-statistics based on robust standard errors clustered by country are reported in brackets. *,**,*** indicate significance at 10%, 5%, and 1% levels (two-tailed).

Panel A: Ex-post losses

	Pred. sign	Writedown[Q1/2007-Q3/2008]				Stock returns [Q1/2007-Q3/2008]			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Board independence	-	-0.05*			-0.08**	-0.09			-0.12
		[-1.76]			[-2.56]	[-0.55]			[-0.41]
Institutional ownership	-	-0.01**			-0.01***	-0.32***			-0.30***
		[-2.75]			[-6.79]	[-6.28]			[-4.99]
Insider ownership	+	0.00			-0.00	0.08			0.10
		[0.60]			[-0.44]	[0.82]			[0.86]
Total incentives	?		0.00***				0.00		
			[4.73]				[0.95]		
Bonus	-			0.00	-0.00***			-0.01***	-0.02***
				[0.97]	[-4.01]			[-5.88]	[-4.19]
Equity compensation	+			0.00***	0.00***			0.00**	0.00***
				[5.80]	[10.25]			[2.37]	[6.06]
Firm size		-0.00	-0.01***	-0.01***	-0.01***	-0.02	-0.04**	-0.03**	-0.02
		[-1.29]	[-3.92]	[-3.85]	[-7.85]	[-1.52]	[-3.25]	[-3.45]	[-1.48]
Country fixed effects		yes	yes	yes	yes	yes	yes	yes	yes
Industry fixed effects		yes	yes	yes	yes	yes	yes	yes	yes
N		268	199	199	174	268	199	199	174
Adjusted R-squared		0.25	0.31	0.31	0.32	0.24	0.16	0.17	0.20

Table 4 (continued)
Panel B: Ex-ante risk taking

	Pred. sign	Equity-to-assets ratio [Dec. 2006]				Pred. sign	logEDF [Dec. 2006]			
		(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
Board independence	-	0.08**			0.13***	+	-0.15			-1.89*
		[2.49]			[4.29]		[-0.12]			[-2.00]
Institutional ownership	-	-0.01			-0.01	+	0.69**			0.73***
		[-0.61]			[-1.51]		[2.62]			[4.22]
Insider ownership	+	-0.00			-0.01	-	0.56			1.13**
		[-0.27]			[-1.48]		[1.54]			[2.22]
Total incentives	?		0.00***			?		-0.00***		
			[5.49]					[-3.10]		
Bonus	-			-0.00**	0.00	+			0.03**	0.01
				[-2.45]	[0.31]				[2.42]	[0.41]
Equity compensation	+			0.00***	0.00***	-			-0.01***	-0.01***
				[9.04]	[9.17]				[-7.93]	[-17.18]
Firm size		-0.01***	-0.01***	-0.01**	-0.01***		-0.19**	-0.23***	-0.24***	-0.17***
		[-4.15]	[-3.59]	[-2.76]	[-3.84]		[-2.64]	[-4.95]	[-5.28]	[-3.63]
Country fixed effects		yes	yes	yes	yes		yes	yes	yes	yes
Industry fixed effects		yes	yes	yes	yes		yes	yes	yes	yes
N		268	199	199	174		246	186	186	163
Adjusted R-squared		0.55	0.60	0.60	0.58		0.17	0.29	0.29	0.26

Table 5

Logit models of turnover of independent board members

This table presents logit regressions of independent board member turnover in financial firms during the crisis period. The unit of observation is each board director. Interaction effects are estimated as in Ai and Norton (2003). See Appendix A for variable definitions. Z-statistics based on robust standard errors clustered by country are reported in brackets. *,**,*** indicate significance at 10%, 5%, and 1% levels (two-tailed).

	Baseline regression			Own=Institutional ownership			Own=Insider ownership			Member of risk committee		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Shareholder losses												
Writedown	-5.22***			-6.65***			-5.00***			-5.96***		
	[-2.85]			[-3.94]			[-3.54]			[-5.81]		
Capital raising		0.24*			-0.04			0.10			0.44**	
		[1.68]			[-0.10]			[0.34]			[2.28]	
Stock returns			-0.85***			0.68			-0.96			-0.35
			[-2.86]			[1.11]			[-1.16]			[-0.66]
Ownership structure				-0.43	-0.52*	-1.25***	0.57	0.52	1.05			
				[-1.29]	[-1.68]	[-3.35]	[1.17]	[1.03]	[1.42]			
Interaction on losses and ownership structure				1.54	0.79*	-2.39***	-2.09	1.18	2.08**			
				[0.51]	[1.82]	[-3.55]	[-0.52]	[1.12]	[2.20]			
Member of risk committee										0.17	0.33**	0.11
										[1.25]	[2.21]	[0.57]
Interaction on losses and risk committee member										-12.41***	-0.07	-0.51
										[-3.01]	[-0.22]	[-1.21]
Age dummy 1	0.18	0.20	0.23	0.33**	0.35**	0.37**	0.31*	0.32**	0.34**	0.32**	0.32**	0.32**
	[1.10]	[1.25]	[1.42]	[1.98]	[2.21]	[2.22]	[1.85]	[2.02]	[2.09]	[2.07]	[2.17]	[2.09]
Age dummy2	0.94***	0.93***	0.97***	1.10***	1.11***	1.10***	1.06***	1.05***	1.07***	1.15***	1.12***	1.13***
	[5.47]	[5.38]	[4.95]	[5.08]	[5.06]	[4.70]	[4.71]	[4.66]	[4.14]	[5.04]	[5.06]	[4.71]
Firm size	0.13*	0.09	0.10	0.13***	0.07	0.13***	0.16**	0.13	0.14**	0.07	0.03	0.09*
	[1.76]	[1.14]	[1.43]	[2.68]	[1.64]	[2.84]	[2.07]	[1.60]	[2.01]	[1.59]	[0.60]	[1.76]
Country fixed effects	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry fixed effects	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
N	3,107	3,107	3,107	2,914	2,914	2,914	2,783	2,783	2,783	3,080	3,080	3,080
Pseudo R-squared	0.03	0.02	0.03	0.08	0.07	0.08	0.08	0.08	0.08	0.09	0.08	0.08
Average interactive effect				0.44	0.13	-0.37**	-0.58	0.23	0.33**	-2.21***	-0.00	-0.10
				[1.36]	[1.63]	[-2.80]	[-0.78]	[1.24]	[2.23]	[-3.28]	[-0.05]	[-1.37]

Appendix A
Variable definitions

Variables	Definitions	Measurement period	Data sources
Discipline			
CEO turnover	A dummy variable equal to 1 if a CEO departs the firm, and 0 otherwise	January 2007 – December 2008	BoardEx
Director turnover	A dummy variable equal to 1 if a independent board member departs the firm, and 0 otherwise	January 2007 – December 2008	BoardEx
Losses (ex-post)			
Writedown	Cumulative accounting writedowns scaled by total assets	January 2007 - September 2008	Bloomberg/ Compustat
Capital raising	A dummy variable equal to 1 if a firm raises capital, and 0 otherwise	January 2007 - September 2008	Bloomberg
Stock returns	Cumulative stock returns	January 2007 - September 2008	Compustat/ CRSP
Writedown$_{turnover}$	Cumulative accounting writedowns scaled by total assets	1Q/ 2007 until the earlier of the quarter of the CEO's departure or the end of the sample period (3Q/ 2008)	Bloomberg/ Compustat
Capital raising$_{turnover}$	A dummy variable equal to 1 if a firm raises capital, and 0 otherwise	1Q/ 2007 until the earlier of the quarter of the CEO's departure or the end of the sample period (3Q/ 2008)	Bloomberg
Stock returns$_{turnover}$	Cumulative stock returns	1Q/ 2007 until the earlier of the quarter of the CEO's departure or the end of the sample period (3Q/ 2008)	Compustat/ CRSP
Risk taking (ex-ante)			
Equity-to-assets ratio	Book value of equity scaled by total assets	December 2006	Compustat
EDF	Expected Default Frequency	December 2006	Moody's KMV
Performance (ex-ante)			
Average ROA	Average income before extraordinary item scaled by total assets	2004-2006	Compustat
Stock returns	Cumulative stock returns	2004-2006	Compustat/ CRSP

Appendix A (continued)

Variables	Definitions	Measurement period	Data sources
Governance			
Board independence	Percentage of directors whose primary affiliation is not with the firm	December 2006	BoardEx
Institutional ownership	Percentage of shares owned by institutional investors	December 2006	FacSet/ Lionshares
Insider ownership	Percentage of shares owned by insiders	December 2006	Worldscope
CEO compensation			
All incentives	All incentives (bonus + equity compensation) scaled by the sum of salary and other compensation	December 2006	BoardEx/ SEC
Bonus	Annual bonus (excluding restricted shares) scaled by the sum of salary and other compensation	December 2006	BoardEx/ SEC
Equity compensation	Sum of options, LTIP, and restricted shares scaled by the sum of salary and other compensation	December 2006	BoardEx/ SEC
Controls			
Firm size	Natural logarithm of total assets (in US $million)	December 2006	Compustat
Age dummy	A dummy variable equal to 1 when the CEO is 60 years or older, and 0 otherwise	December 2006	BoardEx
Age dummy 1	A dummy variable equal to 1 when the director's age is larger than 65 but smaller than 70, and 0 otherwise	December 2006	BoardEx
Age dummy 2	A dummy variable equal to 1 when the director is 70 years or older, and 0 otherwise	December 2006	BoardEx

Appendix B
CEO information and shareholder losses for the top ten financial firms in selected countries

Country	Rank	Total assets	Company name	CEO name	Date of departure	Write down (Q1/2007-Q3/2008)	Capital raising (Q1/2007-Q3/2008)	Stock return (Q1/2007-Q3/2008)
U.S.	1	1,884	CITIGROUP	C. Prince III	31-Dec-07	-3.6%	1	-60%
	2	1,460	BANK OF AMERICA	K. Lewis		-1.9%	1	-27%
	3	1,352	JP MORGAN CHASE	J. Dimon		-1.5%	1	2%
	4	1,121	MORGAN STANLEY	J. Mack		-1.4%	1	-65%
	5	979	AIG	M. Sullivan	1-Jul-08	-6.2%	1	-95%
	6	844	FANNIE MAE	D. Mudd	29-Sep-08	-6.6%	1	-97%
	7	841	MERRILL LYNCH	S. O'Neal	30-Oct-07	-6.6%	1	-72%
	8	838	GOLDMAN SACHS	L. Blankfein		-0.6%	1	-35%
	9	813	FREDDIE MAC	R. Syron	7-Nov-08	-7.2%	1	-97%
	10	707	WACHOVIA	G. Thompson	1-Jun-08	-7.3%	1	-93%
U.K.	1	1,952	BARCLAYS	J. Varley		-0.4%	1	-52%
	2	1,861	HSBC	S. Green		-1.6%	1	-3%
	3	1,707	RBS	F. Goodwin		-0.9%	1	-64%
	4	1,157	HBOS	A. Hornby		-1.1%	1	-88%
	5	673	LLOYDS TSB	J. Daniels		-0.8%	1	-57%
	6	573	AVIVA	R. Harvey	11-Jul-07	-0.0%	0	-35%
	7	426	LEGAL & GENERAL	T. Breedon		-0.0%	0	-30%
	8	424	PRUDENTIAL	M. Tucker		-0.2%	0	-30%
	9	266	STANDARD CHARTERED	P. Sands		-0.2%	0	-4%
	10	260	STANDARD LIFE	A. Crombie		-0.0%	0	-11%
Germany	1	1,486	DEUTSCHE BANK	J. Ackermann		-0.8%	1	-40%
	2	1,390	ALLIANZ SE	M. Diekmann		-0.3%	1	-28%
	3	802	COMMERZBANK	K. Müller		-0.4%	0	-61%
	4	670	HVB (<09/2008)	W. Sprissler		-0.1%	0	30%
	5	296	EUROHYPO (<07/2008)	B. Knobloch		-0.0%	0	30%
	6	285	MUNCHENER RE	N. van Bomhard		-0.0%	0	-10%
	7	244	DEUTSCHE POSTBANK	W. Schimmelmann	30-Jun-07	-0.0%	0	-56%
	8	213	HYPO REAL ESTATE	G. Funke	7-Oct-08	-2.5%	0	-91%
	9	187	LANDESBANK BERLIN	H. Vetter		-0.1%	0	-54%
	10	164	ERGO V AG	L. Meyer		-0.0%	0	-12%
Switzerland	1	1,965	UBS	M. Ospel	23-Apr-08	-2.5%	1	-67%
	2	1,031	CREDIT SUISSE	O. Grübel	4-May-07	-1.3%	1	-26%
	3	374	ZURICH FIN	J. Schiro		-0.2%	0	1%
	4	239	SWISS RE	J. Aigrain		-1.6%	0	-37%
	5	153	SWISS LIFE	R. Dorig		-0.3%	1	-43%
	6	67	ACE	E. Greenberg		-0.8%	0	-8%
	7	52	BALOISE	R. Schauble	6-Dec-07	-0.1%	0	-34%
	8	29	JULIUS BAER	J. de Gier		-0.0%	0	-18%
	9	26	HELVETIA	E. Walser		-0.0%	0	-24%
	10	14	NEUE AARGAUER	H. Käppeli		-0.0%	0	2%
France	1	1,901	BNP PARIBAS	B. Prot		-0.3%	0	-13%
	2	1,663	CREDIT AGRICOLE	G. Pauget		-0.5%	1	-46%
	3	1,263	SOCIETE GENERALE	D. Bouton		-0.6%	1	-46%
	4	960	AXA	H. de Castries		-0.0%	0	-12%
	5	605	NATIXIS	D. Ferrero		-0.7%	1	-82%
	6	347	CNP ASSURANCES	G. Benoist		-0.1%	0	1%
	7	283	CIC	M. Lucas		-0.0%	0	-63%
	8	153	AGF (<07/2007)	J. Thierry		-0.0%	0	9%
	9	25	SCOR	D. Kessler		-0.0%	0	-4%
	10	-	-	-		-	-	-

Appendix C
Firm governance measures for the top five financial firms in selected countries

Country	Rank	Company name	Independent board	Institutional ownership	Insider ownership
U.S.	1	CITIGROUP	88%	84%	0.5%
	2	BANK OF AMERICA	89%	76%	0.9%
	3	JP MORGAN CHASE	80%	88%	0.6%
	4	MORGAN STANLEY	75%	85%	12.9%
	5	AIG	87%	85%	13.8%
U.K.	1	BARCLAYS	65%	24%	2.6%
	2	HSBC HLDGS	84%	26%	0.2%
	3	RBS	65%	30%	0.0%
	4	HBOS	60%	21%	0.1%
	5	LLOYDS TSB	57%	27%	0.0%
Germany	1	DEUTSCHE BANK	77%	49%	0.1%
	2	ALLIANZ SE	52%	39%	0.0%
	3	COMMERZBANK	69%	35%	0.0%
	4	HYPO REAL ESTATE (<09/08)	55%	4%	93.9%
	5	EUROHYPO (<07/08)	67%	0%	98.0%
Switzerland	1	UBS	83%	39%	0.0%
	2	CREDIT SUISSE	92%	30%	0.0%
	3	ZURICH FIN	100%	25%	0.1%
	4	SWISS RE	83%	27%	9.1%
	5	SWISS LIFE	100%	29%	0.1%
France	1	BNP PARIBAS	93%	48%	5.8%
	2	CREDIT AGRICOLE	96%	18%	55.3%
	3	SOC GENERALE	81%	47%	7.4%
	4	AXA	70%	59%	14.4%
	5	NATIXIS	83%	5%	68.9%

Appendix D
CEO compensation (in US$000s) of the top five financial firms from selected countries

Country	Rank	Company name	CEO name	Salary+ other pay	Bonus[a]		Options+ LTIP+ restricted shares	
				(1)	(2)	(2)/(1)	(3)	(3)/(1)
U.S.	1	CITIGROUP	C. Prince III	1,396	13,200	946%	11,380	815%
	2	BANK OF AMERICA	K. Lewis	4,708	6,500	138%	16,666	354%
	3	JP MORGAN CHASE	J. Dimon	1,534	13,000	847%	24,519	1,598%
	4	MORGAN STANLEY	J. Mack	1,143	0	0%	40,227	3,518%
	5	AIG	M. Sullivan	1,979	10,125	512%	9,125	461%
U.K.	1	BARCLAYS	J. Varley	1,662	3,161	190%	3,556	214%
	2	HSBC HLDGS	S. Green	2,320	3,430	148%	4,604	198%
	3	RBS	F. Goodwin	2,422	5,409	223%	2,232	92%
	4	HBOS	A. Hornby	1,899	1,188	63%	3,196	169%
	5	LLOYDS TSB	J. Daniels	1,937	2,853	147%	6,297	325%
Germany	1	DEUTSCHE BANK	J. Ackermann	1,718	10,693	622%	5,327	310%
	2	ALLIANZ SE	M. Diekmann	2,131	2,923	137%	4,708	221%
	3	COMMERZBANK	K. Müller	1,703	3,596	211%	305	18%
	4	HVB (<09/08)	W. Sprissler	.	.	.	.	.
	5	EUROHYPO (<07/08)	B. Knobloch	708	1,479	209%	95	13%
Switzerland	1	UBS	M. Ospel	1,941	8,633	445%	4,950	255%
	2	CREDIT SUISSE	O. Grübel	.	.	.	.	.
	3	ZURICH FIN	J. Schiro	.	.	.	.	.
	4	SWISS RE	J. Aigrain	1,303	6,601	507%	.	.
	5	SWISS LIFE	R. Dorig	2,031	1,281	63%	435	21%
France	1	BNP PARIBAS	B. Prot	1,338	3,055	228%	5,174	387%
	2	CREDIT AGRICOLE	G. Pauget	1,398	854	61%	1,205	86%
	3	SOC GENERALE	D. Bouton	1,694	3,023	178%	6,002	354%
	4	AXA	H. de Castries	912	3,512	385%	8,887	974%
	5	NATIXIS	D. Ferrero	883	439	50%	0	0%

[a]Excluding restricted shares